

# Physicians Views on Cardiovascular Disease Risk Prevention Services by Pharmacists and Potential for Collaboration

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## Research article

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# Abstract

**Background:** Cardiovascular diseases (CVD) are the leading cause of mortality worldwide. Early identification and management of modifiable CVD risk factors is highly effective in preventing disease onset and/or improving outcomes in CVD. Pharmacists as highly accessible primary health professionals can assume a role in screening and risk factor management in collaboration with physicians, however such prevention services are not established practice in Saudi pharmacies. Therefore, the aim was to explore physicians' perceptions about the utility of a role in CVD risk screening and management for Saudi pharmacists.

**Methods:** Qualitative semi-structured interviews were conducted, audio-recorded and transcribed verbatim in Arabic or English. All transcripts were thematically analysed after translation into English if required.

**Results:** A total of 26 physicians recruited from public hospitals and primary healthcare centres were interviewed. Most were unaware of pharmacists' potential to undertake a role in CVD risk prevention. Although there was broad support for the concept, they recommended physician-pharmacist collaborative models, extensive provider pharmacist training and strict oversight by the Saudi Ministry of Health/other official authorities to ensure service quality and sustainability, should implementation occur. Healthcare system reform was considered key to expanding private sector (i.e. community pharmacy) involvement in healthcare as was incentivising providers and 'marketing' for patient acceptance.

**Conclusion:** Physicians were positive about setting up a collaborative community pharmacist-physician CVD risk screening and management service model with the help of an authorised body within the Saudi Arabian healthcare system.

## Background

Non-communicable diseases (NCDs) are an emerging health concern worldwide. Amongst NCDs, cardiovascular disease (CVD) is currently the dominant cause of death accounting for almost 30% of global mortality [1]. In Saudi Arabia, NCDs have also taken over from communicable diseases as the major contributor to burden of disease. While the prevalence of NCDs has increased, their prevention and control remains challenging [2, 3]; indeed this is the case globally. New strategies and models of care are now requisite to ensure that evidence-based prevention and treatment measures are utilised by health professionals and patients alike, particularly in the context of developing economies.

Prevention interventions should be situated in primary care, as this is a more effective and cost-effective approach to delivery. However, in some countries, the primary healthcare system and workforce is under-developed compared to the secondary and tertiary healthcare sectors. Healthcare in Saudi public hospitals and publicly funded primary care centres is state subsidised. In contrast, primary care delivered by private practitioners is not subsidised resulting in underutilization and a substantial burden on the secondary and tertiary healthcare sectors [2, 4]. Thus, in the Saudi context, there is an urgent need to

strengthen primary healthcare to save costs, promote healthy lifestyles and prevent and manage chronic conditions.

One of the innovations in healthcare has been task-shifting and task-sharing. This approach is recommended by WHO to enhance healthcare services in developing and developed countries [5, 6]. Task shifting is defined by WHO as *“a process whereby specific tasks are moved, where appropriate, to health workers with shorter training programs and fewer qualifications. Its application leads to more efficient use of existing human resources and easing of bottlenecks in service delivery. Where further additional human resources are needed, task shifting may also involve the delegation of some clearly delineated tasks to newly created cadres of health workers who receive specific, competency-based training.”* Two areas in healthcare which are most likely to benefit from this approach are primary care and rural health. The primary healthcare system may become more efficient by shifting non-medical health tasks conventionally provided only by medical practitioners to other suitably trained allied healthcare professionals (HCPs). Building community pharmacy based healthcare models where pharmacy takes on healthcare roles in partnership with primary health physicians has led to a stronger primary care base in the management of chronic diseases in several countries [7, 8]. Community pharmacies with their long operating hours and wide distribution are highly accessible to the public. Globally, many collaborative care models between pharmacists and physicians to manage a range of chronic diseases and their risk factors, including non-dispensing pharmacists entrenched within general practitioner (GP) practices, have emerged and demonstrated positive health outcomes [9–11].

In Saudi Arabia, with the rising prevalence of chronic diseases such as CVD, and the substantial pressure on secondary and tertiary health system [4, 5], a national policy is needed to support task sharing/task shifting, which can mobilise the underutilized privately owned allied health infrastructure in the primary care sector. For example, some non-medical tasks such as health screening/health education/health coaching may be shifted to allied professionals such as community pharmacists. This would free up time for physicians involved in delivering core and specialised medical tasks such as diagnosing and prescribing.

In order to effect this strategy, interprofessional practice where clear roles/goals, professional identity issues, shared responsibility, interdependence and team tasks are addressed, is important because of the impact on the process of collaboration and patient health outcomes [12]. For example, process evaluation of a feasibility trial of UAE pharmacist-led screening services for diabetes and cardiovascular disease (CVD) risks based in pharmacy, highlighted the need for better integration with primary care physicians to ensure continuity of care following referral of individuals at high risk of CVD or diabetes [13]. Clearly physician support and acceptance of pharmacy provided services is an essential steppingstone to developing such pharmacy service models. In Saudi Arabia, recent ministerial initiatives lend credence to the development and implementation of pharmacy services – a paradigm shift from the traditional ‘supply-only’ role of pharmacists [14].

