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ORIGINAL RESEARCH ARTICLE

# Patient Perspectives on Utilizing a Mobile Medical Clinic in Rural Philippine Communities

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**Background:** As far as authors know, ABC for Global Health, Medical Mobile Clinic (ABC-MMC) is the first mobile primary healthcare program emphasizing continuity of care in low-income rural Philippine barangays that (1) addresses the lack of healthcare services and (2) focuses on chronic disease prevention and management.

**Purpose:** The purpose of the ABC-MMC is to (1) provide primary healthcare services and (2) prevent and manage hypertension and type 2 diabetes in underserved rural villages (barangays) in Pampanga Province, Philippines. The aims of this study were: (1) to evaluate patient perceptions regarding ABC-MMC's healthcare services and (2) understand the barriers to and facilitators for patient engagement in ABC-MMC.

**Methods:** This was an exploratory qualitative study conducted in November 2021 using open-ended, semi-structured focus group interviews. Participants enrolled in ABC-MMC were recruited from 6 of the 18 barangays served by ABC-MMC. Community health workers (CHWs) recruited from each barangay were instructed on how to facilitate focus groups. Focus group interviews were digitally recorded and open coding methods were used to analyze the resulting data.

**Results:** Six focus groups were conducted with $N = 57$ adult Filipino participants (28.1% male, 71.9% female). Overall, mean age was 61 years. A majority had hypertension (84.2%), while 42.1% had type 2 diabetes. Mean duration for patient-enrollment in ABC-MMC was 2.3 years. Four major focus group themes emerged: (1) barriers for access to healthcare, (2) facilitators for accessing healthcare, (3) positive perceptions toward ABC-MMC, and (4) varying health literacy levels.

**Conclusion:** This study found that the ABC-MMC was well-received by rural Filipino communities. Moreover, barriers and facilitators were identified to inform how best to promote engagement in ABC-MMC services and improve health outcomes in low-income underserved rural Philippine barangays.

**Key Words:** mobile medical clinic ▪ non-communicable diseases ▪ hypertension ▪ type 2 diabetes ▪ patient perspective ▪ rural communities ▪ Philippines ▪ global health

Non-communicable diseases (NCDs) such as hypertension and type 2 diabetes are a substantial cause of disease burden in the Philippines, accounting for 70% of the 600,000 annual deaths nationwide.[1] Additionally, NCD case incidence is projected to double by 2040, with the number of Filipinos with hypertension increasing from 14 to 30 million. Impoverished Filipino communities are disproportionately affected by NCDs due to many factors e.g., globalization, economics, provider shortages, environmental issues, and limited education.[2,3]

For example, globalization has led to a marked nutrient deficiency in the Filipino population because of increased consumption of an ultra-processed, high fat and sodium diet, including refined carbohydrates and sugary foods.[4,5] In the last three decades, prevalence of infectious diseases and maternal and child health conditions have declined while NCDs have increased. This is due to changes in Philippine socio-demographics including increasing poverty levels and an aging population that is more susceptible to illness.

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## POPULAR SCIENTIFIC SUMMARY

- ABC-MMC stands out as possibly the inaugural mobile primary healthcare initiative in rural Philippine communities (barangays), concentrating on continuity of care, prevention, education, and management of chronic diseases.
- Despite numerous challenges to chronic disease care—ranging from modifiable factors such as deficiencies in health literacy to uncontrollable aspects such as weather, work and family obligations, financial constraints, and geographical barriers—ABC-MMC makes a notable impact.
- The use of trained community health workers (CHWs) is central to the success of ABC- MMC, as CHWs are instrumental in offering culturally sensitive care, continuous patient education on health upkeep and medication compliance, alongside providing patient appointment reminders and clinical assistance.

Historically, the Philippine health system has focused on reducing infectious diseases and improving maternal and child health.[3] Their needed treatments are often limited in scope and duration, whereas treatments for NCDs require broader and longer-term interventions. Interventions may include regular physician consultations and laboratory tests to boost continuity of care; and health education to promote healthy lifestyle changes to improve health outcomes.

