Development of a model to deliver primary health care in Qatar

Mohamed Ahmed Syed, Hanan Al Mujalli, Catherine Maria Kiely, Hamda Abdulla A/Qotba

ABSTRACT

Background Healthcare providers around the world are seeking to manage the rising burden of chronic conditions against a backdrop of both growing and ageing populations as well as greater expectations of health services. This paper describes the development of an integrated primary care model ‘the family medicine model (FMM)’ to deliver primary healthcare in Qatar to better address some of the healthcare challenges faced.

Methods A developmental approach was adopted in defining an FMM for Qatar that could potentially address health needs of its population, while acknowledging local context and addressing complexities. A literature review was undertaken followed by field visits and setting up of a working group in order to identify, develop and adapt a model suitable for delivery of primary care in Qatar.

Results Key principles of the proposed model and its component were defined. Components included primary care workforce and practice-based teams, service provision and practice-based services, health information and technology, access to care and information, care management, care coordination, practice management and quality and safety.

Conclusions The proposed model is an innovative approach which utilises and integrates these components to deliver holistic primary care. It is anticipated that its introduction will help redesign and integrate the way primary healthcare is delivered to the population of Qatar to help patients manage their own health and reduce the numbers that need to be admitted to secondary care, improving patients’ independence and well-being as well as dramatically reducing the cost to the overall health system.

BACKGROUND

Globally, health of populations is changing. Healthcare systems are under pressure due to a rise in chronic conditions and ageing populations together with increasing availability and demand for advanced healthcare interventions. There is an increasing number of people with chronic conditions such as diabetes and respiratory, heart and neurological diseases. The fastest-growing category of patients is those with multiple chronic conditions. Healthcare providers around the world are seeking to manage the rising burden of chronic conditions against a backdrop of both growing and ageing populations as well as greater expectations of health services.

Strong primary care is often seen as a solution for the challenges that healthcare systems face. It is defined as ‘generalist care, consisting of general medical, (physio) therapeutical and pharmaceutical care, nursing and supportive care, and non-specialised mental and social care, together with preventive and health educational activities linked to these forms of care’. Primary care is considered to be an effective vehicle to ‘improve healthcare access and outcomes while narrowing equity gap’. The importance of investing in a strong system of primary care for a well-functioning health system, better population health and perhaps even greater health equity is supported by seminal studies. Therefore, strengthening and extending primary healthcare is a recognised approach to achieving these goals.
In countries with historically strong primary care, such as the UK, Denmark and the Netherlands, a primary care doctor is generally the first point of contact for patients and is associated with the benefits of providing continuous, comprehensive, coordinated care. In the Middle East, as in some other developed countries (such as the USA, Japan, Korea etc) however, patients have traditionally self-referred to a hospital consultant or specialist. For example, if a patient has an ear ache, the first port of call is to see an ear, nose and throat consultant. Such access to the healthcare system may seem advantageous to the patient, however, it is particularly inefficient for the overall system. Furthermore, strengthening primary healthcare and the attainment of universal health coverage are both considered to be important health policy initiatives in any health system.

With the failure of vertical, disease-oriented models to provide sustained improvements in health outcomes, the need to develop integrated primary care involving the most appropriate health professionals is becoming apparent. Therefore, countries are fundamentally rethinking the ways in which healthcare can be provided to improve patient outcomes, increase access and yet be sustainable. An outcome of this is that advanced models of delivering primary healthcare are being developed and implemented.

‘Family medicine (FM)’ is defined as an academic and scientific discipline, with its own educational content, research, evidence base and clinical activity, and a clinical specialty orientated to primary care. It is a specialty dealing with the breadth of human need. Family doctors are medical doctors trained at the postgraduate level to provide care for patients of all ages and both genders to address most common conditions in community settings. FM takes on very different roles in different health systems. One of its core dimensions and assets is its local adaptability. While many studies have been published highlighting the importance of FM and primary care models, few have focused on the development and adaptation of FM to meet local context in delivering primary care, in particular, in the Middle Eastern Region. FM takes on very different roles (both with patients and in interfacing with the rest of the system) from health system to health system.

