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# Key stakeholders' views on the potential implementation of pharmacist prescribing: a qualitative investigation.

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2020



1                   **Key stakeholders' views on the potential implementation of pharmacist prescribing:**

2   **A qualitative investigation**

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20    **Declarations of interest:** None.

21 **Abstract**

22 **Background:** An accumulation of international evidence demonstrates that pharmacist prescribing is effective,  
23 safe and well-accepted. While there is potential for such development in the Middle East, the majority of  
24 published studies are largely reported from Western countries and the perspectives of individuals in strategic  
25 positions of policy and practice in the Middle East were unknown.

26 **Objective:** To explore the views of key stakeholders in Qatar regarding the potential development and  
27 implementation of pharmacist prescribing.

28 **Methods:** Qualitative, face-to-face semi-structured interviews were conducted with stakeholders in strategic  
29 positions of policy influence (i.e. medical, pharmacy and nursing department directors, health-related  
30 academics, patient safety and quality directors, professional regulators). Stakeholders were recruited via  
31 purposive and snowball sampling. The interview schedule was constructed from an extensive literature review  
32 and grounded in the Consolidated Framework for Implementation Research (CFIR) to ensure comprehensive  
33 exploration of potential facilitators and barriers. Interviews were conducted from April to August 2017, digitally  
34 recorded, transcribed, and independently analysed by two researchers using CFIR as a coding framework.

35 **Results:** Thirty-seven interviews were conducted with directors of medicine (n=5), pharmacy (n=6) and nursing  
36 (n=5), healthcare policy developers (n=6), healthcare academics (n=9), and patient safety advocates (n=6).  
37 Interviewees were aware of pharmacist prescribing models internationally and generally supported development  
38 and implementation in Qatar due to perceived benefits of improved patient care, professional development and  
39 enhanced team working. While there were more facilitators than barriers, it was clear that there was a  
40 requirement to systematically plan the development and implementation of pharmacist prescribing, with  
41 reference to all five CFIR domains. The need for further training, demonstration of pharmacists' prescribing  
42 competence, and extensive engagement of stakeholders were considered crucial.

43 **Conclusion:** There is potential for pharmacist prescribing to be developed and implemented in Qatar. Further  
44 research is warranted to define the models of prescribing suitable for Qatar, and to highlight issues of education,  
45 training and accreditation.

46 **Keywords:** prescribing, clinical pharmacy, implementation, pharmacist, Qatar

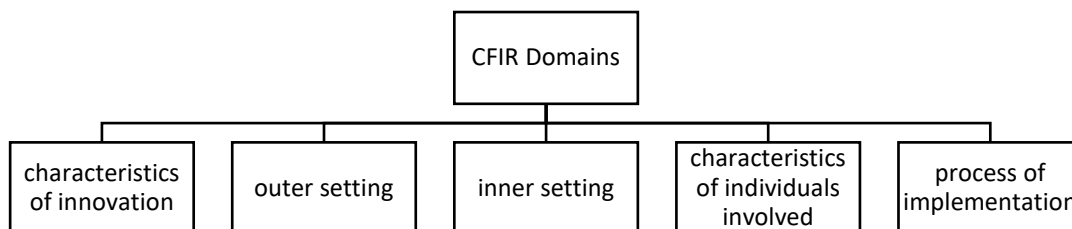
## 47 **Introduction**

48 Prescribing by pharmacists has been implemented in several countries including the United Kingdom (UK),  
49 United States of America (USA), Canada, and New Zealand.<sup>1</sup> While the specific prescribing legislation varies  
50 from country to country, the three main models are independent prescribing, supplementary prescribing, and  
51 collaborative prescribing.<sup>2</sup> According to the UK Department of Health (2006), the aims of non-medical  
52 prescribing (i.e. prescribing by suitably qualified health professionals other than doctors and dentists) in the UK  
53 are to: improve patient care without compromising patient safety, make it easier for patients to get the medicines  
54 they need, increase patient's choice in accessing medicines, make better use of the skills of healthcare  
55 professionals, and contribute to the introduction of more flexible team working across the National Health  
56 Service.<sup>3</sup>

57 There is increasing evidence of the effectiveness and safety of pharmacist prescribing derived from systematic  
58 reviews and meta-analyses.<sup>4</sup> A Cochrane review of 46 studies (37,337 participants) of prescribing by  
59 pharmacists (20 studies) and nurses (26 studies) compared to medical prescribing was conducted.<sup>5</sup> It concluded  
60 that pharmacist and nurse prescribers, practising with varying but high levels of prescribing autonomy, in a  
61 range of settings, were as effective as usual care by medical prescribers for a range of acute and chronic  
62 conditions.<sup>5</sup> A more recent systematic review of pharmacist prescribing compared to medical prescribing in the  
63 hospital setting (15 studies) reported equivalent or improved outcomes for blood pressure, cholesterol, glucose,  
64 anticoagulation, satisfaction, and medication adherence.<sup>6</sup> Stakeholders' views and experiences of pharmacist  
65 prescribing implementation have also been consistently positive, as reported in a systematic review of 65  
66 studies.<sup>7</sup> Twenty-nine studies were conducted prior to implementation, 35 post-implementation, and one was  
67 conducted both pre- and post-implementation of pharmacist prescribing. The overwhelming findings of this  
68 review were encouraging, particularly in relation to increased access to healthcare services, perceptions of  
69 improved patients' outcomes, better utilisation of pharmacists' skills and knowledge, improved job satisfaction,  
70 and reduced physicians' workload. Concerns were largely identified pre-implementation and were around  
71 organisational issues and perceived lack of pharmacists' diagnosis skills.<sup>7</sup> One limitation of the studies included  
72 in this review was that all were conducted in the Western world; hence, the findings may not be generalisable or  
73 transferable to other regions with differing healthcare systems, ethnicity, culture, and work practices.  
74 Furthermore, none of the studies applied implementation theory to the research design, data collection or  
75 analysis hence may not have comprehensively captured all relevant factors. There was also a paucity of  
76 qualitative studies hence a lack of depth and richness of findings.<sup>7</sup>