Although pharmacist led CVD risk screening/management models in Saudi Arabia are a logical step to reducing CVD burden, understanding factors that would likely affect their implementation requires extensive engagement of physicians as key stakeholders. Hence the aims of this study were to examine physicians' views on pharmacists' provision of CVD risk screening and management services and to explore optimal pathways for integrating such models in the Saudi primary healthcare system. The specific objectives were to explore physicians' 1) experience and perspectives about CVD risk management and reduction, 2) perspectives on pharmacists' role or activities in managing patients with CVD and particularly in reducing and identifying CVD risk and 3) experience in working or willingness to collaborate with pharmacists in CVD risk reduction.

## **Methods**

### **Study design and setting**

Using a bilingual interview guide (Appendix A), qualitative semi-structured interviews (face-face and telephone) were conducted in the period between September – November 2017, with physicians who had at least one-year experience in Saudi Arabia as a registered medical practitioner.

### **Interview Design**

The interview guide was developed based on a comprehensive search of the literature, consultation with experts in the field (pharmacy cardiovascular health services) and objectives of the study.

The interview guide consisted of open-ended questions with prompts and was pilot tested before starting data collection (Appendix A). It was also translated into Arabic by a certified translator. Interviews were conducted in English or Arabic depending on participant preference by the primary researcher (HA, MPharm and MPhil, current PhD candidate and experienced in interview-conduct through previous research projects). The interviewer was also a Saudi pharmacist and researcher, conversant with both the Saudi pharmacy context as well as international research on pharmacy roles in CVD risk prevention. We expected that use of a Saudi research team member would facilitate physician participants' recruitment and contextualise pharmacist roles within the Saudi healthcare system (i.e. this would enhance the ontological authenticity of the study) [15]. All transcripts were transcribed verbatim, then any Arabic transcripts were translated back to English with translations cross checked by a certified translator.

### **Sampling And Recruitment**

A purposive, convenience and snowball sampling approach was used [16]. Managers at public hospitals and primary healthcare centres in Najran [a city in southwestern Saudi Arabia] and Riyadh were contacted via email or phone and requested to help by inviting physicians within their organisation to participate by forwarding relevant project materials (purposive sampling). Interested physicians could then contact the

researchers directly. Further, pharmacists who had participated in a previous study [17] were asked to assist in physician recruitment in the current study by forwarding project information to their medical practitioner colleagues in the hospitals or primary healthcare centres. Next, all physicians who participated were invited to forward project materials to any contacts they deemed as meeting criteria (passive snowballing approach). Additionally, physicians known to the research team who met the inclusion criteria, were directly emailed the project information, and if interested, could participate by contacting the researchers (convenience sampling). An exponential passive snowballing technique was employed. This method allowed recruitment of participants who were not known to the research team; this method injects a degree of randomness in an otherwise purposive conveniently sought sample.

The sample size was based on data adequacy, with a premise that around 20–30 participants would be sufficient to yield thematic saturation. The data collection process continued until no new themes emerged. Such a sample size is considered appropriate for qualitative research with a participant group of some common characteristics [18].

## Data Collection

Semi structured interviews were conducted by the primary researcher (HA) with consenting participants on an individual basis. The interviews were audio recorded and supplemented with field notes, at the participant's workplace or other preferred location. Following the verbatim transcription of audio recordings, all data were de-identified by assigning participants a code and using this code for saving audio files, translations and transcripts. After completion of transcription/verification, the coding sheet was destroyed. Further, any words/phrases that could lead to possible identification of a participant were deleted from the transcript.

## Data Analysis

The epistemological approach in the analysis was aligned with post-positivist and interpretive-constructivism paradigms [19]. All interviews transcripts were entered into the QSR NVivo 11 program (QSR International, Cambridge, MA). Interview transcripts were thematically analysed and iteratively coded into themes using a method of constant comparison. All de-identified transcripts were coded by the ground researcher (HA). Additionally, 10% of the transcripts were independently reviewed by an experienced qualitative researcher (BS), followed by a process of synchronising codes through discussion and joint development of a coding framework. Emergent themes were derived from codes and reviewed by other members of the research team (BC and IK) and local co-investigators (TA and NA). Themes were then meaningfully collated and similarities or differences between participant sets (i.e. sociodemographic clusters) were specifically considered. A model to collate thematic findings was then developed after team discussion. For quality assurance, a trustworthiness checklist for high quality data assurance was employed (Table 1). Also, the COREQ checklist was completed for this research study, with most items addressed (Appendix B).

