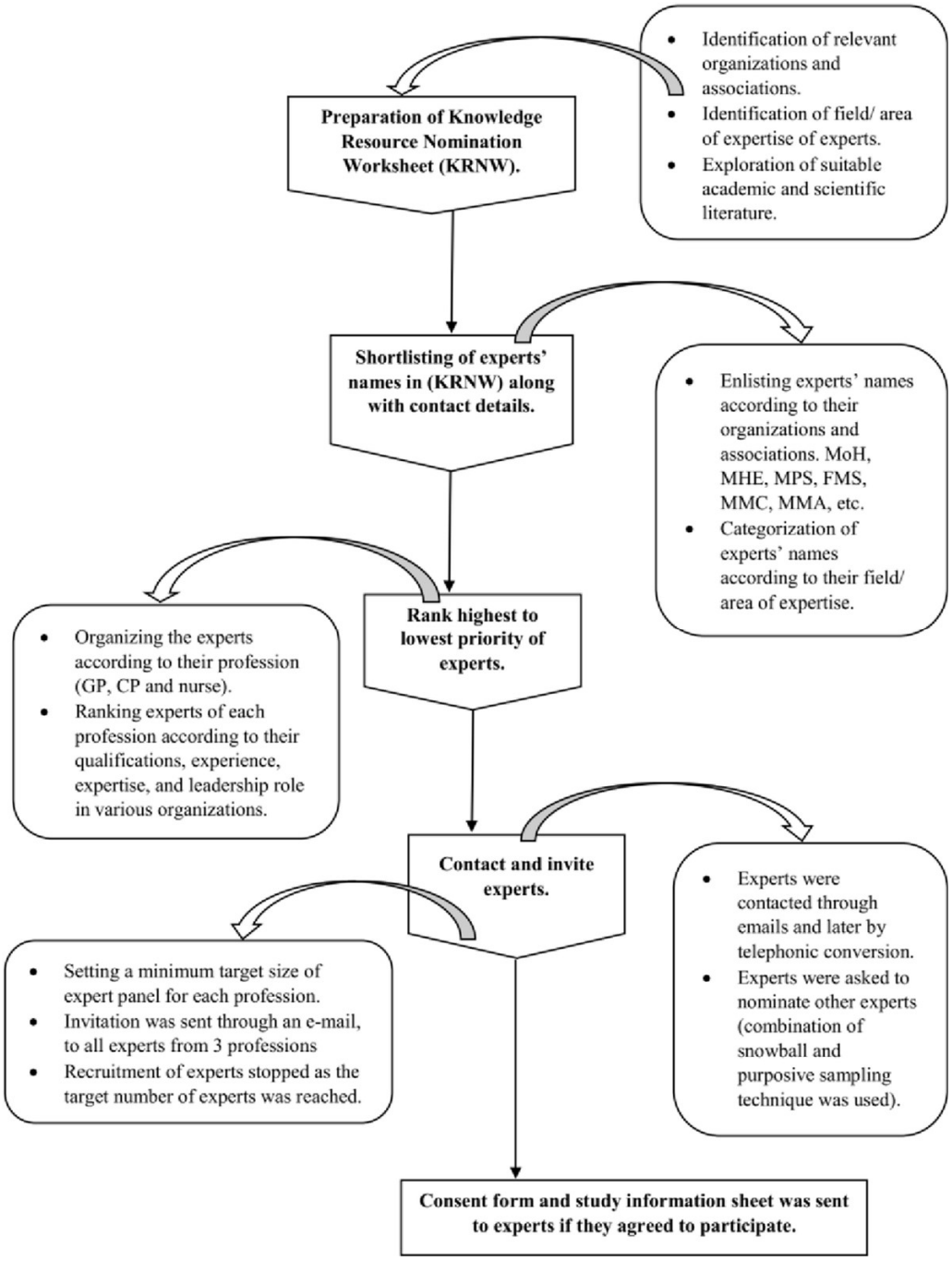
Supplementary Materials

a) Table S1 Comments of experts in Delphi survey

Respondent ID	Expert category	Comments
26064708	GP	″Currently there are cases of CF diagnosing and treating walk in patients without consulting a GP/Doctor″.
25841371	GP	″GP organizations e.g. Malaysian Primary Care Network and PERDIM will oppose to this″.
25864201	GP	″GP is business, selling medication is part of the GP income that is why CP very difficult to establish in asia″.
25763981	Nurse	″Cost for hiring trained CP″.
25648264	GP	″Line of communication between GP and CP is not really established″.
25523983	CP	″Limited choice of drugs in GPs set up″.
25438411	CP	″GP may lost their patients to CP″.
24900646	GP	″Double charging i.e. GPs and CPs″.
24888376	GP	″Difficulty for the patient as patient needs to get the service outside GP clinic and may incur more cost and time for patient″.
24887445	CP	″Lack of training as a family physician″.
25264671	GP	″GPs perceived CPs as a threat to their profession″.
25841371	GP	″Pharmacists are not interested to collaborate with GP″.
25864201	GP	″GP do not want the CP disturb their business coz this lead to low income″.
25523983	CP	″GP do not know the role of CP″.
25438411	CP	″The government/ ministry of health is not bothered about upgrading private primary healthcare services″.
24966946	GP	″Over the counter medication hardly seen a pharmacist given proper instruction to patients. Majority run by unqualified staff because the owner want to save money″.
24887445	CP	″Lack of training in clinical skills″.
25841371	GP	″Customers think about Logistic problems, where they need to go to 2 places for their consultation and drugs″.
25683647	Nurse	″Communication pt's data″.
25438411	CP	″Inconvenience″.
24966946	GP	″Consumer wants fast and hassle free service″.
25648264	GP	″Education and dialogue rather than an agreement″.
25724358	CP	″The CMTM Formal Agreement should be signed only at Health Ministry Level. There is no need to duplicate it at professional organizations level″.
24966946	GP	″Customer maybe exposed to extra charge″.
24887445	CP	″Provide incentives to both for this collaboration″.
25264671	GP	″We must address the health financing system at the top level. CMTM may work if the financier remunerate GPs for chronic disease consultations. Without proper health financing system, patients will be reluctant to pay out-of-pocket for GPs and CPs services at the same time.