77 The need to consider theory in developing and implementing interventions such as pharmacist prescribing is  
78 articulated in the UK Medical Research Council (MRC) Framework for Developing and Evaluating Complex  
79 Interventions.<sup>8</sup> According to this framework, a new model of prescribing would be considered a 'complex  
80 intervention' given the number of groups and organisational levels affected, the degree of behaviour change  
81 required and the number and variability of outcomes. Embedding implementation theory throughout the  
82 development and implementation stages is likely to lead to more effective, efficient, and sustained change  
83 compared to a more pragmatic approach.<sup>9</sup> The Consolidated Framework for Implementation Research (CFIR)  
84 was developed in an attempt to simplify the selection of the most appropriate implementation theory from the  
85 multitude of theories, many of which have different terminologies, are often overlapping, and lack one or more

86 key elements. CFIR is a synthesis of 18 published models, theories, and frameworks that facilitate translation of  
 87 research findings into practice.<sup>10, 11</sup> Figure 1 summarises the five CFIR domains which can positively or  
 88 negatively influence implementation: characteristics of innovation being implemented into a particular  
 89 organisation, outer setting (economical, political, and social context within which an organisation resides), inner  
 90 setting (structural, political, and cultural context through which implementation process will proceed),  
 91 characteristics of individuals involved, and process of implementation.<sup>10, 11</sup> CFIR may, therefore, enable a more  
 92 comprehensive consideration of key issues related to the development and implementation of pharmacist  
 93 prescribing.

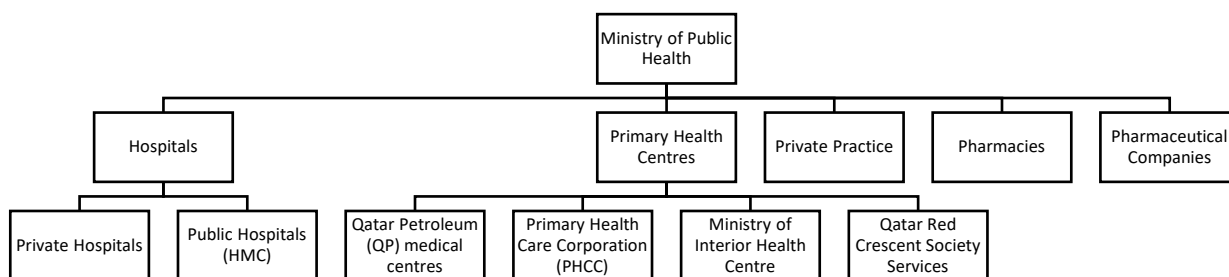


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Figure 1: CFIR domains

96 The State of Qatar, a peninsula situated halfway along the western coast of the Arabian Gulf, has had the highest  
 97 gross domestic product (GDP) per capita globally for the past 10 years.<sup>12</sup> Over this period, Qatar has taken  
 98 action to transform the healthcare system (Figure 2) in order to achieve better patient care outcomes for current  
 99 and future generations, as outlined in its National Vision 2030 and National Health Strategy. One aim is to  
 100 establish “a comprehensive world-class healthcare system”, with emphasis on shifting care from secondary and  
 101 tertiary settings to primary care and better utilise the skilled and motivated workforce, including pharmacists.<sup>13-</sup>  
 102 <sup>16</sup> There is, hence, the potential to embed pharmacist prescribing within healthcare settings in Qatar. This study  
 103 aimed to explore the views of key stakeholders on the potential of developing and implementing pharmacist  
 104 prescribing in Qatar.



105

106

Figure 2: Healthcare system in Qatar

107

108

## 109 **Methods**

### 110 **Study design**

111 A qualitative approach was selected in an attempt to obtain in-depth perspectives key stakeholders. Semi-  
112 structured interviews were chosen over focus groups for several reasons including the desire to obtain individual  
113 rather than collective views and the logistical difficulties of scheduling focus groups with high profile  
114 participants.

### 115 **Settings**

116 Data generation took place in Qatar, across all major organisations and institutions relating to the practice,  
117 education, regulation and governance of pharmacists. These comprised of the Ministry of Public Health  
118 (MoPH); primary, secondary, and tertiary healthcare settings; community pharmacies; and all healthcare  
119 academic institutions providing medicine, nursing, pharmacy, and pharmacy technician education programmes  
120 in Qatar.