Qatar is a peninsular Arab country with a population of 2.67 million people backed by the world’s third-largest natural—gas and oil reserves, has been investing significantly in its healthcare system. It launched a national health strategy in 2011, with primary healthcare as its basis. Historically, Qatar’s healthcare system was similar to that of other countries in the Middle East and countries such as the USA, Japan, Korea where patients self-referred to a hospital consultant or specialist. Majority of resources were focused on secondary care services. In 2012, Qatar announced a universal healthcare system. Individuals pay an annual fee of QAR 100 (approximately US$20) to access healthcare. This includes primary care healthcare service delivered by the Primary Healthcare Corporation (PHCC) and secondary and tertiary healthcare service delivered by Hamad Medical Corporation. A small number of private clinics and hospitals also operate in the country which can be accessed using private health insurance or out of pocket payment. PHCC is the largest primary care provider in the country publicly with 27 health centres (all accredited by Accreditation Canada International) and distributed across three geographical regions. Each health centre has a predefined catchment area and provide a wide range of services such as dental, radiology, laboratory, pharmacy, physiotherapy, wellness, social services. Health centres are centrally managed by PHCC’s corporate office.

To meet some of the healthcare challenges of the historic healthcare model and direction set out in Qatar’s National Health Strategy, PHCC identified FM as a model to deliver primary healthcare for its registered population. Currently most available research on FM comes from industrialised contexts. This paper describes the development and adaptation of a family medicine model (FMM) to deliver universal integrated publicly funded primary healthcare in Qatar.

METHODS
The design of the study was explorative and descriptive. A developmental approach was adopted in defining a primary care model for Qatar that could potentially address health needs of its population, while acknowledging local context and addressing complexities. It involved the following (1) a literature review (2) visits to countries and (3) set up of a working group in order to identify, develop and adapt a model suitable for delivery of primary care in Qatar.

Literature review
An initial literature review was undertaken to help define the dimensions of the proposed primary care model. The searches was conducted in MEDLINE, Embase, Cochrane Library and CINAHL databases. It was restricted to studies published in English between 2003 and 2016. Data were extracted and synthesised from publications meeting inclusion criteria. ‘Grey’ literature was identified pragmatically from works known to the PHCC staff (from their own experiences of training and working in the UK, USA and Canada), reference lists and from relevant websites. The identified models were reviewed in terms of their suitability. The literature review findings identified 10 dimensions: Governance, economic conditions, workforce, access, continuity of care, coordination of care, comprehensiveness of care, quality of care and efficiency of care. These dimensions were adopted from the findings reported in a systematic review by Kingos et al which examined the breadth of primary care by identifying its core dimensions.

Visit to countries
To gain first hand insight, members of PHCC senior management team travelled to countries New Zealand.
and Cuba where models similar to the FMM had been successfully adopted to deliver primary healthcare. During the visits, they met with government advisers, FM doctors, nurses, public health officials, medical educators and exchanged information and experience.

**Working group**

A participatory action research (PAR) methodology was adopted in the development of proposed model by setting up a working group. PAR is an approach to research that includes the involvement of stakeholders that is being researched in order to understand their world and to ensure that research outcomes are appropriate to identified needs. PAR was based on reflection, data collection, interactions with stakeholders in a cyclical manner. Stakeholders with knowledge and experience in the dimensions identified by the literature review and those who went on the visits to countries were selected purposively into a working group to ensure the inclusion of adequate expertise in the development of a model. A chair of the working group was identified and leads for each dimension were identified based on their knowledge expertise and area of work. The leads had the responsibility to document observations and experiences using reflective practice methods.

The working group met on regular meetings over 4 months to consider findings of the PAR in developing the proposed FMM. At the meetings, the leads presented their observations, experiences and reflections to the working group for discussion at each meeting. The working group used the information to develop, refine and adapt a proposed primary healthcare model to local context. Stakeholders identified the Patient-Centred Model—A Medical Home for All model by ‘TransforMED’, which is a subsidiary of the American Academy of Family Physicians to provide a framework for the identified dimensions of the proposed FMM. These dimensions were used as the proposed FMM’s components. An aim and set of principles of the proposed FMM were also developed. These were used to set the aims and objectives of the proposed FMM components taking into account PHCC requirements and Qatar’s context.