Table 1

Trustworthiness checklist for high-quality data assurance in post positivist qualitative research [19]

Quality indicators in qualitative research	Research processes used to meet trustworthiness criteria
<b>Credibility</b> (Disconfirming evidence)	Note taking, audio recording, data analysis and compilation by independent research team members validate the 'truth' of our data. Where obtained, discordant views are presented in the data analysis.
<b>Transferability</b> (analogous to external validity)	A maximum variation sampling strategy was used to obtain a wide range of views. Further, a clear and comprehensive description of the interview guide and research procedures is provided to ensure repeatability. Thick descriptions where possible are also included in data exemplars.
<b>Dependability</b> (analogous to reliability)	A clear review and detailed discussion were continued between all members of the research team comprising three experienced qualitative researchers and two local (Saudi) co-investigators. Variability in the data was examined during data analysis between participants responses such as whether there were differences between general practitioners, specialists or consultants towards pharmacists.
<b>Confirmability</b> (analogous to objectivity)	A subset (10%) of the transcripts were independently coded by two members of the research team (HA and BS) to create the coding framework. Then, theme derivation and potential thematic structure were discussed by all the research team (including experienced qualitative researchers BS, BC and IK and Saudi co-investigators and experienced local researchers TA and NA) until agreement was reached.

## Results

A total of 26 physicians from public hospitals and primary healthcare centres in Saudi Arabia were interviewed either face-face (n = 22) in clinics or workplaces or via phone (n = 4). The interviews ranged between 24–52 minutes in duration. Almost half of the participants were Saudi citizens (50%) and most were male (96%). More details about participants demographics are highlighted in Table 2 below. All interview records were clearly audible and no repeat interviews were required.

In general, the frequently observed CVD risk factors reported by participants included diabetes, hypertension, smoking, obesity, physical inactivity and dyslipidaemia. Screening for CVD risk and/or risk factors was not considered routine practice in Saudi Arabia, apart from some health promotion advice during a typical physician clinic consult, along with point-of-care testing during public health awareness campaigns by physicians and nurses. Most physicians were not aware of any standardised Saudi guidelines for CVD risk screening and management, hence the guidelines they followed varied.

Table 2  
Participants Characteristics

Characteristics	Variables	N = 26 (100%)
Gender	Male	25 (96)
Age (Years)	25–34	10 (38)
	35–44	9 (35)
	45–54	4 (15)
	55–64	1 (4)
	≥ 65	2 (8)
Experience (Years)	< 2	2 (8)
	2–5	8 (30)
	6–10	8 (30)
	11–15	1 (4)
	16–20	2 (8)
	21–25	2 (8)
	> 25	3 (12)
Speciality/WORKPLACE	Cardiology	7 (27)
	Internal Medicine	9 (35)
	Emergency Medicine	4 (15)
	Family Medicine	2 (8)
	Primary Care	4 (15)
Nationality	Saudi	13 (50)
	Sudanese	3 (12)
	Yemeni	3 (12)
	Egyptian	2 (8)
	Syrian	1 (4)
	American	1 (4)
	Indian	1 (4)
	Jordanian	1 (4)
	Palestinian	1 (4)

Characteristics	Variables	N = 26 (100%)
Workplace city	Najran (Southern region)	14 (54)
	Riyadh (Central region)	9 (35)
	Dammam and Qatif (Eastern province)	2 (8)
	Jeddah (Western region)	1 (4)

Most participants stated routine clinical investigations based on presented symptoms were mainly followed to assess and manage CVD risks and complications.

*“We [physicians] are following the American Diabetes Association [guidelines] for treating our patients. There is a separate section for treating and controlling the other factors to prevent cardiovascular disease....” (Dr14, 5 years)*

*“To be honest, I do not use any screening guidelines or tool for CVD risk, I know there are international guidelines, but I am not aware of any local Saudi guidelines.” (Dr20, 2 years)*

The analysis yielded four key themes: physicians’ perception of pharmacists’ role, perception of critical success factors, suggested models of care and healthcare system reform.

## Theme 1: Physicians’ Perception Of Pharmacists’ Role

Physicians’ perceptions of pharmacists’ roles were based on current experience and in their discussions, they also raised potential future roles relevant to the research question.

### Current pharmacist roles

Most participants perceived that pharmacist’s roles in Saudi Arabia were limited to medication supply, while a few participants noted that some pharmacists participate in health promotion campaigns. Several participants were also aware of patient education programs for people with chronic diseases, including diabetes and hypertension being provided in a few community pharmacies.