		It will be an extra burden to them. As it is now, many patients are already illegally buying 'prescription-only-medications (POM)' from CPs, without seeing any doctor!″.
25438411	CP	″Without dispensing separation all these efforts will be just an academic exercise″.
24966946	GP	″Maybe start pilot project first″.
24887445	CP	″Embrace real team work in managing medications for patients″.
25724358	CP	″CMTM should never be accredited service. Focus should be on Pharmacy Degree Course contents″.
24966946	GP	″Should be iso oriented″.
25264671	GP	″Whenever possible, generic medications should be prescribed by the GPs and dispensed by the CPs under the CMTM, unless patients are willing to pay out-of-pocket for branded medications″.
24966946	GP	″Monitored regularly to avoid mistake″.
26499291	GP	″Ensure enough pharmacists available in all areas″**.**
25264671	GP	″How many pharmacists do we have now to cater for 32 million population? ″
26499291	GP	″GPS must get appropriate consultation fees which is not happening, and this also prevents CMTM esp. due to MCOs etc. - forgot to put this as a barrier prev.″.
25264671	GP	″CPs should also stop all the illegal dispensing of POM, without doctor's prescriptions. This is happening rampantly in Malaysia as we speak. This is the main reason why GPs have lost trust on CPs!″.
25724358	CP	″Malaysian Community Pharmacy Guild (MCPG) and MPS (Malaysian Pharmaceutical Society) should jointly work out a fee structure, in collaboration with Bahagian Farmasi Perkhidmatan (BPF) of MOH. The fact is these three parties (MCPG, MPS and BPF) had already worked out such a fee structure for Dispensing Charges and Drug Reimbursement Mechanism in 2015. This work was in anticipation of Dispensing Separation to be implemented in 2017 (under MOH BPF Master Plan)″.
24966946	GP	″It is just basically money matter, if we can be honest to public that this collaboration actually to minimize burden by both parties like overburdened, overloaded and etc. That is the best″.
26064708	GP	″Patients' rights should be addressed if the CMTM involves extra monetary expenditure″.
25438411	CP	″First must have dispensing separation″.
24966946	GP	″Advertise first to publicize their response″.
26064708	GP	″How does CMTM reduces cost of therapy? ″
25438411	CP	″The private primary healthcare service must be converted into a fee-based service. Selling price of medicines must be controlled. Fees for various services by the GP and CP must be standardized″.
24966946	GP	″Public need to understand first this move otherwise the opposition will politicize it″.

b) Figure S1 Flow chart of the sample recruitment in Delphi study



"**Notes:** Figure reproduced with permission from [Mubarak N, Hatah E, Aris MAM, Shafie AA, Zin CS. Consensus among healthcare stakeholders on a collaborative medication therapy management model for chronic diseases in Malaysia; A Delphi study. *PLoS One*. 2019;14(5):e0216563. doi:10.1371/journal.pone.0216563. https://journals.plos.org/plosone/article/authors?id=10.1371/journal.pone.0216563;

c) Table S2 The consolidated criteria for reporting qualitative studies (COREQ)

	Guide questions/ description	Remarks	Page no.
Domain 1: Research team and reflexivity			
Personal characteristics			
1. Interviewer/ facilitator	Which author/s conducted the interview or focus group?	NM conducted the interviews	11
2. Credentials	What were the researcher's credentials? e.g., PhD, MD	CSZ was a post-doc, NM was the MS.	1
3. Occupation	What was their occupation at the time of the study?	CSZ was researcher/ academician. NM was PhD candidate	1
4. Gender	Was the researcher male or female?	Male	11
5. Experience and training	What experience or training did the researcher have?	Interview taking and qualitative data analysis workshops on "how to conduct qualitative research" and "how to use NVivo software to analyse the data".	11
b) Relationship with participants			
6. Relationship established	Was a relationship established prior to study commencement?	Yes	11
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g., personal goals, reasons for doing the research?	Participants knew the interviewer from the interaction in the previous Delphi study.	11
8. Interviewer characteristics	What characteristics were reported about the interviewer/ facilitator? e.g., Bias, assumptions, reasons	The characteristics of each author have been reported on the title page of the Manuscript.	11

	and interests in the research topic		
Domain 2: Study design			
a) Theoretical framework			
9. Methodological orientation and theory	What methodology orientation was stated to underpin the study? e.g., grounded theory, discourse analysis, etc.	Interpretative descriptive and thematic analysis.	12
b) Participant selection			
11. Method of approach	How were participants approached? e.g., face-to-face, telephone, mail, email.	Telephone and Email	9
12. Sample size	How many participants were in the study?	12	14
13. Non-participation	How many people refused to participate or dropped out? Reasons?	13 KIs were contacted, 1 refused due to schedule conflict.	14
c) Setting			
14. Setting of data collection	Where was the collected? e.g., home, clinic, workplace	Respective offices	14
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	Complete privacy, no other person was present.	14
16. Description of sample	What are the important characteristics of the sample? e.g., demographic data, date	Demographic data (Table 1 and Figure 1) and diverse affiliations of KIs with various professional organizations representing GP, CP and Nurses in Malaysia are given in Table 2.	15
d) Data collection			
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Provided before interviews. Yes, pilot tested. The interview guide was pilot tested for any	10

		modifications or improvements on one CP, one nurse, and two GPs, who were not involved in this study later.	
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	No	NA
19. Audio/ visual recording	Did the research use audio or visual recording to collect the data?	Yes	12
20. Field notes	Were field notes made during and/ or after the interview or focus group?	Yes, during the interviews.	12
21. Duration	What was the duration of the interviews or focus group?	A total of twelve interviews (five CPs, five GPs and two Nurses) for a total duration of 636 mins.	14
22. Data saturation	Was data saturation discussed?	Yes	14
23. Transcripts returned	Were transcripts returned to participants for comment and/ or correction?	Yes	13
Domain 3: Analysis and findings			
a) Data analysis			
24. Number of data coders	How many data coders coded the data?	Transcripts were coded by two authors (NM and SK) independently based on the principles of thematic analysis and constant comparison approach.	12
25. Description of the coding tree	Did authors provide a description of the coding tree?	Yes	27
26. Derivation of themes	Were themes identified in advance or derived from the data?	Derived from the data	15