Unfortunately, the Philippines has been unable to effectively address this dynamic shift in disease burden. The devolution of the Philippines healthcare system to local government units has further contributed to healthcare disparities due to fragmented healthcare delivery and variability in healthcare provisions and priorities.[2] This fragmented system relies on overburdened, underfunded provincial and municipal government agencies to deliver healthcare. Moreover, a provincial as opposed to centralized national public healthcare system, makes integrated care difficult, limits access, and compels patients' reliance on private practice healthcare, an alternative that few can afford. Because of NCD-related complications that increase medical costs, low-income families are often forced into poverty due to out-of-pocket expenses, inability to work, and lost wages.[3]

Currently, the Philippines is embarking on major health reforms via the Universal Health Care (UHC) Act of 2019.[2] The UHC Act is intended to protect and improve Filipino health by shifting to a primary-care model. Despite the increase in government funding, a provider shortage continues to limit access to modern healthcare, especially in rural communities. Until appropriate rural medical infrastructures are established, there will be a continued reliance on private practice healthcare, resulting in patients' high out-of-pocket medical expenditures and inequitable healthcare for the underserved low-income populations.[6]

Thus, to help bridge the gap in healthcare access, mitigate rising healthcare costs and improve health outcomes for Filipinos, ABC's for Global Health was founded in 2009.[7] It started by establishing relationships with Philippine local governments and community health assessments. Then, in late 2016, the first ABC for Global Health, Medical Mobile Clinic (ABC-MMC) was launched. The primary goal of ABC-MMC is to provide access to healthcare services, treatment for acute and chronic diseases, health education, and prevention research.

ABC-MMC serves 18 low-income rural Philippine villages (barangay) and a provincial jail in the province of Pampanga, providing routine monthly medical services and access to low-cost medications.[7] AG, MD serves as the full-time ABC-MMC Medical Director in the Philippines and is affiliated with the University of the Philippines (UP). The current source of funding is primarily philanthropic in tandem with several local university partnerships. The vision is to scale up the ABC-MMC model with public and private partnerships.

ABC-MMC is in its sixth year providing health services to the Pampanga communities with limited access to healthcare services.[7] ABC-MMC utilizes a community engagement and capacity building framework using local community health workers (CHWs),[8] who are trusted leaders in the community, know the culture, and speak the language.[9] Prior research suggests that utilizing CHWs with primary care interventions can reduce maternal, child, and neonatal mortality in low- and middle-income countries.[2]

Furthermore, ABC-MMC addresses the healthcare provider shortage by implementing mobile medical clinics to facilitate access to healthcare services, including remote telehealth visits via mobile phones to enhance rural community outreach.[7] Moreover, to improve health outcomes in these underserved low-income rural communities, the ABC-MMC program provides preventative health education such as promoting healthy eating, endorsing physical activity, and encouraging self-management for hypertension and type 2 diabetes.

The purpose of this article is to report on focus group interviews regarding patients' perceptions about their healthcare experiences provided by ABC-MMC. The overall goal of these focus group interviews was to understand the barriers to and facilitators for patient engagement with ABC-MMC. Results will inform how best to improve patients' healthcare services and community engagement with an overarching goal to improve health outcomes.

# METHODS

## Research design

This study was an exploratory qualitative study design using open-ended, semi-structured focus group interviews. The overall study goal was to better understand

(1) how to improve ABC-MMC medical and health education services for medically underserved low-income rural Filipino populations and (2) how to promote community engagement in ABC-MMC. A convenience sample of 6 out of 18 barangays served by ABC-MMC were selected to participate in the study. Study participants (i.e. patients enrolled with ABC-MMC at these barangay) were selected for their availability and interest in participation.

This study took place in November 2021. Stanford University approved study protocols and IRB approval was obtained (IRB-61926). Written informed consents were obtained prior to study participation. As specified in the consent form, there was no compensation provided for participants.