*“In Saudi Arabia, the role of the pharmacist is restricted to dispensing medications prescribed by the doctors.” (Dr1, 2 years)*

*“They [community pharmacists] sometimes check and screen blood pressure on the machine, but I don't think they do an official referral to doctors....” (Dr17, 6 years)*

*“You know some pharmacies such as X and Y [big chain pharmacies] have already started providing initial health education sessions on specific topics such as hypertension and diabetes in a few community pharmacies.....” (Dr2, 2 years)*



## Future pharmacist roles

Most participants were positive and supported future CVD risk screening and management services in community pharmacy and many lauded the novelty and potential utility of such models. They pointed to advantages of community pharmacy such as long opening hours, easy accessibility and frequent consumer contact, compared with hospitals and primary healthcare centres, as reasons for their support.

*“They [community pharmacists] can do these screening services because there are some pharmacies open 24 hours, in the health centre there is limited opening time but, in the pharmacy, people can go there any time to check, so it is good.” (Dr13, 22 years)*

*“They [the public] will love it because from our experience in the campaign, even the pharmacist inside the pharmacy, they measure the blood pressure, height, and weight. The people like it very much and they ask for it. When we are inside the campaign, you cannot imagine the number of people in queue just to measure their blood pressure....” (Dr8, 35 years)*

Some participants commented on the wider patient catchment that such pharmacy models could service thereby increasing the chance of identifying those at CVD risk in a timely manner.

*“Applying the protocol only inside our hospitals, we will catch only the top of the iceberg of those having risk factors, but if we spread this [screening] protocol to other dimensions, such as community pharmacies, it will cover a new dimension of this target population; i.e. those having CVD risk factors.” (Dr8, 35 years)*

In contrast, some participants did not believe that pharmacists had the ability to offer such services and appeared hesitant in accepting possible CVD risk screening in community pharmacies. In addition, a few physicians had unsupportive attitudes and expressed discomfort with the extension of pharmacist services into patient centred care. The commercial nature of pharmacy premises was perceived as an ethical barrier.

*“I don't think even they [community pharmacists] are up to the level that they have been educated to provide such education to the patients.” (Dr18, 37 years)*

*“At the beginning, I think they [community pharmacists] will find difficulties from the doctor to accept pharmacist to interfere in their job or in risk screening and management, but in the future if the point become accepted, this will be better.” (Dr5, 5 years)*

*“There is no communication between physicians and pharmacists. Physicians wouldn't feel comfortable asking pharmacists. Most physicians would say who is the pharmacist ....” (Dr1, 2 years)*

## Theme 2: Perception Of Critical Success Factors

In talking about future services, many participants highlighted what, in their view, would be essential initial steps to ensure the success of future pharmacy services for CVD risk prevention and management.

## Public acceptance and creating patients demand

Participants suggested that the public must be made aware of the availability and significance of pharmacy-based services to enhance acceptance and participation in these services. Initial resistance to consumer engagement with pharmacy services was predicted, but this may resolve as such services become more commonplace. In addition, it was suggested that role clarity of physicians and pharmacists' tasks within these screening services might lead to more acceptance and collaboration from physicians. Gender issues were also mentioned, given religious and social mores about gender segregation.

*"There needs to be more education for the public to raise awareness of such services and clarify the service model to physicians and what are their roles." (Dr7, 7 years)*

*"I think if there is a good system to control this process, in other words, clear role for pharmacists and clear role for physicians and how they operate together to end up with management and reduction of cardiovascular diseases and risks...." (Dr19, 7 years)*

*"May be, here in Saudi Arabia, if the pharmacist is male and person is female, maybe it is difficult to check blood pressure, or she will not accept...." (Dr15, 6 years)*

## Resources and task planning

Clear service protocols, simple screening tools and guidelines were mentioned as important factors during the planning and implementing of such pharmacy services. Also, training for pharmacists for quality assurance was considered essential. Ministerial supervision from the Saudi Ministry of Health or other authorised bodies was mentioned frequently by participants. Participants commented about the need to modify pharmacy layout to better accommodate such services – for example the need for seating areas and private counselling areas were seen as important for patient comfort. Many participants suggested running service pilots in selected areas and if proven acceptable and effective, to then scale-up the provision nationally.

*".... If there is some supervision from the Ministry of Health or Saudi FDA on these pharmacies and their tools and their practice, it will be a very nice idea, I totally agree it will be a breakthrough." (Dr8, 35 years)*

*"They [community pharmacists] have to change their way of dispensing ...., for example in Europe, you will find that customer when he comes, he sits on a chair and then give his medication list. Then the pharmacist goes and collects it and sits with him, has a dialogue as a person to person while in our system, no, it is just like a supermarket..." (Dr18, 37 years)*

*"... The bottom line, it is too early to implement it in pharmacy nationally and plans to do it should be done in small area to be measured and evaluated and shown effective results." (Dr19, 7 years)*

## **Legislation and incentivisation**

From a system's perspective, legalising the provision of pharmacy services by the Ministry of Health or other regulatory bodies was perceived to be a key facilitator, along with media support for successful pharmacy service pilots. Empowering allied HCPs in Saudi Arabia was recommended by some participants to enable provision of optimal collaborative patient care. Financial incentives and motivational rewards for pharmacists and pharmacy owners were suggested as essential for sustainability and quality of pharmacy-based services. This would enhance commitment to service quality by pharmacy owners and pharmacists, an essential first step for winning public trust.