27. Software	What software, if applicable, was used to manage the data?	NVivo plus [version 12, QSR International]	12
28. Participant checking	Did participants provide feedback on the findings?	All the transcribed files were sent via email to the interviewee to correct and send back (if anything was not recorded or transcribed accurately). However, none reported any significant error in transcribing.	13
b) Reporting			
29. Quotations presented	Were participant quotations presented to illustrate the themes/ findings? Was each quotation identified? e.g., participant number	Yes	20, 21, 22, 23
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Yes, there was consistency between the data presented and the findings.	20, 21, 22, 23
31. Clarity of major themes	Were major themes clearly presented in the findings?	Yes	20, 21, 22, 23
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Yes	Supplementary file, Table 3-7

Notes:

Adopted from: "Nik J, Lai PS, Ng CJ, Emmerton L. A qualitative study of community pharmacists' opinions on the provision of osteoporosis disease state management services in Malaysia. BMC health services research. 2016 Dec;16(1):1-4."

Disclaimer: "Please note page numbering in this table is from the submitted Word manuscript for the paper and does not match the final PDF version of the paper that was published."

d) IREC Approval

الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
(Company No 101067-P)

RESEARCH MANAGEMENT CENTRE

Our Ref. : IIUM/504/14/11/2/IREC 656
Date : 7th October 2016

Asst. Prof. Dr. Che Suraya Haji Mohd Zin (Principal Investigator)
Department of Pharmacy Practice
Kulliyyah of Pharmacy
International Islamic University Malaysia
Indera Mahkota Campus
25200 Kuantan, Pahang

Dear Asst. Prof. Dr. Che Suraya Haji Mohd Zin,

The IIUM Research Ethics Committee (IREC) has reviewed your study protocol as mentioned below:-

ID NO.	:	**IREC 656**
TITLE	:	**Building An Evidence Base For The Medicine Management Model In Malaysia: Stakeholders Perspective On Collaboration Of Community Pharmacists And General Practitioners**
REGISTRATION DATE	:	**26th August 2016**
CO-INVESTIGATOR	:	**Assoc. Prof Asrul Akmal Shafie (USM), Dr Ernieda Md Hatah (UKM), Assoc. Prof. Dr. Aznan Md Aris (IIUM)**
STUDENT	:	**Naeem Mubarak (PhD Student)**
NAME OF SITE	:	**International Islamic University Malaysia (IIUM) Kuantan Campus**
DURATION	:	**1st May 2016 - 31st March 2019**

The IIUM Research Ethics Committee (IREC) operates in according to the Declaration of Helsinki, International Conference of Harmonization Good Clinical Practice Guidelines (ICH-GCP), Malaysia Good Clinical Practice Guidelines and Council for International Organizations of Medical Sciences (CIOMS) International Ethical Guidelines.

The following documents have been received and reviewed to the above study:-

1. Study Proposal/Protocol: Version 1, revision 00, dated 26-Aug-16
2. Informed Consent Form (ICF):-
   - i. Information Sheet – English: Version 1, revision 00, dated 26-Aug-16.
   - ii. Consent Form – English: Version 1, revision 01, dated 16-Sep-16.
   - iii. Information Sheet – Malay: Version 1, revision 00, dated 26-Aug-16
   - iv. Consent Form – Malay: Version 1, revision 01, dated 16-Sep-16

QUALITY SYSTEM
SIRIM
CERTIFIED TO MS ISO 9001:2008
Registration No. AR 3492

3.	Questionnaire: Version 1, revision 00, dated 26-Aug-16
4.	Approval Letter from Kulliyyah
5.	Pre-Submission Screening Document
6.	Principal Investigator's CV

Decision by IIUM Research Ethics Committee (IREC):

(√) Approved
( ) Disapproved

Date of Approval: **October 4, 2016**

The investigator(s) are required to:

a) register the study with National Medical Research Register (NMRR) for any study done in Ministry of Health (MOH) facilities.
b) notify IREC of any change in protocol and obtaining further ethical approval as appropriate.
c) report any adverse incident during the course of a study to IREC even if the incident is not directly related to the study.
d) report serious adverse event (SAE) within 24 hours.
e) report minor adverse event within 2 weeks.
f) provides information of minor protocol deviation in Progress Report or End Report whichever necessary.
g) report any major protocol deviation occurs within 5 working days.
h) submit Progress report form before the end of six (6) month given by IREC.
i) complete and submit the End of Project Report Form to the IREC Secretariat's Office.

Thank you.

Yours sincerely,

PROF. DATO' DR. TARIQ ABD RAZAK
Chairman,
IIUM Research Ethics Committee (IREC)

Copy : Protocol File – IREC 656

e) Information and Consent Form

Project Information Sheet

Name of the Project:

'Building an Evidence Base for the Medicine Management Model in Malaysia: Stakeholders Perspective on Collaboration of Community Pharmacists and General Practitioners'

Principal Investigator:

a) Dr Che Suraya Haji Mohd Zin, Deputy Dean (Research), Kulliyyah of Pharmacy, International Islamic University Malaysia (IIUM). Tel: +6 09 570 4909 chesuraya@iium.edu.my

b) Naeem Mubarak; PhD Scholar. 0149197566. (Naeem.mubarak@lmdc.edu.pk)

Description of the Project:

a) You are invited to participate in a research study because you are one of the healthcare professionals/experts (GPs, Pharmacist, Nurses).

b) The project is designed to gather information about possibility of collaborative medicine management model through community pharmacists and general practitioner to improve patient care and reduce cost of illness in Malaysia.

c) This project involves interviews which would be audio recorded (approx. 40 min).

d) It is solely your decision as to whether or not participate in this research study. If you decide to participate, you will be given this information sheet to keep and you will be asked to sign a consent form.