### 121 **Inclusion and exclusion criteria**

122 The intention was to generate data representing all key stakeholder groups in Qatar, including experts in their  
123 respective fields with policy influence relating to the development and implementation of models of care. The  
124 groups targeted were individuals in key strategic positions of policy influence “(i.e. medical, pharmacy and  
125 nursing department directors, health-related academics, patient safety and quality directors, professional  
126 regulators). These stakeholders were recruited from: the Ministry of Public Health; the largest governmental  
127 hospital group; the largest governmental and private primary healthcare settings; the different governmental and  
128 private academic healthcare institutes; and the largest private community pharmacy chains.

### 129 **Sampling and sample size**

130 The sampling frame included all individuals meeting the inclusion and exclusion criteria. Names and contact  
131 details were collated by the research team members based in Qatar, using their professional networks. Purposive  
132 sampling, representing diversity of years of experience and country of professional training, was adopted. This  
133 allowed identifying and approaching those individuals most likely to contribute to the achievement of the  
134 research aim and provide valuable insight through multiple perspectives. In addition, snowball sampling was  
135 also used to ensure that no key individuals had been omitted, by asking each interviewee to recommend others  
136 that they thought important to include. Recruitment continued to the likely point of data saturation for each  
137 stakeholder group (i.e. the point at which no new themes emerged).<sup>17</sup>

### 138 **Interview schedule development**

139 The semi-structured interview schedule was drawn from a comprehensive literature review, an umbrella review  
140 of systematic reviews on non-medical prescribing and the systematic review of views and experiences  
141 conducted by the research team.<sup>4,7</sup> CFIR<sup>10</sup> was incorporated into the interview schedule to ensure

142 comprehensive coverage of key factors related to development and implementation of pharmacist prescribing.  
 143 The schedule was reviewed for credibility by members of the research team prior to piloting with five healthcare  
 144 academic and practice-based stakeholders, who were subsequently excluded from the dataset. No changes were  
 145 made based following the pilot interviews hence these were included as part of the dataset. An overview of the  
 146 interview schedule questions and alignment to the research questions and CFIR are presented in Table 1.

Table 1: Semi-structured interview key questions		
Research questions	Related theory constructs	Interview questions
What are stakeholders' awareness, experiences and views of prescribing by non-medical health professionals with a focus on pharmacists?	Intervention Characteristics	Are you aware of the possibility of prescribing by health professionals other than physicians?
What are stakeholders' views and perceptions of clinical roles of pharmacists in Qatar?	Inner Setting	How do you feel about current programs/practices/process that are available related to current clinical pharmacist roles in Qatar?
What are stakeholders' views and perceptions of expanding the remit of pharmacists in Qatar to include prescribing?	All 5 domains	What do you think about implementing pharmacist prescribing in Qatar?
	Inner Setting	Do you think implementing pharmacist prescribing will meet the health needs of the Qatari community?
What are the stakeholders' views and perceptions of facilitators, barriers and solutions to the development and implementation of pharmacist prescribing in Qatar?	Process	What kind of changes or alterations do you think will need to be made to successfully implement pharmacist prescribing in Qatar?
	Outer Setting	How do you think patients will respond to pharmacist prescribing?
	Inner Setting and Characteristics of Individuals	How confident do you think your colleagues feel about implementing the intervention?
	Inner Setting	To what extent might the implementation take a backseat to other high-priority initiatives going on now?
	Inner Setting	Do you expect to have sufficient resources to implement and administer the intervention?

### 147 Data generation

148 From April to August 2017, all potential stakeholders were invited via email to participate and provided with  
 149 detailed study information. If agreeing, a convenient location, date and time for interview was negotiated.  
 150 Interviews of approximately 45-60 minutes were conducted by a trained researcher with a background in  
 151 pharmacy. Probes, such as 'can you tell me more about that' and 'what did you mean when you said...' were  
 152 used throughout the interviews to obtain detailed responses and explanations. Interviews were digitally audio-  
 153 recorded and transcribed *verbatim* as soon as possible following completion of the interview. All interviewees  
 154 were offered the opportunity to review the transcripts to promote credibility and dependability.<sup>18</sup>

### 155 Data analysis

156 Thematic analysis was conducted according to the steps outlines by Howitt.<sup>19</sup> On completion of transcribing, all  
 157 interviews were input into NVivo® software. Initial coding was as per CFIR constructs followed by  
 158 identification and definition of emerging themes under each construct. Each theme was then characterised as a  
 159 facilitator or a barrier to development and implementation. The analysis was independently conducted by two  
 160 researchers (TJ and one other), with any disagreements resolved through discussion.

161

162 **Ethical considerations**

163 Ethical approval was received from Robert Gordon University (RGU) School of Pharmacy & Life Sciences  
164 Research Ethics Committee (Approval reference S64), Ministry of Public Health (MoPH) Ethics Committee,  
165 Hamad Medical Corporation (HMC) Medical Research Committee (Approval reference MRC0449/2017), and  
166 Qatar University (QU) Institutional Review Board (Approval reference QU-IRB 772-E/17). Written, informed  
167 consent was obtained from all research participants before commencing the interviews.

168 **Results**

169 **Stakeholder recruitment**

170 Data saturation was deemed to have been achieved in each stakeholder group after 37 interviews had been  
171 completed. Stakeholder groups and details of interviewees are presented in Table 2.