*"I think they [pharmacists] should have to get official legal support from Ministry of Health, also they [pharmacists] should have support from the media newspapers, and twitter, and once that just elicited even awareness for whole society..." (Dr23, 7 years)*

*"I think we should review the whole national program for empowering professionals, I would say empowering the pharmacist and empowering the nurse staff, empowering these hidden professionals, I mean, heroes of the health services." (Dr8, 35 years)*

*"... They [community pharmacists] could receive monetary incentives or any other kinds of overtime incentive." (Dr2, 2 years)*

## **Theme 3: Suggested Models Of Care**

Models of care suggested by participants included: 1) pharmacist delivered health education/health promotion (on lifestyle modification and CVD risk reduction) to improve health literacy, 2) point of care testing 3) medication review, 4) being part of the home care visit team - all with clear communication and collaboration with physicians. Care provision formats suggested by the participants included Internet and tele-consult models besides face to face models delivered in the community pharmacy setting.

*"Health literacy is the problem here in Saudi Arabia, you may need somebody in the community pharmacy to educate these people in the society with healthy lifestyle habits" (Dr21, 35 years)*

*"Pharmacists should have an effective role in the society by providing consultations to people through the internet on social media and or via the phone....." (Dr1, 2 years)*

*"It will be beneficial if they [community pharmacists] can do BP or BGL or lipid profile tests...." (Dr24, 1 year)*

*"As long as there's a pharmacy clinic, patients would bring their medications whether vitamins, herbal medications or whatever and they [pharmacist] will ask how they [patients] them all and [explain] what*

*are their [medications] benefits.... possible contradictions.....” (Dr1, 2 years)*

*“It [involving pharmacists within the home care visits team] will be better because they [pharmacists] could go and see how the patient is handling the drugs, how the patient is tolerating the drugs, is he compliant by tablet counting or whatever and is he taking the drugs on a proper time.....” (Dr18, 37 years)*

It was recognised that collaborative (physician-pharmacist) models were not yet the norm in Saudi Arabia. Most participants recommended enhanced collaboration of pharmacist with physicians with clear role definitions for pharmacists. The most common model suggested was a progressive stepped care collaborative service model (Fig. 1). It was suggested that pharmacists risk assessment and education could lead to a pathway for targeted referrals to dietitians, primary and/or tertiary care physicians.

*“... Pharmacist and doctor collaboration is still not well established in Saudi Arabia.” (Dr5, 5 years)*

*“... They [community pharmacists] will do screening or risk assessment, and what is the pathway after, for example, if GP diagnose a patient with diabetes, what is next? ....There should be clear in system, what they will do, and how can they handle it. I think it is doable and even time saving and will help us, and this is not that difficult things. It can be done even nationally.” (Dr23, 7 years)*

*“If there is good collaboration between pharmacists, general practitioners and cardiologists especially in the screening or risk factor assessment, this will limit costs by the government or by the people themselves....” (Dr5, 5 years)*

While some participants expected community pharmacists to provide a full-service ranging from CVD risk screening, referral, patient’s education to long term follow ups, a few thought community pharmacists’ roles should be limited to point of care tests and patient education. Documentation during service provision was thought to be essential for quality assurance and improvement.

*“There can be a simplified screening tool the pharmacists could use and once they see a mild-risk no need for referral, moderate-to-severe risk, he has to be referred. So that would .....save the time for doctors to see moderate-to-high risk rather than seeing only the mild patients.” (Dr17, 6 years)*

*“I think providing education to patients is enough for pharmacists. Because if you want to do the scoring, they [pharmacists] have to see the file, but usually no, especially in the community pharmacy...” (Dr18, 37 years)*

*“Pharmacists have to document everything to facilitate these services and that will help evaluating them.” (Dr22, 1.5 years)*

## **Theme 4: Healthcare system reform**

Participants noted several issues with the limited structure of the primary healthcare system. Most people lacked family physicians with the generic help seeking pattern for most issues being presentations at

tertiary hospital – where medical care was publicly funded. Also, participants felt that community pharmacies operated separately from the public primary healthcare system. Thus, participants suggested that a system-wide linkage may improve the public perception of the importance of primary healthcare including their family physicians and pharmacists. For instance, to optimise patient a national electronic health record system was needed, it should be accessible to community pharmacists and other HCPs and used nationally with better patient record management and seamless transitions between health settings.