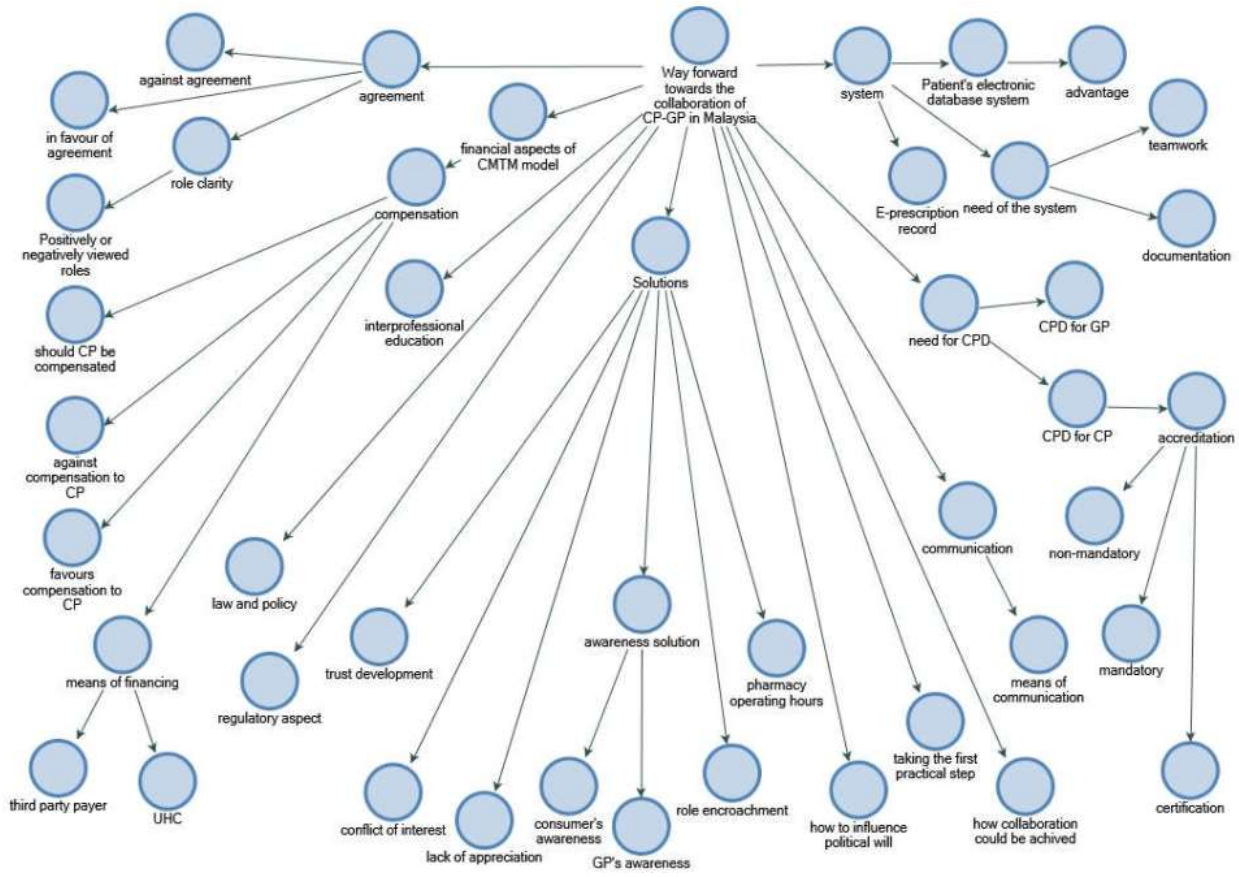
e) You are free to withdraw at any time, and without giving a reason.

f) You will not be paid for this research study.

g) The results of this research study will be informed to all participants of the study and it will be published in a scientific journal, but your identity will not be disclosed.

h) This study has been approved and it adhered to all the guidelines required by the Ethical Committee International Islamic University Malaysia and Jawantankuasa Etika dan Penyelidikan Perubatan (Medical Research& Ethics Committee) Kementerian Kesihatan Malaysia, d/a Institut Pengurusan Kesihatan, Jalan Rumah Sakit, Bangsar 59000 Kuala Lumpur. If you have any questions, please do not hesitate to ask the MREC (Tel: 03 22829082/9085/0491 or 03 22874032, Fax: 0322828072/0015)

f) Figure S2 Example of a Coding Tree



Notes: We can confirm the figure "Example of a Coding Tree" was never used in any manuscript/ previous paper published.

g) Table S3

Theme 1 Community Pharmacy Practice; understanding the difference between Malaysia and Developed countries

Subthemes	Explanatory notes	Supporting Exemplars
Developed countries vs Malaysia	Majority of the KIs were aware of the vast difference in practices of modern collaborative care models operating through community pharmacy in developed countries and its positive impact in chronic diseases management in contrast to the situation in Malaysia.	″In UK for example, whole system of the healthcare clearly understands the role of the pharmacies in patient care and no one crosses the limits set that's why they manage to transform their practice towards more collaborative practice through strong legislature. International evidence shows, in Australia, UK, US, the collaborative practice between the GP and CP do have positive impact on the patient outcome. ″ (CP-4)
	Presence of DS is the main difference between developed countries and Malaysia where no defined roles and rights of CPs have been observed.	″In developed countries, CPs are involved in range of public health activities, but imagine if they do not receive patients what they would do? Nothing. They receive all prescriptions, because GPs cannot dispense, while in Malaysia, pharmacies hardly receive any prescription so they cannot practice like developed countries nor can bring a huge impact on the patient outcome. ″ (CP-2)
		″In Malaysia our GPs can prescribe, and they can dispense, it does not happen in developed countries where CP offers dispensing, educational and adherence support to patients. ″ (GP-3)
		″Of course, there's a vast difference between the practice of pharmacy in developing countries and Malaysia for example we don't have our DS and the GPs are dispensing the medication. ″ (CP-2)

h) Table S4

Theme 2 Current practices in primary care in Malaysia.