<b>Table 2: Characteristics of included stakeholders according to practice setting</b>	
<b>Stakeholder category</b>	<b>Setting: Number of interviewees</b>
<b>Academic leaders</b>	<ul style="list-style-type: none"><li>• Medicine: 2</li><li>• Pharmacy and Pharmacy technician: 5</li><li>• Nursing: 2</li></ul>
<b>Healthcare policy developers</b>	<ul style="list-style-type: none"><li>• Primary care/Community: 1</li><li>• Secondary care: 1</li><li>• Tertiary care: 2</li><li>• Corporate/Ministry: 2</li></ul>
<b>Medical practice leaders</b>	<ul style="list-style-type: none"><li>• Secondary care: 2</li><li>• Tertiary care: 3</li></ul>
<b>Pharmacy practice leaders</b>	<ul style="list-style-type: none"><li>• Primary care/Community: 2</li><li>• Secondary care: 1</li><li>• Tertiary care: 2</li><li>• Corporate/Ministry: 1</li></ul>
<b>Nursing practice leaders</b>	<ul style="list-style-type: none"><li>• Secondary care: 1</li><li>• Tertiary care: 2</li><li>• Corporate/Ministry: 2</li></ul>
<b>Patient safety advocates</b>	<ul style="list-style-type: none"><li>• Primary care/Community: 1</li><li>• Secondary care: 1</li><li>• Tertiary care: 4</li></ul>

172 **Themes**

173 The themes identified, mapped to CFIR domains and constructs, are summarised in Table 3. In general, there  
174 were no marked differences in responses from interviewees across the professional groupings.



**Table 3: A summary of the CFIR domains and constructs relating to views and perspectives on pharmacist prescribing in Qatar**

CFIR domain	CFIR constructs	Themes	Illustrative quotes
Innovation characteristics	Innovation source	Many of the interviewees across all stakeholder groups were aware of the concept of non-medical, and specifically pharmacist, prescribing.	“Worldwide, there are different and many models of prescribing. So there is the North American model which is usually in most cases more of a collaborative framework... In the UK they started a decade or two ago to have independent prescribing models for both nurses and pharmacists... But even many other countries have started to do that.” <i>Healthcare Policy Leader 2</i>
		Several were, however, less aware of non-medical prescribing practice.	“I am not sure actually. Where I come from in Germany or Switzerland that is not the case. In the United States, I think it is the case but I don’t know to what extent.” <i>Medical Practice Leader 1</i>
		Interviewees highlighted that this was not currently within scope of practice in Qatar.	“They will advise the doctor that this is right or you need to modify... But not a direct dealing with prescribing.” <i>Patient Safety Advocate 2</i>
		There was recognition of the new role within anticoagulation which required physicians’ co-signatures.	“I only know at Heart Hospital, they have anticoagulation clinic where the pharmacists are involved... I think they are recommending the doses and the doctors will agree.” <i>Academic Leader 4</i>
	Evidence strength and quality	Most considered the evidence around this initiative of sufficient quantity and strength to support developments in other countries.	“Pharmacist prescribing privileges in the UK... has been established since long time and there is also enough data to show the effectiveness and the efficiency of such initiative.” <i>Academic Leader 3</i>
	Relative advantage	There were particular advantages to the pharmacists themselves by increasing their job satisfaction and confidence.	“It will increase their self-confidence, they will feel that they are able to contribute more to society, they will feel that they are really a valued member of the healthcare team.” <i>Academic Leader 1</i>
		There were benefits for physicians, with reduced time spent on prescribing.	“This will also reduce the pressure that we put on the physicians.” <i>Academic Leader 3</i>
		It could lead to more timely access to care and improved patient satisfaction.	“That would also enhance the patient experience itself in terms of waiting time, quick access to healthcare professionals.” <i>Healthcare Policy Leader 2</i>
		Pharmacist prescribers could be more effective and safer than physicians given their education and training on medication.	“When I look at the data we currently have, there is definitely room for improvement... I think having people who are specifically trained and experienced in that area has got to be better.” <i>Healthcare Policy Leader 5</i>
		This has also the potential for reducing the cost of healthcare.	“When you make the physicians’ time available for more complicated cases, this may be associated with cost reduction.” <i>Academic Leader 3</i>
		It could also impact the roles and responsibilities of pharmacy technicians.	“I know pharmacy technicians will obviously have more responsibilities because the pharmacists will have to spend time with the patients.” <i>Academic Leader 4</i>
		The image of the profession may also improve resulting in increased applications to study pharmacy in Qatar.	“Having privileges for pharmacists to prescribe medications will really help in improving the pharmacy picture in the community... It will help in recruiting more national pharmacists.” <i>Academic Leader 3</i>
		Trialability	Another key theme was the need to start slowly by piloting in defined areas prior to implementing on a wider scale.
	Complexity	The potential complexity of pharmacist prescribing particularly in relation to diagnostic skills was also raised.	“If it is left to the pharmacist to make a clinical diagnosis and write a prescription, that to me, is beyond the scope, I think.” <i>Patient Safety Advocate 5</i>