Through a literature review and country visits, PHCC senior management and a working group an FMM was developed and adapted to PHCC requirements and Qatar’s context while using the ‘Patient-Centred Model-A Medical Home for All’ model as a framework. The aim and key principles of the proposed FMM and its components are presented in the following sections. It must be noted that some of the components identified in this study were either partly or fully in place following previous strategic initiatives (eg, a comprehensive health information management system). At the same time it new areas requiring development were identified (eg, care coordination).

**RESULTS**

**Aim and key principles of proposed FMM**

The adapted FMM’s overarching aim was defined as ‘a continuous relationship with a personal family doctor coordinating care for both wellness and health’. Its agreed key principles are listed below.

- Provide access to services in an efficient and timely manner.
- Shift from treatment to prevention.
- Interdisciplinary team and interprofessional collaboration approach to patient care.
- Deliver coordinated care ensuring seamless patient journey through the health system.
- Implement integrated information technology (IT) platforms and electronic health records and increase use of health information systems and technology, improved facilities in delivery of services to provide high quality integrated care in a safe and effective way.

**Key components of proposed FMM**

The study identified eight key components for the proposed model—see figure 1.

**Table 1** presents the adaptation of the proposed FMM and the key aims and objectives of its components against the TransforMED model.

**Primary care workforce and practice-based teams**

**Appropriately skilled and experienced individuals and teams that work collaboratively**

**Competent workforce**

Training of FM doctors will be undertaken in primary care settings. Healthcare workforce will be recruited taking into account gender requirements and have the necessary primary care clinical skills, levels of experience and language skills to support the patients.

Within each health centre there will be a cohort of clinical, administrative support and practice management staff. Members of the primary care team will all be qualified and licensed to work in their relevant fields.

Staff will work to their full competency to ensure timely and effective delivery of service to the patient. Some key staff will be upskilled as needed.

**Patient and public involvement**

This study was a theoretical exercise to develop a high-level overarching FMM. Patients will be involved in the implementation and evaluation stages.
Clinical staff will have allocated and protected time for professional development activities as well as to reflect on their practice, meet as a team, collaborate, discuss certain cases and undertake learning.

Set up of teams
FM doctors will be the primary provider of services within the health centre, and essentially the leader of the interdisciplinary primary care team. Each team in the health centre, as a minimum, will comprise of at least the core members, which are a FM doctor and a nurse (doctor–nurse team). In addition, FM doctors will be supported by an interdisciplinary and interprofessional team (including allied healthcare professionals and other medical specialties that were identified as important in delivering care to the patient) to provide holistic, coordinated continuity of care to their assigned panel of patients. The availability and number of each type of professional within the team and the number of teams will vary depending on size and location of the health centre. Where not available in a health centre, they will be provided regionally as part of interprofessional collaboration.

Interdisciplinary primary care teams will include a balance of gender and have a mix of language skills, primary care clinical skills and levels of experience and integrated into FM service delivery model.

Defined scope of practice
Scope of practice will be developed and defined for each member of the clinical team. Each member of the team will work to their full scope of practice in order to support an interdisciplinary team approach. Where necessary, new roles and their scopes will be defined and introduced (eg, nurse practitioners, care managers).

Service provision and practice-based services
Integration of a wide range of services closer to the patients’ home

Offer a range of services
When patients present for a consultation or through invitations, they will be offered a wide range of services which will enable an improved, standardised coordinated approach to service delivery.

Patients will be offered additional services with an increased emphasis on health promotion and the prevention or mitigation of chronic conditions (eg, screening interventions). Such services will be provided through the interdisciplinary team. Such services will be located closer to the patients home to reduce barriers to access and value patient travel time—majority of services will be based within each health centre, however, others will be based regionally in larger centres for better coordination of care and economies of scale.