Subthemes	Explanatory notes	Supporting Exemplars
Malpractices in primary care	KIs were of the view that in primary care both professionals (CP and GP) neither bother law, nor follow the standard protocols or guidelines.	″Everybody is doing what is profitable for them, there are no checks and surveillance on the medicine use process. There is a need of system, which Malaysia lacks. We need a system if we want collaboration and make everybody to abide that system. ″ (N-1)
Malpractices at GP clinics	In the GP clinics, consultation time is short, and patients are counselled by staff not qualified to manage medicines. GPs manipulate patients and make money out of dispensing unnecessary and costly medications (only available at the specific clinic) which is a leading cause of rampant overprescribing in private primary care.	"GPs do not spend optimal time for an ordinary consultation, this results in poor patient counselling ″ (CP-5)
		″ In GP clinics, medications are dispensed by a non-qualified person. who don't know about the counselling technique, except take one tablet now, this is the maximum counselling offered, and majority of the time this person is nurse who herself is not trained in medications″. (CP-4)
		″The GP's side are making money out of the dispensing process, in doing so overprescribing is too high in private clinics. ″ (CP-4)
		″GPs are trying to use expensive new medicine, for medical condition. So, that the patient will not be able to find it elsewhere because the pharmaceutical supplier only gives those new medicines to the GP's clinic. So, they manipulate market through this practice. ″ (CP-5)
Malpractices at community pharmacy	CPs also do not follow law and standard guidelines and dispense medications without prescriptions and are highly commercialized which have reduced the element of patient welfare.	″In Malaysia, the pharmacy has developed into supplement shop., where O-levels students are attending patients and giving medicines. ″ (CP-1)
		" CPs do not bother law. They are actually prescribing medications, allure patients to come to the pharmacy and get diagnosed and get the drugs. I think so, that's where the law needs to be very strong. ″ (GP-1)
		″CPs in Malaysia are very commercialized, dispense prescription medicines without prescription, gives wrong advice, promote supplements over medicine/ nonevidence based therapy, doing lab tests etc. Currently there are

		cases of cardiac failure being diagnosed and treated for walk in patients without consulting a GP/Doctor resulting GPs low trust in the pharmacists. ″ (GP-3)
CP as an untapped national resource	Even GP side KIs admitted that CPs potential has not been and used in the right direction, despite their relevant qualifications.	″Definitely, they (CPs) are university graduates who are trained in medicines, but they have not been tested in Malaysia in patient care, they can be utilized in many public health activities, especially chronic diseases where there is a need to ensure adherence to medications″. (GP-1) ″They (CPs) have the relevant qualification, true, but as they are not practicing it so I am not sure whether they would be able to prove their worth in patient-care, however, additional clinical training may result in good performance″ (GP-3)
Perception about need of a prescription review	Most of the KIs had this view that prescription review has not been practiced, except in public sector. They emphasized the need of a prescription review service and believed it would improve medication safety and benefit chronic patients.	″In public sector, the prescriptions are reviewed all the time, because prescription is sent to the pharmacist and pharmacist will see prescription before dispensing. No doubt, Patient safety is greatly enhanced by having a CP. It doesn't matter really, we are in private or public, the care process should be the same. ″ (GP-4) ″I do not think there is any prescription review service in private sector in Malaysia, however, we do have in public hospitals, but if added in the private sector, it would add value in terms of medicine safety″ (GP-1)
GP as single care provider not enough for chronic patients	Majority of the KIs was of the view that the needs of a huge aging population may not be satisfied by the silo practice model especially for chronic diseases.	″It's a chronic disease so, to be just one provider, sometimes is just not enough. To drive home the message, they need to hear it from many aspects, from many people″ (GP-1) ″It depends, if it is a specialist GP with post-graduate qualification, definitely there would be enough counselling and enough advice for the patient, but if, it is just a GP without higher qualification, not enough. ″ (GP-2)

US= United States, UK= United Kingdom, KIs= Key informants.

i) Table S5

Theme 3 Potential Advantages of Community Pharmacist-General Practitioner collaboration in Chronic Disease Management

Subthemes	Explanatory notes	Supporting Exemplars
Why should they collaborate?	Majority of the KIs believed complexities of chronic care demand collaboration, and it would lead to medication safety and it would bring improvements in patient outcome, hence for patient's sake CP-GP should collaborate.	″The healthcare system has become more complex in chronic care. I think CP should take their active role. We are not supporting one another's role, but we should be collaborative and promote patient safety as errors in prescription by GP can be picked up by CP. ″ (GP-4) ″We see this from the business angle, that's why the trust is difficult to develop but if you see from the patients angle you want to give the benefit to patient through this collaboration ″ (GP-5) ″ We are not changing the medications for chronic patients; our mission is to improve patient's outcome and quality of life and we have the necessary knowledge and expertise to ensure rational use of medications. CP-GP should collaborate for the sake of patients benefit. ″ (CP-5)
Advantages of Collaboration for Stakeholders (CP and GP)	Collaboration would benefit both CP and GP	″If it (collaboration) works in Malaysia, at least both parties would make money, GP and the pharmacist, they can come up with a new business. ″ (N-2) ″Collaboration between GP and CP will help to improve the compliance of many of the chronic diseases and it would happen when it's a teamwork, with multidisciplinary team. ″ (GP-1)
	Collaboration would reduce GP's burden to purchase medicines and then dispense.	″GP itself will be benefitted because they really have to focus on managing their patients and their clinics along with that GP's have limited purchasing power. They have to purchase the medication to dispense. But if they collaborate with CP they don't have to think about it. They will have more clients of course. the patient will receive counselling. ″ (GP-3)
Advantages for Government	If there would be political will and implementation of appropriate policies, then collaboration would	″Of course, collaboration represents value for not only the government, but also for everybody. When you have less people get sick, they will be working where they work and therefore, it will contribute towards national economy. Similarly,