## Setting and participants

Six in-person focus groups in six barangays located in Pampanga Province, Philippines were conducted at either ABC-MMC headquarters or at easily accessible barangay community centers. Focus group sizes ranged from 6 to 12 participants, with each focus group lasting approximately 60 min.

Participants' eligibility included: male or female, ≥18 years of age; known diagnosis of either hypertension or type 2 diabetes, or both; enrolled ABC-MMC patients with documented attendance of at least two separate clinic appointments; literacy in Filipino or Kapampangan; and the ability to communicate in English, Filipino, or Kapampangan. AG, the ABC-MMC medical director (fluent in English, Filipino, and Kapampangan) was present at all focus groups to assist the local CHW conducting the interviews. Other research staff participated remotely via Zoom (zoom.us).

## Recruitment

Participants were recruited by AG from the study barangays via text messaging and word-of-mouth at clinic appointments. All participants were informed of the focus group date, time, and location (at their respective barangay).

## Data collection

Research study consultants and AG trained the CHW from each barangay on study protocols, research confidentiality, and proper methods for collecting, storing, and managing participants' data. Training included how to facilitate and manage focus group interviews, engaging study participants during focus group interviews, and reminding participants about date, time, and location of the focus groups.

In-person focus groups interviews were digitally recorded on a secure, confidential Zoom meeting platform (zoom.stanford.us) using encrypted, password-protected computers. This enabled the principal investigator and research study consultants to observe and participate remotely. All digital recordings were downloaded and stored on secure password-protected computers. After downloading, digital recordings were erased. Hardcopy data were stored by the principal investigator and medical director in locked, secure data file cabinets. Only authorized research staff had access to the data. Please contact the corresponding author for focus group interview guide questions.

## Data analysis

Transcriptions of the focus group interviews were translated from Filipino into English by one member of the research staff (AG). Themes of research were obtained using qualitative open coding methods based on grounded theory.[10] Two research staff (AG, HW) were trained in qualitative data analysis by a qualitative research expert on open coding (MB). These two trained research staff independently applied open coding to identify unique categories and concepts relevant to the analysis of ABC-MMC. Following open coding, the two-research staff and qualitative study expert reviewed the codes and transcripts, with the qualitative expert settling any discrepancies. The research staff and qualitative expert identified major themes that emerged and characterized patients'

**Table 1. Sociodemographics of participants.**

| Variable | Overall N = 57<br>*n* (%) |
|---|---|
| **Gender** | |
| Female | 41 (71.9) |
| Male | 16 (28.1) |
| **Age in years** | |
| Overall, mean age + SD | 61.05 ±10.4 |
| **Education level attained** | |
| High School | 30 (52.6) |
| Some College / Undergraduate | 18 (31.6) |
| Vocational School | 5 (8.8) |
| Elementary | 4 (7.0) |
| **NCD Diagnoses** | |
| Hypertension | 48 (84.2) |
| Coronary artery disease | 28 (49.1) |
| Type 2 diabetes | 24 (42.1) |
| Cerebrovascular disease | 4 (7.0) |
| Chronic kidney disease | 2 (3.5) |

SD, Standard Deviation; NCD, non-communicable disease

experiences receiving ABC-MMC services available at their individual barangays.

## RESULTS

Six focus groups were conducted with a total of 57 participants (28.1% male and 71.9% female). All participants were Filipino with an overall mean age of 61 years (see Table 1). Over half (52.6%) had a high school education, and a majority (70.2%) were classified as low-income status. A majority (84.2%) were diagnosed with hypertension, and 42.1% had type 2 diabetes. Average duration for ABC-MMC patient enrollment was 2.3 years. Four major themes emerged from focus group responses: (1) barriers for access to healthcare, (2) facilitators for access to healthcare, (3) positive perceptions toward ABC-MMC, and (4) varying health literacy levels.