		Embedding sufficient quality assurance was also highlighted.	“The challenge is just to secure the quality that is needed to make this a reality.” <i>Medical Practice Leader 1</i>	
		There was also a concern over conflict with physicians, particularly if independently prescribing.	“The disadvantage would be the conflict... because if you create some kind of independency among clinical pharmacist, he might work away from the physicians’ direction.” <i>Medical Practice Leader 3</i>	
		Some interviewees highlighted that the current legislative framework could be a barrier to be overcome.	“You have to change the law which is not easy... How you are going to handle this legal framework? How are you going to make it legal for the pharmacists?” <i>Healthcare Policy Leader 3</i>	
		Another concern was the possibility of overburdening pharmacists.	“The other disadvantage is... overburdening the pharmacists with prescribing duties as well as clinical duties on the ward.” <i>Patient Safety Advocate 3</i>	
Outer setting	<b>Needs and resources</b>	Public perceptions of pharmacists, their training, and abilities may hinder implementation.	“Many patients, especially in the Arab region, will tell you “Ah, pharmacist? He just dispense medication. I would trust the physician more”.” <i>Academic Leader 2</i>	
	<b>Cosmopolitanism</b>	The fact that pharmacist prescribing had been successfully implemented in other countries could facilitate implementation in Qatar.	“You have to connect them with other experience or to be affiliated with another organisation whom they have the same program for example prescribing in Canada, USA, UK...” <i>Patient Safety Advocate 1</i>	
Inner setting	<b>Networks and Communications</b>	Interviewees highlighted that health professionals working in hospitals were more aware of pharmacists’ clinical roles.	“Talking about physicians and nurses because they are in a daily contact with the pharmacists, they are aware of the pharmacist’s role especially when we say in the hospitals... But talking about maybe community, I think no.” <i>Academic Leader 3</i>	
	<b>Culture</b>	There were mixed views relating to organisational culture within Qatar in relation to embracing change.	“You will always get people who embrace the change very, very quickly and you always get people who are really kind of slow to adopt the change.” <i>Nursing Practice Leader 1</i>	
	<b>Implementation climate</b>	<u>Tension for change</u>	Interviewees perceived several positive drivers for change such as the lack of physicians.	“With the increased costs of healthcare and shortage of healthcare providers including physicians of course, there is a need to widen the scope of prescribing.” <i>Healthcare Policy Leader 2</i>
		<u>Compatibility</u>	Another driver was the quality of pharmacy education in Qatar.	“I think you have probably got more chances of getting pharmacists prescribing than nurses. There is a very strong academic programme for pharmacists in Qatar...” <i>Nursing Practice Leader 1</i>
	<b>Readiness for implementation</b>	<u>Leadership engagement</u>	There are currently discussions on extending pharmacist roles.	“For my end, I have no objection to it and I am already pushing it ahead now with a fairly senior consultant.” <i>Healthcare Policy Leader 4</i>
Characteristics of individuals	<b>Knowledge and beliefs about the innovation</b>	Many highlighted how the knowledge base of pharmacists could facilitate pharmacist prescribing.	“I think pharmacists certainly from my contacts have a tremendous amount of knowledge. They need to be supported in expanding their scope of practice.” <i>Academic Leader 9</i>	
	<b>Self-efficacy</b>	Many commented on pharmacists’ self-efficacy to prescribe.	“Pharmacists perceptions about their own roles and responsibility, maybe about their own self-confidence, maybe they don’t feel ready.” <i>Academic Leader 1</i>	
		Others felt that pharmacists were competent enough to prescribe.	“I don’t think our pharmacists are less than these countries where these models occurred especially that you always have these tests or requirements to get competence.” <i>Healthcare Policy Leader 2</i>	
	<b>Other personal attributes</b>	Interviewees highlighted need for experience in clinical practice prior to undertaking prescribing.	“I would say that they should definitely have at least five years of experience because I think those also build your confidence and your skills and you can begin to see patterns in patients.” <i>Academic Leader 9</i>	

		However, similar to medicine, others believed new pharmacy graduates should also be allowed to prescribe.	“That is like asking for a freshly graduated physician needing to have additional and continuing training in order to qualify him/her as safe.” <i>Medical Practice Leader 1</i>
<b>Process</b>	<b>Reflecting and evaluating</b>	They should be monitored very carefully to identify and resolve any issues.	“I think that it has to be carefully monitored... to see how they are, how they are doing... and to make sure if you want to improve, how do you improve.” <i>Academic Leader 9</i>
		The need to measure the success and value of pharmacist prescribing was also highlighted.	“We will do it, test it, then we will see the results... What are the pros, the cons, values and [do] we get added value or it is a waste.” <i>Patient Safety Advocate 1</i>
<b>Abbreviations:</b> <b>CFIR:</b> Consolidated Framework for Implementation Research ; <b>UK:</b> United Kingdom			

175 The more dominant themes in terms of the depth of discussion and the number of participants discussing each  
176 were those around the preferred design, relative priority, available resources, and planning. Therefore, these are  
177 described in more details below.

178 **CFIR domain 1: Innovation characteristics**

179 Design quality and packaging

180 (Defined in the framework as the perceived excellence in how the innovation is bundled, presented, and  
181 assembled)

182 On discussion of the preferred model of pharmacist prescribing and its implementation, there was an  
183 overwhelming view that it would be best to be more conservative, particularly in the initial stages, prior to  
184 proceeding to a more autonomous model. This was highlighted by all stakeholder groups.