	reduce the burden on the public hospitals.	it will reduce the burden of patients on public hospitals but no political will. ″ (CP-5)
Advantages for Public (Patient)	-	-
Improvement in Adherence and Medication safety	CPs claimed that they could help in improving adherence.	″Medication safety and the medication adherence are poor in Malaysia. A CP based on his training can improve both. ″ (CP-4)
	The KIs commented about current situation of patient adherence of chronic patients and how it could be improved.	"CPs have a big role to play in collaboration with the GPs because chronic patients need adherence supports. So, when it will be a multidisciplinary team, it will help with the compliance and management of chronic disease. ″ (GP-1)
Humanistic Outcome	The CMTM model would enhance the humanistic outcomes of the patients.	″When you talk about CMTM, of course, when you minimize the side effects and ADRs, the quality of life will improve. […]″. (CP-3)
Clinical Outcome	The two-point checks on prescription (as part of CMTM model) would improve clinical outcomes, if collaborative model work in Malaysia.	″ research has mentioned that prescription errors are very high among the prescribers, when there is only one-point check, the same person prescribes and dispenses, but with collaboration, there is a two-point check, where, doctor prescribe, and CP dispense. So, on that ground, medicine use process will be in check which will improve clinical outcome. ″ (CP-3)
Economic Outcome	KIs also admitted economic benefits that would be brought by collaborative practices of CP and GP.	″When they (patients) have two professionals taking care of them, educating them about their conditions, public will opt a better service and by the way in the long run it is not expensive rather value for money. ″ (CP-1) ″GP might think you are saving for that part which CP could offer, the short term, but actually you are losing in the long run. ″ (GP-1)
If there is no collaboration?	If there would be no collaboration between CP and GP, it would affect patient outcomes, rise in medicine wastage and economic loss to government.	″Medicine wastage, because they don't take it the way they should, they don't understand it, and that can also be harmful and, in the long run that can cause problem to their own health or may increase the intensity of their disease, and they can be hospitalized later and it will cost a lot more to the patient as well as to government in the end. ″ (GP-1) ″We are dealing with the patients and on the contrary, neither the GP nor the CP will suffer, it's the patient who will suffer, if they (GP, CP) do not collaborate, it's time to think above business. ″ (CP-5)

j) Table S6

Theme 4 Major Barriers to Community Pharmacist-General Practitioner collaboration

Subthemes	Explanatory notes	Supporting Exemplars
Fragmentated healthcare system	A few KIs mentioned another side of the argument that collaborative practice or DS would make the situation cumbersome for patients as patient must go two places for healthcare advice. Under current system, patient is getting all under one roof.	″Sending patients to two different places (CP and GP) would practically fragment the healthcare system and suffocate patients. ″ (GP-4) ″It (DS) would not be favorable for patients who would be going to two places. ″ (N-1)
Hype in GPs' consultation fees	One of the KI (GP) mentioned that if aim of collaboration is DS it would result in escalation of consultation fee.	″GPs don't charge consultations that much, because of the private GP being very competitive in a business so, especially in urban setting, they get profit from dispensing. If we separate dispensing, consultation fee will be a lot more. So, the patient must have to pay a lot […] ″ (GP-1).
GP's related barriers **Threat to GP's Business/ Financial Conflict of Interest (Business Rivalry)**	GPs take CPs as threat to their business. KIs believed the financial conflict of interest appeared to be the major barrier of collaboration.	″I think the biggest threat to the private GPs will be reduction of income. GPs do not make much money from consultation under the current consultation rate. They make money from dispensing drugs. That is the main reason why they do not agree to the 'separation of function'. ″ (GP-1)
Lack of Trust	Most of the interviewees mentioned lack of trust as one of the major barriers in collaboration.	″GPs have concern because they don't know the intentions of CPs, if they would know the intention of the pharmacist is for patient's focus, they would be happier to share patient's information. Thus, there is lack of trust among GPs ″ (GP-4) ″CPs should also stop all the illegal dispensing of POM, without doctor's prescriptions. This is happening rampantly in Malaysia as we speak. This is the main reason why GPs have lost trust on CPs! ″ (GP-1)

Role Encroachment or Overlapping roles	Many KIs highlighted the possibilities of role encroachment or overlapping roles which may impeded collaboration and hence need considerations for any future policy development.	″there will be role encroachment of GPs, patients once referred to pharmacies would not be back″ (GP-3) ″We expect definitely overlapping roles, If you have 2 champions, then it becomes problematic, argument will definitely happen″ (GP-2)
Sharing patients' information with CP	There were mixed opinions about sharing of patient information with the CP. A few GPs have concerns, however, were flexible for limited sharing, while, other believe there is no harm in sharing patient information with CP as part of healthcare team.	″Not everything could be shared, especially certain information that you cannot share with the pharmacist, the sensitive information. This should be limited information given to pharmacist, that's all. ″ (GP-2) ″ They should make it (patient information) accessible to CPs. I agree to some extent with the GPs in a way that may be the misuse of information could be possible. It's basically a matter of trust and developing a fool proof system″ (CP-3) "When the billion patients come in, you have to educate the patients that there will be various persons involved at the point of care. That will be me (nurse), there will be doctors, there will be pharmacists. So, if you contact the pharmacists, they will review your medication and there will be assess of everything. So, if you educate, you counsel the patient I cannot see any problem in that″ (N-1)
CP's Related Barriers	The inadequate number of pharmacies and limited operating hours cannot accommodate the burden of chronic patients which requires extensive pharmacy setups working on extended hours.	″Patients come after office hours to the clinic. Clinic opens till let say, 10 or 11 pm, but the pharmacy, the pharmacist will only be around office hours. So, one is the number of pharmacies, number two its timings, they have to extend their hours, I mean there have to be a pharmacist in the pharmacy up to at least 12-midnight. ″ (GP-2)
Absence of DS	CPs believe absence of DS is the biggest barrier as it involves money. GPs do not want to share patients or money and hence never ready for collaboration. Contrary, in public	″You know this is all business, the more you prescribe, the more the company sponsors because this is private. So, if you have CP, indirectly you can stop this practice. Because there is no hidden agenda. When you talk about money you try to avoid the system, but when you go to the public