Health information and technology
Integrated clinical information and medical record system to facilitate coordinated and seamless delivery of care and services

Access to an integrated clinical information system and electronic medical records
An integrated clinical information system and patient electronic health records will ensure the patient journey is coordinated and seamless with all health records in one place available to all health providers delivering services. IT-based systems will also be able to provide an audit trail where necessary. Accurate and auditable coding for receipt of payment will be introduced.

Automated technologies will be used to deliver comprehensive care to the practice. Patients’ electronic records
### Table 1 Objectives of TransforMED and adapted FMM components

| Component                      | TransforMED model                      | Adapted FMM                                                                 |
|--------------------------------|----------------------------------------|-----------------------------------------------------------------------------|
| **Primary care workforce and** | **Objectives**                          | **Aim**                                                                    |
| practice-based team            | ► Provide leadership                    | To have a motivated, appropriately skilled and experienced team, that works collaboratively with the ultimate goal of improving health outcomes for the patient. |
|                                | ► Shared vision and mission             |                                                                             |
|                                | ► Effective communication               |                                                                             |
|                                | ► Task designated by skill set          |                                                                             |
|                                | ► Nurse practitioner                    |                                                                             |
|                                | ► Patient participation                 |                                                                             |
|                                | ► Family involvement options            |                                                                             |
|                                | **Objectives**                          | ► Appropriately skilled and experienced individuals and teams that work collaboratively |
|                                | ► Patient participation                 | ► Healthcare professional assigned to each other, working within their team. |
|                                | ► Family involvement options            | ► Strong and trusting relationship with the primary care provider and the inter-professional team. |
|                                | **Objectives**                          | ► Strong, trusting relationships between patient/family and inter-professional team |
|                                | ► Prevention screening and services      |                                                                             |
|                                | ► Surgical procedures                   |                                                                             |
|                                | ► Ancillary therapeutic services and    |                                                                             |
|                                |   support services                      |                                                                             |
|                                | ► Ancillary diagnostic services         |                                                                             |
|                                | ► Comprehensive care for both acute    |                                                                             |
|                                |   and chronic conditions                |                                                                             |
|                                | **Objectives**                          | ► Primary care provider will see different types of primary care services in the same shift, on the same day, for example, may see a well-baby, followed by a well-women. |
|                                | ► No ‘Specialty Clinic’ for primary care | ► No ‘Specialty Clinic’ for primary care services, but rather full access to all services daily through an integrated family medicine service which can address all primary care needs |
|                                |   services                              |                                                                             |
|                                | **Objectives**                          | ► Electronic medical records (EMR) with live visibility to all providers across PHCC |
|                                | ► Electronic orders and reporting        | ► Electronic referrals and visible consultation reports through the EMR.      |
|                                | ► Electronic prescribing                |                                                                             |
|                                | ► Evidence-based decision support       |                                                                             |
|                                | ► Population management registry         |                                                                             |
|                                | ► Practice websitePatient portal         |                                                                             |
|                                | **Objectives**                          | ► Electronic health records                                                |
|                                | ► Electronic orders and reporting       |                                                                             |
|                                | ► Electronic prescribing                |                                                                             |
|                                | ► Evidence-based decision support       |                                                                             |
|                                | ► Online patient services               |                                                                             |
|                                | ► Electronic visits                     |                                                                             |
|                                | ► Group visits                          |                                                                             |
| **Health information and**     | **Objectives**                          | **Aim**                                                                    |
| **technology**                 | ► Wellness promotion                    | To provide access to an assigned family medicine doctor and assigned primary care team through an appointment system as well as health advice and information |
|                                | ► Disease prevention                    |                                                                             |
|                                | ► Chronic disease management            |                                                                             |
|                                | ► Patient engagement and education      |                                                                             |
|                                | ► Leverages automated technologies      |                                                                             |
|                                | **Objectives**                          | ► The Patient is assigned to a team of professionals.                      |
|                                | ► Same day appointments                 | ► Majority of care through appointments, with a member of the assigned team of professionals. |
|                                | ► After hours access coverage           | ► Physicians are an assigned a panel of patients and healthcare providers are grouped in teams with additive panels of patients, depending on the no of providers |
|                                | ► Accessible patient and laboratory     | ► Structured, appointment based service                                    |
|   **Access to care and**       |   information                          |                                                                             |
|   **information**              | ► Online patient services               |                                                                             |
|                                | ► Electronic visits                     |                                                                             |
|                                | ► Group visits                          |                                                                             |
|                                | **Objectives**                          | ► Case management for complex cases                                        |
|                                | ► Population management                 | ► Patient schedules appointments for routine and preventive care services. |
|                                | ► Wellness promotion                    | ► Patient empowerment and involvement in their own plans of care.           |
|                                | ► Disease prevention                    |                                                                             |
|                                | ► Chronic disease management            |                                                                             |
|                                | ► Patient engagement and education      |                                                                             |
|                                | ► Leverages automated technologies      |                                                                             |
|                                | **Objectives**                          | ► To provide better organised, more personalised and proactive care.       |
|                                | ► The Patient is assigned to a team of   |                                                                             |
|                                |   professionals.                        |                                                                             |
|                                | ► Majority of care through appointments,|                                                                             |
|                                |   with a member of the assigned team of |                                                                             |
|                                |   professionals.                        |                                                                             |
|                                | ► Physicians are an assigned a panel of  |                                                                             |
|                                |   patients and healthcare providers are  |                                                                             |
|                                |   grouped in teams with additive panels |                                                                             |
|                                |   of patients, depending on the no of    |                                                                             |
|                                |   providers                             |                                                                             |
|                                | ► Structured, appointment based service |                                                                             |
| **Care management**            | **Objectives**                          | **Aim**                                                                    |
|                                | ► Case management for complex cases     | To provide better organised, more personalised and proactive care.         |
|                                | ► Patient schedules appointments for    |                                                                             |
|                                |   routine and preventive care services. |                                                                             |
|                                | ► Patient empowerment and involvement   |                                                                             |
|                                |   in their own plans of care.           |                                                                             |
will also be linked to a patient portal (with ability to view visit notes, reports and diagnostic test results, etc) and an outbound messaging system to increase access to care and information between the patient and the integrated primary care team. The IT system will also be used to collect and analyse data to understand the populations served for the purposes of healthcare planning and implementation.