### Theme 1. Barriers for access to healthcare

Participants identified the following barriers to attending monthly follow-up visits for NCD management: (1) patient healthcare visit scheduling conflicts, (2) family/work responsibilities (3) financial limitations, and (4) infrastructure and natural physical barriers. Firstly, missing clinic appointments due to work schedule conflicts was a common occurrence. Several participants commented that, 'No, not everyone is able to come because they need to go to work' (transcription page (tp) 46). A participant said, 'The problem is the time; others are working. If there will be a common time that they could also attend, there are a lot of patients who have diseases like knee pain and body aches' (tp57).

Furthermore, even if patients were retired, family responsibilities prevented them from keeping their appointments. For example, one woman said, 'I still have household chores and I take care of my grandchild, and I can't just leave all of those behind' (tp77).

Most participants stated that finances were a barrier to medication schedule compliance. One participant said, 'I take my medicines everyday if I have money, but if I don't have money, I'm unable to take my medicine' (tp12). Another patient talked about how he relied on family assistance: 'I need to buy my medicine especially because I am diabetic. I need my insulin and (because) I am asthmatic, I need my inhaler. That is why I ask for money from my children, especially now that I'm old and I can't get a job' (tp18).

Several participants identified geography, infrastructure (inadequate roads and bridges), and mother nature (inclement weather) as barriers to accessing healthcare. In reference to one of her peers, another participant commented, 'She needs to purchase her medicine. She goes to the town proper and takes three rides for them' (tp18). During adverse climate events, transportation is often unavailable. Furthermore, the medical director explained that rural inhabitants often lack timely transportation to city centers, thus they are unable to maintain a schedule for routine medical care.

Finally, patients' attitudes and human error were determined to negatively impact follow-up care. One participant stated, 'I am forgetful. I am so forgetful that sometimes I ask around [about] when you are arriving' (tp14). Another participant described the lackadaisical attitude of his fellow community members toward issues of personal health, stating 'Lazy! They don't want to give time' (tp89).

### Theme 2. Facilitators for access to healthcare

Participants regarded ABC-MMC as a facilitator for accessing healthcare through (1) disseminating health information via use of digital technology to communicate with health providers, (2) utilizing trained CHWs, and (3) providing low-cost medications.

Disseminating health information via text messages and social media was found to increase patients' utilization of ABC-MMC services. For example, participants appreciated the easy access to health information and providers, 'It's nice that you (ABC-MMC) have contact with our number. There is also Messenger [from Facebook] and we are able to talk with you there' (tp20); and 'We are personally being texted and you are informing us (about health information and scheduled appointments)' (tp39).

Trained CHWs in each barangay, as well as Filipino medical staff, helped to provide culturally competent care and a local point-of-contact for patients. One patient reported she knew when to follow-up because 'the barangay informs us' (tp62). A CHW expressed, 'I am able to contact you whenever our patients have problems, I can call you… Even the personal life of Doc we are already disturbing. Super kind' (tp36). Moreover, the barangay CHW and participants with access to digital technology share health information and clinic appointment reminders with participants who do not have access to digital technology.

Lastly, patients perceive that ABC-MMC services helped to alleviate their financial stress and worries about the cost of health services. One patient commented on the accessibility provided by ABC-MMC, 'Life was made easier because you don't have to buy medicine from a pharmacy' (tp54). Another said, 'My medicines are very expensive, but here I get them (now) for free. That is why I am very thankful to [ABC-MMC]' (tp13).

### Theme 3. Positive perceptions toward ABC-MMC

Participants expressed satisfaction and gratitude for the ABC-MMC services. Many appreciated the kindness

shown by the medical staff. Several participants praised the physician/medical director. One patient stated, 'The doctor is kind (and) accommodating. Even if the patient is new, you accommodate them' (tp34). Overall, participants were pleased with monthly appointments, saying 'I really like that you see us every month because we can really tell you what we feel' (tp74). Participants expressed appreciation for the role of ABC-MMC as a safety net for barangays that are otherwise unequipped to provide community members with routine medical care for hypertension and type 2 diabetes. Other participants expressed their preference for in-person versus telemedicine appointments and offered suggestions for expanded services. Participants also expressed a desire for expanded pharmaceutical and medical services. One patient said, 'If there are vitamins available, it would be better' (tp42). Other patients wanted access to laboratory testing and radiology imaging.