	hospitals, doctors are happy to collaborate with pharmacist as no money is involved.	hospitals you enjoy the system and accept pharmacist as a member of healthcare team. This is hypocrisy ″ (GP-5) ″It's all about money, when money is involved, they do not want to share or collaborate with pharmacist. When there is no money (as in public sector clinics) involved they would agree on DS as well as to share the patients″ (CP-1)
Consumer / Patient Related Barriers	The KIs highlighted the apparent cost of CMTM model from the consumer's view point where a consumer would have to pay to a GP as well as to a CP and the hassle patients would face when going to two points of care (GP and CP) may impede the collaborative practice.	″Cost; make sure the cost is reasonable, if you want to implement CMTM model. But in case, the cost is higher, that means the patient would have to pay more i.e., pay the GP and pay the pharmacy, both sides. I don't think then it will work, people will go to the traditional healer the easier″ (GP-5) ″Customers think about logistic problems, where they need to go to two places for their consultation and drugs in case of collaboration or DS. Consumer wants fast and hassle-free service. ″ (GP-3)
Lack of Awareness of CP roles	Lack of public and GPs' awareness about the roles and expertise of CPs was considered as one of the barriers in collaboration.	″You need to create the awareness first. You cannot just start like this, because people are not prepared. You need to explain them this is good for you. ″ (GP-5) ″It's clearly mentioned that GPs don't have the way of understanding of the extent to which the CPs have been trained for. ″ (CP-4) "The role of CP needs to be more widely known. There should be dialogues, there should be articles in the mass media, there should be testimonials from the patients. " (GP-1)
Lacunas in current legislation	Majority of the KIs mentioned the lacunas in current legislature regarding separation of roles and lack of monitoring of prescriptions.	″I think the legal pyramid needs to be very strong, if we want any such collaborations. You know that legally they (CP) are not allowed to dispense the drugs without prescription, is there any regulatory mechanism that monitors this? NO… Similarly, ideally GPs should not dispense. There are many deficiencies in the laws which needs a considerate review. ″ (GP1)

Lack of policy makers interest	Lack of interest of policy makers was another barrier mentioned.	″ The ideal environment, you want to have (CMTM model), you can have some of the limited success but it's going be very very difficult without 100% involvement of Ministry and a serious political will as policy makers have least interest due to higher stakes of GPs in healthcare system […]. ″ (CP-1)
Barriers in Financing CMTM	The way Malaysian healthcare system is financed makes financing of CMTM difficult. Public willingness to pay and health seeking behaviour also need improvements.	″Public is still GP oriented and it is hard for them to pay to CP for such services, I think they will not″ (GP-3) ″The biggest barrier to the implementation of (CMTM) would be the current healthcare financing system in Malaysia. CMTM will never work in the private healthcare sector as there is too much competing interests between GPs and CPs. CMTM may work if Malaysia has universal health insurance coverage for the population″ (GP-4)

k) Table S7

Theme 5 Way forward towards community pharmacist-general practitioner collaboration in Malaysia

Subthemes	Explanatory notes	Supporting Exemplars
Open communication to define roles	Most likely the 1st practical step towards CMTM model involves an open door for communication between two stakeholders to sit and chart out roles which are acceptable for both (CP and GP).	″First practical step is to get them together have a meeting and come up with a working plan. ″ (N-2) "To get that (CMTM), all should get together, to understand each other roles. These roles must not be overlapping, and clear cut defined, we need to work together to understand each other's roles. ″ (GP-1)
Positively / Negatively Viewed Roles of CP	Majority of the KIs expressed prescription review, education and adherence support as positively viewed roles of CP. They also had the view that dose adjustment and repeat prescription filling should be done collaboratively and not by the CP in silo fashion.	″Definitely, prescription review, advice on cost effective prescribing and adherence support are the roles which the pharmacists can play, and you know about half of the medication errors lead to prescription errors. But dose adjustment has to be done collaboratively. The pharmacy needs to contact GPs and discuss with the GPs in terms of dose adjustments. ″ (GP-4) ″Education and counselling and adherence support are the interventions a CP has been trained in″ (CP-5)
Law and Policy	A way forward to collaboration is to improve/ revise the law and legislation.	″New pharmacy legislation is necessary. GP and CP must accept each other's professional roles to serve the patient. ″ (CP-5)
	KIs mentioned the need of strong policies to drive the system because policies are better to run the system and it would also reduce the overlapping of the roles.	″There are two ways to go about this, one is the policy change of health financing system and hence, take away the revenue on dispensing by the GP. But GP must be compensated by having a proper rate of consultation fees. The other way is to train undergraduates from start to practice a collaborative working environment″ (GP-4) ″We should have a very strong policy, the GP should only prescribe whereas, the dispensing should be done by the CP. But the

		CPs also must follow what the polices are. ″ (GP-3) ″ Government must be proactive to explain to the both parties that any role encroachment or going against national policy, would be drastic. I think if they empower law and regulation all will follow, otherwise they will terminate your license. ″ (GP-5) "They must come up with the policy that defines roles and bound CP to not dispense or substitute medication without prescription or consulting the prescriber. On the prescribing sites, policy should bound GP to communicate with CP regarding a patient. ″ (GP-3)
Regulatory aspects	This is the high time when there is the need of some regulatory bodies to draft and monitor some protocols that should be followed for the welfare of the society.	"There must be somebody who form the secretariat or get the respective representative and then come up with the protocols and I am sure most of the GP and CP will then follow the protocols because it makes their life easy. ″ (GP-3) ″A national policy which sets protocols for both to define clear roles and then implementation of this policy should be monitored tightly by a regulatory body ″ (GP-4)
Favour DS	Surprisingly, majority of the KIs (including GPs' side KIs) was in favour of separation of dispensing and prescribing. DS saying that it would be beneficial for the patient outcome, and if the patients would be educated about this DS and its benefits then, they would also want this.	″Our public is not much educated and serious about healthcare because if they would understand, then they will probably want DS too as it will promote patient safety. Absence of DS also promotes biasness in drug selection, certain favorite drugs give more revenue. So, if you separate out dispensing, the GP will have a much neutral role. If we want to give the best service to patients, then we need to go back to the DS. ″ (GP-5) ″Ideally, there should be DS, we need to get out of centuries old system. Modern world does not appreciate competing interest when it comes to patient welfare″