*“Other point, our GP system is weak here in Saudi Arabia. There is no GP-patient connected directly to the consultant and specialists. There is no clear structure for GP in Saudi Arabia ....” (Dr23, 7 years)*

*“I think community pharmacy should be connected by a system to primary care centres and hospitals.....” (Dr20, 2 years)*

*“They [policymakers] should reform the current health service situation towards a community-oriented health providing services. This means they should do some form of legislation for all health services.....” (Dr8, 35 years)*

*“They [MOH] will do all of that with the national system connected by the Saudi ID. The United Health files.” (Dr12, 16 years)*

Many participants suggested that given community pharmacies operated privately, there should be a public-private mixed model approach in Saudi healthcare system, which would also require system reform. Involving community pharmacies with publicly operated primary healthcare centres might increase the public awareness and enhance primary care service use in Saudi Arabia.

*“So, they [health consumers] tend not to go to the primary healthcare clinic anymore and I think that is an issue we are having with our health system.” (Dr20, 2 years)*

*“That is what we are trying in PHCs [Primary Health Centres] to provide another model of care including the community and at least the whole community including all health services, all health providers including community pharmacies to be involved in a good well-built national protocol to deal with this as a national tragedy.....” (Dr8, 35 years)*

Overall, the data were analysed to explore any differences between participants responses based on experiences, type of workplace and nationality. Though there no much differences found based those variables, more experienced participants had better articulated and pragmatic responses.

## **Discussion**

This is the first study that has explored physicians’ views on CVD risk screening and management services by community pharmacists in Saudi Arabia. Our results indicate that participating physicians generally perceived the current role of pharmacists to be mainly medication supply, with a few participants suggesting minor roles in patient education, which they believed were currently provided only

in few community pharmacies. Most participants were positive about the idea of pharmacists enacting future roles in CVD risk screening and management by pharmacists. However, perceived critical factors that would support the feasibility and success of such roles included the need for wider public acceptance, thorough resource and task planning, legislative frameworks and financial or other motivational awards for such pharmacist providers. The gist of the discussions with these participants highlighted that their thinking aligned with a hierarchical model of care with medicine/medical providers allocated leadership positions in patient care. Within this vertically linear model, participants perceived that pharmacists could take on initial brief assessment of CVD risk and refer patients to primary care or specialist physicians, with the referral chain being mono-directional, i.e. pharmacist to physicians only. Healthcare reform that allows and recognises pharmacy service provision in collaborative or public-private partnership models was perceived to be needed to develop pharmacists' services in the area of cardiovascular health in Saudi Arabia. Perhaps only such systemically entrenched models of shared care can facilitate collaborative care provision by pharmacist for patients with CVD risk. The thematic architecture developed from the data aligned well with the study aims and presents a pragmatic way forward towards the goal of improving CVD risk screening and management services as highlighted in Fig. 2.

At a 'macro' level, our participants highlighted many current limitations in the Saudi primary healthcare system. A lack of system-imposed structure where people start their healthcare journey through primary care, and the known shortage of family physicians/GPs were clear barriers identified by participants. Patients typically by-passed primary care presenting directly at tertiary hospitals, often for minor health concerns as has previously been reported [20, 21]. While the Saudi Ministry of Health is reforming primary healthcare as part of its 2030 Vision [22], involving privately owned community pharmacy, with their privately owned and sustained infrastructure in a primary care network with publicly funded primary care would make the system more efficient. This would require changing public perception about the importance of primary healthcare, including their family physicians and pharmacists. Also, a national electronic health record system was suggested to optimise patient care that is accessible by community pharmacists and other HCPs and used nationally for patient care continuity [23, 24]. Further recommendations included task shifting non-medical tasks, such as CVD risk screening and health education to patients with CVD risk, which would be beneficial both clinically and economically [25, 26]. Thus, policies that allow task shifting interventions and services for CVD risk reduction and management are needed. Such changes should obviously be system supported and incrementally established using key principles of implementation science.

The next layer of change needed would be at the level of medical professionals who have been conventionally charged with providing most roles in healthcare in Saudi Arabia. Overall, the potential of pharmacists in delivering health services was underestimated; this has been shown in other studies [27, 28]. When ideas around collaboration in CVD were tendered by participants, it was clear, participants wanted patients referred to them, and did not voice intentions of referring patients to pharmacists for counselling/follow up/health education. This phenomenon of medical dominance has been reported by similar research in other countries, including those with highly developed and differentiated pharmacy

workforce set up [29]. In contrast physicians have been reportedly supportive about pharmacists' roles in CVD risk reduction services as was the case in our study [30, 31]. Interestingly, a survey of Malaysian physicians reported that more than half the participants were in favour of community pharmacist's roles in general patient education, but only a third were positive regarding comprehensive smoking cessation roles provision by community pharmacists [32]. This aligns with the physician participants in our studies and implies that while at a generic level, collaboration is espoused as a value, but when specific clinical roles are discussed, physicians may be rather unsure of pharmacists' capabilities.