185 “At the time being, I believe that [collaborative prescribing] will be the foundation for things that we have  
186 then after that we will focus on independent.” *Pharmacy Practice Leader 3*

187 The importance of clearly identifying the need for pharmacist prescribing and targeting therapeutic areas and  
188 patient groups was emphasised.

189 “I think it is also important to see that there is a need for it. Not just do it in all the areas, no.”

190 *Academic Leader 1*

191 However, several held contrary views that restricting pharmacist prescribing to specific conditions or medicines  
192 may prevent a holistic medicines review.

193 “I think it is very hard to limit yourself to one section of the formulary... We don't want to get into a  
194 situation where we see the patients and we will say ‘I can only prescribe this bit’.”

195 *Nursing Practice Leader 1*

196 There was a wide-ranging discussion on the appropriate settings for implementing pharmacist prescribing.  
197 While it appeared that there was more support for implementation in the hospital sector, there was also potential  
198 for later implementation in other settings, including community pharmacy.

199 “At the time being, I believe that the hospitals should be the first people to implement it just to establish the  
200 fundamental things then after that we can expand it to PHCC and the community pharmacies.”

201 *Pharmacy Practice Leader 3*

202 There was overwhelming agreement that pharmacist prescribers should undertake specific education and  
203 training prior to prescribing, irrespective of their prior qualifications.

204 “Train the pharmacists. It is not only training once... It has to be over a long period so that you ensure the  
205 sustainability of the skills and the knowledge they have obtained.” *Academic Leader 2*

206 Supervision was considered to be a key element of the programme to allow assessment of prescribing in practice  
207 and attainment of the required competence.

208 “I think a period of supervised practice would be helpful. So, I think finding a medical colleague who is  
209 really supportive that can kind of support the pharmacist through the process.”

210 *Nursing Practice Leader 1*

211 **CFIR domain 3: Inner setting**

212 Implementation climate: Relative priority

213 (Individuals’ shared perception of the importance of the implementation within the organisation)

214 Developing and implementing pharmacist prescribing was perceived to be a priority in keeping with the aims  
215 and ambitions of Qatar National Vision 2030 and the National Health Strategy.

216 “The triple aims that are set out in the National Health Strategy I think almost require us to think about  
217 pharmacist prescribing more because a major part of it is about safe care.”

218 *Healthcare Policy Leader 6*

219 Others noted that while pharmacist prescribing was important, other initiatives were more important to  
220 implement mainly due to the existing models of physician prescribing.

221 “I cannot say it is priority one because physicians are prescribing, and physicians have been prescribing for  
222 many years.”

*Healthcare Policy Leader 6*

223 Readiness for implementation: Available resources

224 (The level of resources organisational dedicated for implementation and on-going operations including  
225 physical space and time)

226 Positive comments were received on resources which would be required for implementing pharmacist  
227 prescribing, especially in hospital setting.

228 “I can only talk about it from a hospital perspective but I have never worked in such well-resourced  
229 environment from a pharmacy perspective. So I think it may just be about reengineering and looking at  
230 different ways of practice.”

*Nursing Practice Leader 5*

231 Some interviewees held contrary views, expressing views that additional resources would be required to  
232 implement pharmacist prescribing.

233 “Right now, I think if I just look at HMC, there is not enough resources to just deliver care. So, I think, with  
234 this, it will be a resource intense effort.”

*Patient Safety Advocate 5*

235 **CFIR domain 5: Process**

236 Planning

237 (The degree to which a scheme or method of behaviour and tasks for implementing an innovation are  
238 developed in advance, and the quality of those schemes or methods)

239 In relation to planning for the implementation, one theme which emerged very strongly was the need to engage  
240 with other stakeholder groups to eliminate specific barriers such as resistance.

241 “I would then be looking at a stakeholder consultation to say this is what we believe from all the review  
242 work that we have done, what are the issues for the various stakeholders.”

243 *Nursing Practice Leader 4*

244 Aspects of governance were also considered key to successful implementation, by clearly describing the  
245 prescribing framework and limits of prescribing.

246 “I would set up some sort of clear governance framework for it and so it is very clear at which point  
247 decisions are made and who is responsible and accountable for them.”

248 *Nursing Practice Leader 4*

249 Many also discussed the requirement for business case planning, highlighting the weaknesses of the current  
250 system and the likely benefits to be gained from allowing pharmacists in Qatar to prescribe.

251 “You have to submit a good proposal showing the strengths and weaknesses, the SWOT [strengths,  
252 weaknesses, opportunities and threats] analysis and you should show them of course that this would be  
253 good.” *Healthcare Policy Leader 2*

254 Engaging: Key stakeholders

255 (Individuals from within the organisation that are directly impacted by the innovation, e.g., staff responsible  
256 for making referrals to a new program or using a new work process)

257 The need to consult and engage with wide-ranging groups of stakeholders was evident across all interviews.

258 “It is much easier to achieve change if you have everybody engaged and they will be more agreeable to a  
259 change because it is not being a change applied to them, it is applied with them.”