**Access to care and information**

*Access to an assigned FM doctor and assigned primary care team through an appointment system as well as health advice and information*

**Assigning of a family doctor**

All patients and their families will be assigned a FM doctor and primary healthcare team of their choice at a health centre. Patients’ preference for assigned family doctors such as gender, language etc will be taken into account. The patients’ assigned FM doctor will play a central role in enabling patients to develop a continuous relationship and a level of trust with their healthcare team and provider thus providing continuity of care.

**Appointment system**

Patients will have access to their assigned FM doctor and primary care team through an appointment system. Booking and cancelling appointments will be enabled through integration of technology. Patients will have access to their primary care teams across two shifts during health centre working hours (7:00–23:00 hours).

**Triage system**

For patients who present to a health centre without an appointment, they will be triaged based on clinical need and if they require urgent care, they will be scheduled within the same shift; otherwise an appointment will be made as appropriate.

**Information and advice**

All patient notes and test results will be available to the team to share through an integrated electronic health record. Patients will also be able to access health education information, request advice, repeat medications and review services without attending the health centre where possible.

**Care management**

*Defined as better organised, more personalised and proactive care*

**Planning and provision of holistic care**

As the distribution of health risks continuously changes over time, in order to modify factors that cause and exacerbate illnesses, patients will be managed through risk-stratified care management strategies. They will target resources on patients based on their need of services,
providing proactive and personalised care in order to improve patient outcomes. These will include provision of community health services involving inter-sectoral actions towards health promotion.

Development and administration of care management plans
On an individual patient level, care management will be a holistic patient-centred approach in caring for those with health challenges. Care management will focus on developing and putting in place interdisciplinary care plans for each patient, particularly those with complex chronic conditions. Care plans will be developed by relevant interdisciplinary primary care team members and the patient.