Clearly then, there is a possible gap between how medical professionals 'think' and the way that systems are set up for them to actually 'enact' collaborative shared care for patients with CVD risk. This would be the case for settings such as Saudi Arabia. Hofstede's 6D© model of 'culture' clearly identifies Saudi Arabian culture as very hierarchical, where hierarchical structures are established and accepted, and decision-making power is centralised [33]. Apart from a culturally fed system of medical hierarchy, lack of well-established pharmacist-physician collaboration may lead to underestimation of pharmacists' role and ability, both in hospital but particularly for community pharmacy settings.

One way to facilitate change in healthcare may be to use principles of effective innovation, such as the 'Kaizen principle' [34]. Kaizen, (a Japanese word for good (zen) change (kai), implies that innovative changes should be incremental, but undertaken continuously, which leads to most successful implementation, rather than large changes implemented immediately [34]. Given that participants in our study highlighted the acceptability of receiving patients referred to them by pharmacists, implementing such a model may offer a path of least resistance. Once this is an established model, adding in the extra step of requesting physicians to refer patients back to pharmacists may be added to the initial model, allowing pharmacists to be able to provide holistic disease management services to patients with CVD risk or with CVDs.

"Wasfaty", a recently introduced initiative aims for medication dispensing for patients who have been seen by physicians in a public healthcare setting (hospital or primary healthcare centre) in Saudi Arabia, from a private community pharmacy, can be used for such 'back-referrals' to the pharmacist, particularly after 'Wasfaty' has been well entrenched in the healthcare system [14]. Another way to scaffold the implementation of new service models by community pharmacists as suggested by some study participants [22] would be to have strategic and powerful social marketing campaigns by the pharmacy profession to create awareness and acceptance of the level of pharmacist training, as well as their demonstrable capabilities and willingness in healthcare delivery. These would be useful both for the public and for other health professionals.

Finally, intra-professional changes are needed within the pharmacy profession as well. Key issues the profession needs to resolve are resources, task planning, supportive frameworks (legislative and professional) and remuneration pathways for health services to be performed. Having these frameworks in place would enhance public or other health professional trust in future pharmacy services [35]. Our study participants also highlighted resources and tasks planning for future pharmacy services as

essential in defining clear roles for pharmacists, physicians and other HCPs. Resources include professional training for pharmacists, patient education materials, systems for documenting information provided. Within pharmacies, allocating a private space for consultation, delegating staff to work on services and managing service provision whilst routine activities are in operation would be factors to consider [36]. The actual health service design would need to clearly identify roles for different professionals as well as optimal referral pathways. Further, as pointed out by our participants, financial remuneration and oversight of service delivery by the Ministry of Health or other authorised bodies should be important considerations.

The strength of this study is that it provided insight into physicians' views of current and future pharmacy services using CVD risk screening and management as a case study. The results may inform the development of enhanced interprofessional roles between pharmacists, physicians and other HCPs in Saudi Arabia and similar countries. As a result of our maximum variation sampling strategies, our sample included different age groups, experiences, specialities/workplace or city and nationalities of participants. There were more participants recruited from the capital city, Riyadh and a relatively less developed regional city, Najran, in the south of Saudi Arabia; hence not having a sample that represented rural/remote areas may be a limitation. Another limitation may be the limited participation of female physicians in the study; possibly one reason was that the primary researcher who conducted interviews was male. As a result, elaborated views about gender issues in pharmacy services may not have been obtained. Finally, we did not have participants involved in verifying their transcripts or in co-analyses of data. All participants were offered the opportunity to opt into receiving a summary of the results, but none took up this option, perhaps due to work related time pressures.

## **Conclusion**

Our study explored physicians' views about CVD risk screening and management services by pharmacists in Saudi Arabia. The comprehensive results can guide future pharmacy service planning in Saudi Arabia. The study has also highlighted the need for stakeholder engagement at inception in the future development, implementation and evaluation of Saudi community pharmacist services in CVD risk assessment and management services. Most participants were positive about setting up a collaborative community pharmacist-physician CVD risk screening and management service model with the help of an authorised body within the Saudi Arabian healthcare system. In addition, healthcare system reforms were recommended to address issues including primary care system issues and introducing private public partnership.

## **Declarations**

### **Ethics approval and consent to participate**

Ethics approval for the study was obtained from the University of Sydney Human Research Ethics Committee (HREC) (2017/614). Participants consent were obtained prior each interview.



## Availability of data and materials

All materials including data collection guide and COREQ check list used during this study are included in this article and additional files in the appendix A and B.

## Consent for publication

Not applicable

## Competing interests

The authors report no competing interest.

## Funding

No funding received for this study

## Authors' contributions

All authors were involved in the design of the study, data collection, analysis and interpretation of the findings and preparation of the manuscript. All authors have read and approved the final manuscript

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Not applicable

## Authors contribution

All authors were involved in the design of the study. HA, BS, BC and IK participated in interview guide design and content. HA conducted data collection. HA and BS performed data analysis and interpretation of the findings and preparation of the manuscript. All authors have read, edited and approved the final manuscript.