### Theme 4. Varying health literacy levels

The focus groups highlighted varying degrees of health literacy, including limited or inaccurate knowledge about (1) how diet can increase risks for hypertension and type 2 diabetes, (2) hypertension and type 2 diabetes etiology, treatment, and prevention strategies, (3) use of telemedicine and lastly, (4) importance of routine medical care and medication adherence.

Non-pharmacologic interventions were prominent topics in focus group discussions. Participants demonstrated varying knowledge levels regarding healthy lifestyle practices such as diet. When asked about blood glucose, one woman said, 'Don't eat lots of rice. That is the one that really increases your sugar' (tp44); while another participant responded, 'I avoid foods that are fatty and salty… go on a diet' (tp7).

Similarly, participants demonstrated variable and sometimes fallacious knowledge regarding hypertension and type 2 diabetes etiology, treatment, and prevention strategies. For example, one patient demonstrated inaccurate knowledge about how to control blood glucose levels, saying 'If not controlled, I find ways and medicines. If there is still no medicines, I'll drink juice' (tp27). In contrast, another participant stated, 'Complications [of hypertension and diabetes] may damage your lung, kidney, liver, heart' (tp8).

Other participants demonstrated discrepant levels of knowledge regarding telemedicine. Some patients understood the concept of telemedicine, saying 'Telemedicine is the use of cellphone for them to talk to you properly and for them to know what to do' (tp21). Another participant seemed confused by the concept of telemedicine, admitting 'I don't know what telemedicine is' (tp21).

Finally, participants expressed widely varying attitudes regarding the importance of medical care, adherence to medication, and appointment schedules. One patient said, 'If you don't have yourself checked-up, you wouldn't know if [your blood sugar] goes up or down; you'll know what food to avoid especially if you are hypertensive and diabetic' (tp9). Others had limited knowledge about chronic disease management saying 'For me, sometimes my blood pressure is elevated, sometimes it is low, so what is the normal blood pressure?' (tp4).

## DISCUSSION

This is the first qualitative study to explore community engagement with a mobile medical clinic model of care in an underserved, low-income, rural Philippine population. Our findings add to the limited and nascent body of knowledge about improving access to medical services, management of hypertension and diabetes, and preventive health education for these underserved Philippine communities. Our study identified four major themes from focus group responses: (1) barriers for access to healthcare, (2) facilitators for access to healthcare, (3) positive perceptions toward ABC-MMC, and (4) varying health literacy levels.

Access to healthcare, such as clinic visits and affordable medications, is a limiting factor in chronic disease management in many rural low-income Philippine communities. One study based on five different low- and middle- income countries – including the Philippines – found that access to low-cost or free medications increased the likelihood of medication adherence and disease management.[11] Overall, this study estimated only 38% of individuals with chronic diseases in the Philippines had access to affordable medications. This study further demonstrated that poverty and limited financial resources reduced patient medication adherence, (i.e. having to borrow money to buy medicines decreased the likelihood of obtaining medications). Similarly, our study supports findings that despite limited patient health literacy and unhealthy dietary habits, countries such as the Philippines can markedly improve chronic disease management by providing patient access to low-cost or free medications.

Also, the participants welcomed ABC-MMC and were mostly satisfied with its health services. ABC-MMC facilitated access to chronic disease healthcare services for low-income individuals living in rural barangays. Besides physical examinations and primary healthcare, services included preventive health education (benefits of physical activity and healthy eating) and access to low-cost medications (encouraging patient adherence to medication regimens and disease management). Suggestions for improving ABC-MMC included expanding health services with laboratory testing and radiology imaging.

Our study also found that many patients were motivated to attend follow-up visits because of their positive experiences with the ABC-MMC physician. This increased trust in the mobile health clinic services and healthcare staff.