Care coordination
Coordinated, interprofessional collaborative approach to care with other healthcare providers and organisations

Robust referral and discharge process to and from PHCC
Care will be planned and patient treatment pathways will be unified with an aim to reduce duplication. Where a service cannot be provided by the patient’s assigned interdisciplinary primary care team, or within the patients’ health centre, they will support a coordinated, interprofessional collaborative approach to care with other healthcare providers. This can include referral to a regional primary healthcare centre, secondary or tertiary care provider).

A robust referral process, through a coordinated focal point, to another source (eg, regional centre) and a discharge process back to the interdisciplinary primary care team will be put in place to support a seamless patient journey.

Practice management
Systems and process to support activity and organisational capacity and performance

Set up and managing of patient panels
Each FM doctor will have a patient panel which comprises of his/her assigned patient and their families. They will include a mix of patients based on their disease burden to allow them to keep up with their clinical skills. The patient panels will level workload across the interdisciplinary primary care teams and health centres.

Use of performance indicators
Key performance indicators will be identified and monitored to support service delivery and health centre performance.

Regular review of services
Regular service reviews will be undertaken to enable continuous quality improvement, innovation and planning for future development opportunities. Staff will be allocated protected time for reflection, learning and adapting to new ways of working.

Quality and safety
Leadership and guidance to deliver high-quality services and identify and mitigate risk

Mechanisms to support risk identification and mitigation
Robust clinical leadership and guidance will be put in place to provide vision, strategy and leadership to the health centre team and support risk identification and mitigation. Regular clinical audits will be a key part of health centre business activity. All services will have robust clinical guidelines and governance to ensure both patient and provider safety. A risk management system and regular clinical audits will play a key role.

To apply evidence-based practice in PHCC, standardised clinical guidelines will be implemented and usage monitored through the clinical effective and audit framework. Best practice research will be used to continuously inform the ongoing development of practice services and support the maintenance of accreditation standards already achieved.

Mechanisms to support quality improvement
A positive patient experience is key to improving care quality. Therefore patient voice will be utilised to support health centre initiatives and identify potential opportunities for improvement.

Each regional specialist centre will have individuals with specialist knowledge of and skills in quality improvement, who can take learnings from clinical incidents, peer review or audits and transform these into quality improvement activities and programmes for the health centre.

DISCUSSION
FMM is not a new healthcare approach in the Middle East—it was introduced over thirty years ago. FM training programmes were first established in the 1980s (Kuwait, Jordan, Turkey), in the 1990s (Qatar, United Arab Emirates, Oman, Saudi Arabia), in the 2000s (Iran) and more recently in 2010 (Palestine) and 2011 (Tunisia). Nevertheless FM has not yet developed to its full potential in the Middle East. Little has been published about the FMM as model for primary care delivery in the region. This paper is a first which describes development and adaptation of the FMM to deliver primary care in Qatar taking into account local context. It identified key principles and components of a model that could potentially deliver high quality patient-centred and family-centred primary care in Qatar.

A critical prerequisite to deliver FMM identified in the study was competent workforce. Appropriate training and development will need to be provided in order to ensure each team member is able to fulfil their role and to provide services that will be set out in the FMM. With over 80 nationalities residing in Qatar (predominantly speaking Arabic, English, Hindi, Urdu and Filipino), some of whom are trained overseas and employed in primary care, challenges exists with regards to standardising
practice and communication with patients and between staff. In addition to this, there is a need to actively address the shortage of FM doctors, especially Qatari.\textsuperscript{19, 20} For the existing work force, expanding the scope of practice by expanding procedural skills training and tracking continuous professional development and continuous medical education are challenges which need to be addressed.\textsuperscript{20}

It is recognised that in high-quality healthcare systems, patients should have access to their primary care doctors in a timely manner, including on the same day when clinically appropriate.\textsuperscript{21} This is in line with the findings of this study that an effective, efficient and convenient appointment system is a critical component of the FMM. Prebooking of patients into appointment slots will allow for a smoother, more evenly distributed workflow ensuring consultations are not rushed and time is spent in an efficient manner on required aspects of prevention and treatment. However, it must be recognised that there will always be patients who will attend without a prebooked appointment. Considering ‘advanced access scheduling’, defined as an appointment scheduling system that allows patients to seek and receive care from the provider of choice at the time the patient chooses, could potentially prove to beneficial.\textsuperscript{22} Studies of advanced access support benefits to wait time and no-show rate.\textsuperscript{23}