	One of the nurses KI suggested that DS would be good for GPs as it will reduce their burden of workload.	″If you (GP) have thousand patients, you get exhausted so, your own quality of life as a healthcare provider will be affected. So, I think, you have to educate yourself too, that everybody has a role in the healthcare system ″ (N-1)
Financing means of CMTM model	If we see the financial aspect of CMTM model, then the means of compensation need to be chosen wisely. Majority of the KIs were in favour of UHC or third-party payer, as they think it could drive the system in the right direction and facilitate collaboration	″At present, I think the universal health coverage, or the third-party payer will be appropriate because the insurance company can pay money to fund this type of collaboration. ″ (CP-4) ″We are asking the government for UHC, otherwise, through insurance, or direct care for the patients. ″ (CP-5) ″Under universal health coverage there will DS so there will not be any financial conflict of interest and it will be system driven. ″ (CP-1) ″The government must implement UHC, to me only then that collaboration can happen. Now, you see, you are government, you can fund billion and billions of dollars, you make a law, you make everybody contribute to this fund and everybody will have the access to something, basic healthcare coverage. ″ (GP-1)
Against Compensation to CP only	KIs had mixed thoughts on whether a CP should be compensated in CMTM model or not. A few KIs believe that CPs should not be compensated for these services because they would be earning by selling the drugs.	″if they are taking a lot of prescriptions; they would be selling a lot of drugs. That's already business to them. I don't see any other compensation." (GP-2)
Favours Compensation to CP or CP and GP (a win-win situation)	Majority of the KIs were in favour to compensate CPs for all the services just like any other healthcare professional is paid.	″ Nobody works for free even the pharmacist in public hospitals do not work for free. […] We need a proper system of the payment, a fair system of payment. ″ (CP-5) ″If you want five-star service, this all can be done by money. You must invest money; you have to pay a registered pharmacist. In order to have best practice, you have to employ community pharmacist. ″ (N-1)

		″They (CP) must be compensated because they have to undergo accredited training program in order to qualify for this kind of collaboration and chronic diseases management. Why can't we follow Australian model where both GP and CP are compensated. That would be a win-win situation for both. ″ (GP-3)
How to influence the political will?	One of the GP participant mentioned that there is need of: proactive lobbing from CP community, pressure from patients, and payers, to influence the politicians in favour of CMTM model.	″Using the pressure groups, from the patients may be you can also influence the doctors and the CPs at the same time as they have influence on politicians, but I think to get the political will, it has to be like majority not only from the patients, it has also got to have the backing from the providers as well. CPs also need to put in proactive lobbing to convince politicians. ″ (GP-1)
Inter-professional education	There should be inter-professional training from the start of health sciences education.	″Training our undergraduates on how to look at different professionals within healthcare system would lay the foundation of collaborative attitude. You have to train them from start, in terms of attitude, being open to scrutiny, stepping out of fixed boundaries, listen to other's perspective, negotiating plan, etc. We are not supposed to be egoistic on our own. ″ (GP-4)
Need for CPD	Both CP and GP were required to refresh knowledge and the skills continuously in CMTM model.	″GP do also need CPD, years after years passed and they do not update their knowledge, there should be a refresher course for GPs too which also teach GP inter-professional collaboration. ″ [GP-4] ″We (CPs) have already refresher courses for our CPs, we have dispensing guidelines. ″ (CP-2)
Accreditation	CPs were required to pass through some accreditation if they want to manage chronic diseases or if they want to polish their clinical skills. MPS, MoH and MMA may take a leading role to offer or evaluate any competency.	″When you put in accreditation, there will be regulation, there will be self-auditing, there will be a body that governs this process and this accreditation should be diseases specific for example, for asthma, diabetes. ″ (CP-3) ″Yeah! definitely, there is no harm in that (accreditation). The basic competency and knowledge in disease specific intervention through an accreditation to enhance the competency and standards and also the

		knowledge of CPs to undertake a specific role. ″ (CP-4) ″From MPS point of view, any professional services must be accredited. If it will be a requirement, we are ready to collaborate with Ministry and medical association to offer or evaluate necessary training and endorsement. ″ (CP-2)
Patient Electronic Database System	An electronic data system for chronic patients would be advantageous and facilitate collaboration. It will also reduce the medication wastage and make a patient easily trackable.	″Without electronic records, we might over dispense them or face difficulty to track patients who get their medications from 2 or 3 different clinics, which may worsen that disease. So, in terms of chronic diseases, I think, it would reduce the wastage of medicines. ″ (GP-3)
		″It is definitely a very good thought of having an electronic data system for chronic disease patient in private healthcare. It will not only solve the problems in error of prescription, but also improve the communication to the pharmacist, it also provides data on how we use drugs, data for research on our prescription pattern, usage of medication″ (GP-4)
Solutions to various barriers		
Limited Pharmacy Operating Hours	KIs suggested limited number operating hours are not a problem when CMTM would be in operation.	″There will be extended hours of pharmacies when they have patients So, it's just a matter of time. ″ (CP-4)
Lack of Appreciation	Lack of appreciation from GPs and even from patients was a perceived barrier for CPs. KIs were of the view that if they would give good advices on medication it would surely be valued.	″They (patients) do not understand how important it is, for them to have a very sound and good advice on medication. Once, they understand then, they would definitely, value that. And when patients value that GP would automatically value that. ″ (GP-3)
Lack of Trust	KIs proposed regular communication would fill the gap of trust.	″Regular interaction and regular meetings may help to build the trust. ″ (GP-1) ″The relevant body, these must come in, if you want MPS, if you talk about the doctors to be MMA, and government must come as well. Let's say have a group of doctors and pharmacists collaboratively working on

		these ideas to come up. We can reduce the gap of trust. ″ (CP-3)
Role Encroachment	KIs shared their experience that if conflict of interest is removed, the problem of overlapping roles may be minimised currently there is the overlapping and role encroachment in Malaysia which should be reduced or overcome for collaboration to become possible.	″Take out the money component. When money is involved, it's encroachment and overlapping. When no money is involved, there is no overlapping and they would love to have pharmacist to follow-up as a team member. ″ (CP-1)
Consumer's Awareness	KIs were of the stance that the consumer's perception can be changed by providing the right information and a professional service which help them to manage their diseases.	″Public need to understand first this move through a mass media campaigns, otherwise the opposition will politicize it. ″ (GP-1) ″Public perceptions can change in seconds, if you could provide the right information, because they know that they will get good treatment outcomes by having two professionals engaged in their health. ″ (N-1)

DS= dispensing separation, MoH= Ministry of Health, MMA= Malaysian Medical Association,

MPS= Malaysian Pharmaceutical Society.