Another important finding was the lack of health literacy in the rural Philippine barangays. To enhance health services, ABC-MMC addressed the need to promote health literacy among their patients by having CHWs conduct culturally appropriate ongoing patient education promoting physical activities and healthy eating to encourage patient engagement and improve health outcomes. Misconceptions of chronic diseases are well-documented and often result in poor health outcomes. One study of 71 Filipino participants from either a rural province or an urban city found that many patients in the Philippines viewed hypertension as an acute condition rather than a chronic disease.[12] The study highlighted how participants' misperceive hypertension as an illness that 'just comes and goes', and requires medication only when it comes. Similarly, other participants reported only taking medications following episodic symptoms of hypertension.

Another study ($N$ = 20,749), based out of the Philippines, which evaluated the 2013 Philippines National Nutrition Survey demonstrated that diet was markedly inadequate among adults, primarily due to a rice-dominant dietary pattern with few nutrient-dense foods.[4] Our study showed that health education can play a role in mitigating poor dietary habits (see Table 2). Our study also supports the 2013 survey study's findings that efforts to promote patients' lifestyle health education is essential for mitigating chronic disease exacerbation among underserved Philippine populations.

**Table 2. Samples of focus group responses.**

| | | |
|---|---|---|
| **Theme 1: Barriers for access to healthcare** | **Competing responsibilities** | 'No, not everyone is able to come because they need to go to work' (46)* |
| | | 'I still have household chores and I take care of my grandchild, and I can't just leave all of those behind' (77)* |
| | | 'I take my medicines everyday if I have money, but if I don't have money, I'm unable to take my medicine' (12)* |
| | **Adverse climate** | 'Even if the flood is high, we'll still go because we need the medicine. It's you who has the problem because the roads are difficult when the floods are high' (35)* |
| | **Patient behavior** | 'I am forgetful. I am so forgetful that sometimes I ask around when you are arriving' (14)* |
| **Theme 2: Facilitators for access to healthcare** | **Communication using digital technology** | 'It's nice that you have contact with our number. There is also Messenger [from Facebook] and we are able to talk with you there' (20)* |
| | | 'We are personally being texted and you are informing us' (39)* |
| | **Access to low-cost medications** | 'Life was made easier because you don't have to buy medicine from a pharmacy' (54)* |
| | | 'My medicines are very expensive, but here I get them for free. That is why I am very thankful to [ABC-MMC]' (13)* |
| | **Easier access to healthcare staff** | 'I am able to contact you whenever our patients have problems, I can call you… Even the personal life of Doc we are already disturbing. Super kind' (36)* |
| **Theme 3: Positive perceptions toward ABC-MMC** | **Desire for expanded pharmaceutical and medical services** | 'If there are vitamins available, it would be better' (42)* |
| | | 'Do you have X-ray, ultrasound, or CT scan because there is none here' (40)* |
| | **Satisfaction with monthly appointments and preference for in-person versus telemedicine** | 'I really like that you see us every month because we can tell you what we feel' (74)* |
| | | 'Doc, during this time of the pandemic, [telemedicine] is okay. However, we think it's better that we see you personally' (42)* |
| | **Kindness of medical staff** | 'The doctor is kind, he is being accommodating. Even if the patient is new, you accommodate them' (34)* |
| **Theme 4: Varying health literacy levels** | **Varying health literacy about HTN, T2DM, disease management, and complications** | 'Don't eat lots of rice. That is the one that really increases your sugar' (44)* |
| | | 'If not controlled (T2D), I find ways and drink medicines. If there is still no medicines, I'll drink juice' (27)* |
| | | 'Diabetes may cause you to have cancer. Our white blood cells increase, then resulting you to increase in BP which leads to worsening of diabetes which may result to heart attack' (2)* |
| | | 'Complications [of hypertension and diabetes] may damage your lung, kidney, liver, heart' (8)* |
| | **Varying comprehension about telemedicine** | 'Telemedicine is the use of cellphone for them to talk to you properly and for them to know what to do' (21)* |
| | | 'I don't know what telemedicine is' (21)* |
| | **Misconceptions about medication and usage** | 'If you don't have yourself checked-up, you wouldn't know if [your blood sugar] goes up or down; you'll know what food to avoid especially if you are hypertensive and diabetic' (9)* |
| | | 'Sometimes Doc, my blood pressure is low and that is why I don't take [medicines]' (12)* |