260 *Patient Safety Advocate 3*

261 Given that patients were at the centre of healthcare and the prescribing process, it was essential that their views  
262 were taken into account.

263 “My advice is to involve the patients as early as possible in the process of planning so even if they didn’t  
264 accept it, you will know why.” *Pharmacy Practice Leader 5*

265 Policy makers across many health institutions in Qatar were also considered vital to the implementation process.

266 “I am quite positive that healthcare policy makers need to be on board. You need to get their buy-in to be  
267 able to promote it.” *Academic Leader 1*

268 Support from pharmacy leaders was also considered crucial, with interviewees discussing the need for  
269 appropriate workload and balance.

270 “Say you have the staff already committed to do their own work, you need to give them protected time [to  
271 prescribe] and here you need the leaders to be involved.” *Pharmacy Practice Leader 5*

272 Academics were highlighted as being key to the implementation of pharmacist prescribing particularly in  
273 relation to education and training, and to ensuring appropriate standards of practice.

274 “I think for developing the competency or developing the guidelines maybe we will need the academic  
275 people.” *Pharmacy Practice Leader 3*

276 On discussing engagement of the drug industry, many interviewees highlighted their concerns over their  
277 involvement.

278 “You might want to have a representative as an observer, that is fine. But I don’t think they can actually  
279 have any input because they would be biased.” *Academic Leader 7*

280 Categorisation of themes into facilitators and barriers to pharmacist prescribing implementation are given in  
281 Table 4, illustrating a greater number of facilitators than barriers. Key facilitators were tailoring the model to  
282 Qatar needs and providing additional training to pharmacists prior to allowing them to prescribe while the key  
283 barriers reported include the current legislations in the state the potential initial resistance to this new role by  
284 doctors and the public.

285

**Table 4: Themes of facilitators and barriers to the implementation of pharmacist prescribing in Qatar mapped to CFIR domains and constructs**

<b>CFIR Domain</b>	<b>CFIR construct</b>	<b>Corresponding factors</b>	<b>Classification (Facilitator/Barrier)</b>
<b>Innovation characteristics</b>	Innovation source	Awareness of non-medical prescribing and especially pharmacist prescribing practice globally	Facilitator
		Prescribing not currently within the scope of pharmacy practice in Qatar	Barrier
		Establishing the pharmacist-led anticoagulation clinic	Facilitator
	Evidence strength and quality	Robust and rigorous evidence of effectiveness and safety reported globally	Facilitator
	Relative advantage	Potential to: -Increase pharmacists' job satisfaction and confidence -Reduce doctors' workload -Provide timely and holistic care, increasing patients' experience and satisfaction -Reduce cost of healthcare -Improve image of the profession -Expand role of pharmacy technicians	Facilitator
	Adaptability	Potential to adapt models of pharmacist prescribing developed and implemented in other countries	Facilitator
	Trialability	Potential to pilot on a small scale to determine effectiveness	Facilitator
	Complexity	Lack of pharmacists' diagnostic skills	Barrier
		Need to ensure sufficient quality when prescribing	Facilitator/ Barrier
		Potential for conflict with physicians, most notably if an independently prescribing developed and implemented	Barrier
		Current legislative framework in Qatar	Barrier
		Impact on pharmacists' workload	Barrier
	Design quality and packaging	Implementing collaborative prescribing before proceeding to a more autonomous model	Facilitator
		Need to prescribe in defined areas of clear need	Facilitator
Preference to initially implement in secondary care prior to extending to other settings		Facilitator	
Requirement to provide additional education and supervised training		Facilitator	
<b>Outer setting</b>	Needs and resources of those served by the organisation	Public and healthcare professionals' perceptions of pharmacists' education, training and practice	Barrier
	Cosmopolitan	Ability to collaborate with other countries experienced in pharmacist prescribing implementation	Facilitator
<b>Inner setting</b>	Networks and communication	Existing communication channels in secondary care	Facilitator



	Implementation climate	Tension for change	Shortage in the number of medical prescribers	Facilitator
		Compatibility	Quality of academic programme at the College of Pharmacy	Facilitator
		Relative priority	Goals and ambitions of the National Health Strategy and Qatar National Vision 2030	Facilitator
			Competing priorities	Barrier
	Readiness for implementation	Leadership engagement	Current discussions to extend pharmacists' clinical activities	Facilitator
		Available resources	Availability of resources most notably in secondary care settings	Facilitator
			Need for additional resources to support implementation	Barrier
<b>Characteristics of individuals</b>	Knowledge and beliefs about the innovation	Current knowledge base of practicing pharmacists	Facilitator	
	Self-efficacy	Pharmacists' lack of confidence to undertake a prescribing role	Barrier	
	Other personal attributes	Pharmacy practice in Qatar considered as advanced as in Qatar as those countries which have implemented pharmacist prescribing	Facilitator	
		Requirement for pharmacist prescribers to have experience in clinical area	Facilitator	
<b>Process</b>	Planning	Engagement of other stakeholder groups to identify potential barriers	Facilitator	
		Requirement to develop robust governance mechanisms (role definition, prescribing framework, model, etc.)	Facilitator	
	Engaging: Key stakeholders	Early engagement of a wide range of stakeholders (pharmacy leaders, policy makers, patients, other providers, academics etc.)	Facilitator	
	Reflecting and evaluating	Requirement to plan to monitor prescribing practice regularly	Facilitator	
<b>Abbreviations:</b> CFIR: Consolidated Framework for Implementation Research ; UK: United Kingdom				

287 **Discussion**

288 Interviewees were generally aware of models of pharmacist prescribing in other countries and supported the  
289 development and implementation in Qatar, with many potential benefits highlighted. Key facilitators highlighted  
290 include adopting a more conservative model and providing additional training to pharmacists prior to  
291 commencing prescribing. Main barriers were around the current legislative framework and potential initial  
292 opposition by doctors and the public.