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## Figures

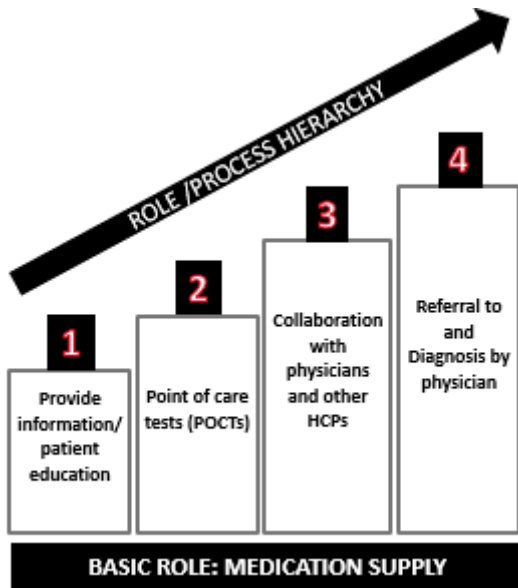


Figure 1

### Suggested models of care

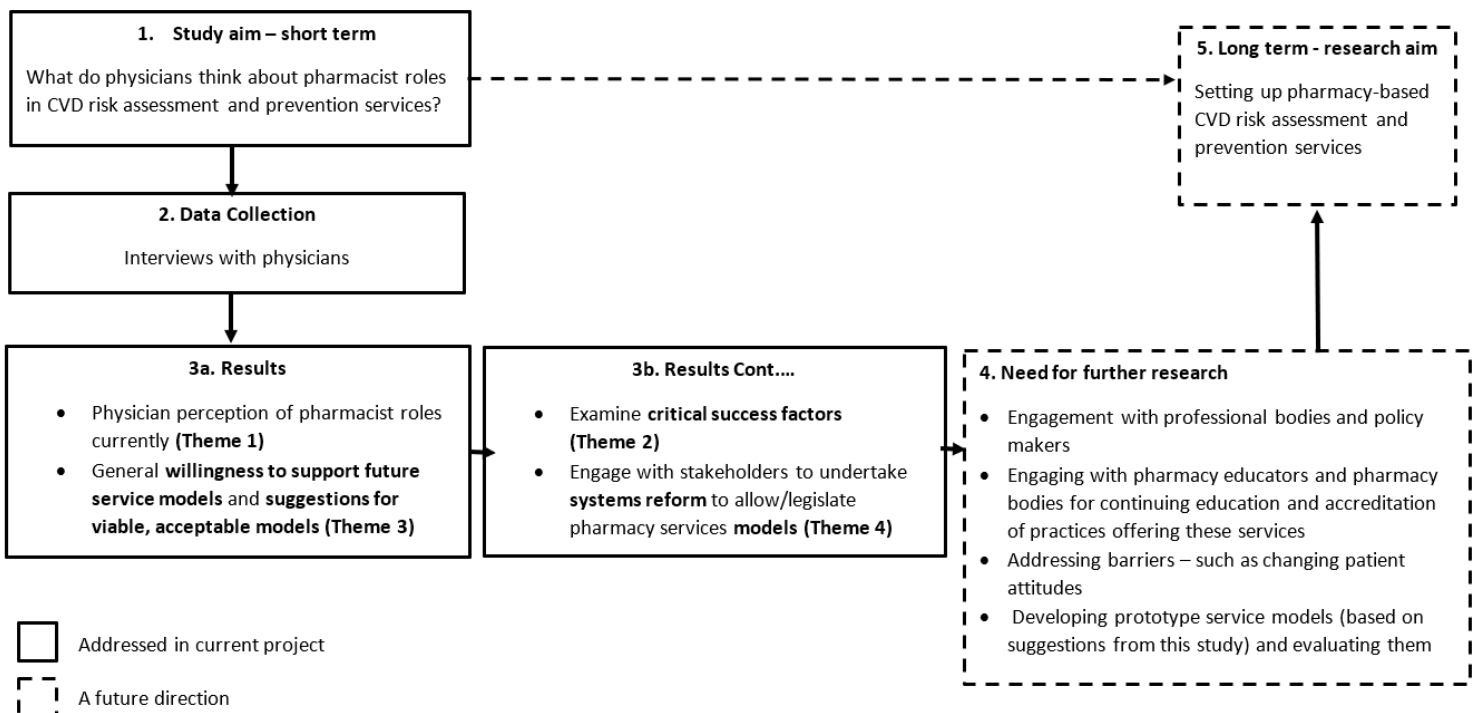


Figure 2

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [AppendixBCOREQChecklist.docx](#)
- [renamed7b39b.doc](#)