**Numbers correspond to page numbers of transcription.*

More importantly, ABC-MMC facilitated culturally appropriate quality healthcare by (1) providing full-time Filipino medical staff and (2) allowing for long-term NCD management and continuity of care. Often, with charitable short-term medical missions (i.e. those providing health services for less than 1 month), there is less consideration for nuances of homeland culture. Rather than relying on outside healthcare providers, and by employing local CHWs from each barangay as well as a Filipino healthcare team that spoke the local dialects. ABC-MMC prioritizes cultural practices, values, and language to enhance the quality of healthcare and promote community engagement. ABC-MMC also promotes stable, long-term NCD continuity of care. Despite serving a high volume of patients, short-term medical missions frequently leave patients without options for continued care as patients are often unable to obtain medications refills or schedule follow-up visits. One study examining oral-facial clefting in the Philippines postulates that medical missions allow the government to neglect its developmental role in addressing social inequities.[13] The positive short-term benefits of medical missions are evident, but long-term NCD management is difficult using this model of care. ABC-MMC achieves continuity of care that allows patients to benefit from stability in the long-term management of their NCDs.

### Limitations and strengths

Limitations of the study include participant bias. Those with work schedule conflicts, constrained transportation, and family responsibilities could have limited focus group participation by ABC-MMC patients, thus biasing study results. Researchers' characteristics (socioeconomic differences) and methodological constraints (focus groups in which not all participants were required to respond to all questions) may have also influenced data collection. Study results cannot be generalized to all Filipinos. The study could be strengthened by conducting focus groups with participants from the other remaining 12 barangays. The gender imbalance with majority of female participants may have biased the perception of participants due to the prevalence of the male-dominant workplace in many rural Philippine communities, future studies could aim to capture the perspectives of a greater number of male participants.

Strengths of this study included thorough health assessment from 6 of the 18 barangays served by ABC-MMC. Another strength was the use of local CHWs to facilitate the focus groups. This likely led to more accurate responses given participants' familiarity with and trust of CHWs, and avoidance of language barriers that otherwise could have been problematic due to dialectic nuances between Philippine barangays.

## CONCLUSIONS AND IMPLICATIONS

Our study identified both barriers to and facilitators for access to healthcare services, assessed patient satisfaction with ABC-MMC, and evaluated patient health literacy in the barangays. It found that there were non-modifiable barriers to care, such as work and family responsibilities, cost of medical care, and natural weather and geographic phenomena. Results also revealed deficiencies in patients' health literacy for example, misperception of NCD management limiting medication adherence and participation in healthy lifestyles.

Nevertheless, it highlights how ABC-MMC could successfully facilitate NCD management by providing continuity of healthcare services with follow-up visits, and low-cost medicines. Furthermore, it validated the use of CHWs to provide patient appointment reminders and health education, particularly on the importance of follow-up visits, medication adherence, engagement in regular physical activities, and healthy eating.

To the best of the authors' knowledge, ABC-MMC is the first major preventive healthcare program in the Philippines focused on continuity of care and utilization of digital technology for remote patient visits and communication with phones and electronic medical records for chronic disease management. Overall, ABC-MMC was well-received by participants, while addressing the lack of primary healthcare services in rural areas among low-income Filipinos. This suggests that ABC-MMC can serve as a global model for future mobile health clinics to cater to rural communities worldwide.

This qualitative study did not address the cost-effectiveness of ABC-MMC. Therefore, further research is needed to assess ABC-MMC effectiveness in improving health outcomes and identifying whether this is an economically sustainable healthcare model for delivering access to healthcare, not only to medically underserved Philippine rural communities, but also other underserved global communities.

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## ARTICLE INFORMATION

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