293 There are some similarities between the findings of this interview study and a recently published systematic  
294 review.<sup>7</sup> Focusing specifically on pre-implementation studies, several highlighted that major facilitators  
295 identified pre-implementation included pharmacists' personal qualities (e.g. their clinical experience, education,  
296 and training) and the perceived benefits of pharmacist prescribing (e.g. improved patient access to care and  
297 better utilisation of pharmacists' skills).<sup>20-22</sup> Studies in the systematic review also identified similar barriers in  
298 pre-implementation studies including concerns over pharmacists' poor clinical skills in assessment and  
299 diagnosing, which were key issues in relation to independent models of prescribing practice.<sup>20-25</sup> These concerns  
300 were reiterated in post-implementation studies and may indicate a misunderstanding of the UK independent  
301 prescribing model which does not actually require the diagnosis to be made by the pharmacist independent  
302 prescriber.<sup>3</sup>

303 It is notable that these facilitators and barriers have been identified with groups of non-medical prescribers other  
304 than pharmacists, as highlighted in a published umbrella review.<sup>4</sup> Facilitators were non-prescribers' experience  
305 as health professionals, the application of evidence-based guidelines and treatment protocols, peer support, and  
306 encouragement from medical practitioners and patients. Barriers included the lack of clearly defined roles for  
307 non-medical prescribers, no dedicated time allocated to prescribing activities, other competing tasks, lack of  
308 confidence of some NMPs, and the lack of acceptance of the role by other health professionals and patients.<sup>4</sup>

309 Given that none of the studies included in these reviews had adopted CFIR or a similar framework, it is not  
310 surprising that they did not comprehensively report the facilitators and barriers. Using CFIR in the interviews  
311 identified additional facilitators and barriers, which should be considered as developments advance. These  
312 include: tailoring the specific model of pharmacist prescribing to the needs of Qatar (innovation characteristics);  
313 educating the public and other healthcare providers on pharmacists' education and training, and collaborating  
314 with other countries that have implemented pharmacist prescribing (outer setting); aligning more to the goals  
315 and ambitions of the health setting in Qatar, and considering more the readiness for implementation in Qatar  
316 (inner setting); enhancing pharmacists' confidence to undertake a prescribing role (characteristics of  
317 individuals); and developing robust governance standards and associated processes, involving a diverse group of  
318 stakeholders in implementation, and evaluation of innovation (process).

319 These additional facilitators and barriers highlight the benefit of adopting a theoretical framework in research.  
320 Identifying these factors pre-implementation can allow for a more tailored implementation, which will  
321 overcome as many barriers as possible. This is likely to result in more successful and sustained implementation  
322 with better outcomes for patients, professionals and the organisation.<sup>9-11</sup> There is, therefore, merit in adopting  
323 CFIR in all subsequent stages of development and implementation of pharmacist prescribing in Qatar, as

324 discussed earlier. Such an approach may also be relevant for any other country considering implementation of  
325 pharmacist prescribing.

326 There are many strengths to this study. First, to the best of our knowledge, this is the first and only study on  
327 pharmacist prescribing which has used a theoretical framework of implementation throughout the research  
328 processes hence represents an original contribution to knowledge. Moreover, a qualitative methodology allowed  
329 the generation of in-depth, rich data allowing detailed description and understanding of perspectives.<sup>26</sup> Key  
330 stakeholders in positions of power and influence were recruited which would later enable actual implementation  
331 of pharmacist prescribing. Data saturation was observed across and within all stakeholder groups, hence, the  
332 rigour of the findings and likelihood of implementation increased. The main limitation of this research is that the  
333 data were generated in Qatar hence the findings may lack transferability to other countries in the Middle East  
334 and beyond. However, attention has been paid to describing the research setting, methods, and interviewees to  
335 allow readers to consider likely transferability to their own settings and individuals.

336 Future research needs to focus on determining the most suitable framework and training needs for pharmacist  
337 prescribing in Qatar. A consensus-based approach, such as the Delphi technique, with a similar group of  
338 stakeholders used in this study could be an appropriate approach since it is particularly useful in developing  
339 policies, supporting governance, and stimulating debate around areas where there is uncertainty or incomplete  
340 evidence.<sup>27-30</sup>

341

## 342 **Conclusion**

343 This qualitative study of key stakeholders in Qatar has demonstrated the potential for pharmacist prescribing to  
344 be developed and implemented in Qatar. Using CFIR pre-implementation has identified key facilitators and  
345 barriers which can be considered as part of action planning, most notably defining models of prescribing  
346 suitable for Qatar, within a governance framework of education, training and accreditation.

347

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