Care management was found be an essential for inclusion in the proposed FMM in order to deliver personalised proactive care in an organised manner. Empirical evidence indicates that care plans can enhance self-management practices, increase adherence to guideline recommendations, improve processes and clinical outcomes and reduce or delay hospitalisation.\textsuperscript{24} A systematic review of personalised care planning interventions demonstrated small improvements in quality of care for persons with diabetes, hypertension and asthma; improvements in self-efficacy and self-care and some improvements in psychological and general health indicators; interventions were most effective when they were integrated into routine care.\textsuperscript{25} However, the effectiveness of care management varies. Three essential components of care planning—defining and integrating patient goals, optimising quality of chronic disease management and providing a central care record are suggested to critical factors and steps.\textsuperscript{26} These should be considered by health centres in implementing care planning to ensure it reaches its potential in improving patient care. Care plans to incorporate shared decision making and attention to patient preferences may assist in shifting the focus back to the patient and their care needs.

The proposed FMM identified health IT (HIT) as an important component in delivery of primary care its integration with wide health services. Given the fragmented nature of healthcare, the large volume of transactions in the system, the need to integrate new scientific evidence into practice and other complex information management activities, the limitations of paper-based information management are intuitively apparent.\textsuperscript{27} Published studies show that HIT has supported in improving quality by increasing adherence to guidelines, enhancing disease surveillance and decreasing medication errors.\textsuperscript{27} A strong majority of the literature also shows positive effects of HIT on the effectiveness of medical outcomes.\textsuperscript{28} Qatar has made huge investments into state of the art health information management system. While use of HIT is advantageous, a number of challenges exist (which can broadly be categorised in the following financial, technical, time, psychological, social, legal, organisational and change process) in enabling effective adoption and use of such systems.\textsuperscript{29} These should be taken into account.

Quality and safety are vital in delivering primary care therefore features as key components in the proposed FMM model. Existing studies suggests safety incidents are relatively common in primary care, but most do not result in serious harm that reaches the patient.\textsuperscript{30} Diagnostic and prescribing incidents are the most likely to result in avoidable harm.\textsuperscript{30} Having standardised methods to identify and quantify these risks is therefore essential.\textsuperscript{30} This is particularly important when developing and rolling out the FMM—it may introduce new risks which will need to be proactively identified. Similarly, improving the quality of medical care is a major issue for all healthcare systems. It has been identified that the concept of quality in general practice has several components and these can be viewed from either an individual or population perspective.\textsuperscript{31} These include access to a range of services, delivery of services in a professionally competent and humane way, equity in provision of services and offer value for money.\textsuperscript{32}

It has been highlighted that to achieve an integrated approach, a comprehensive health policy is required to define the role and function of primary healthcare, ensure professionals have the competence to fulfil this role and regulate the health system. The proposed FMM requires simultaneous health reforms which facilitates the necessary integrated approach. In addition, regulation and collaboration of public-private integration to stimulate collaboration and promotion of health, to address the needs of the populations.\textsuperscript{33} While FMM does not explicitly define ways of public-private partnerships, it facilitates them in order to allow horizontal integration of healthcare.

**CONCLUSION**

The proposed FMM is an innovative approach which uses and integrates these components to deliver holistic primary care. It is anticipated that its introduction will help redesign and integrate the way primary healthcare is delivered to the population of Qatar in helping patients manage their own health and reduce the numbers that need to be admitted to secondary care, improving patients’ independence and well-being as well as dramatically reducing the cost to the overall health system. However, primary healthcare in Qatar has been set up and functioning in a certain way for decades. In order to implement the FMM nationally, primary care will be required to undergo substantial organisational change at
the heart of which is the objective of continuity of care for patients through integration of health and related care services. This whole systems approach is ambitious in its scale. Therefore, this reform will need support not only from the country’s highest level, but also from health sector partners and from the health professionals and patients within PHCC health centres. It is an approach that carries some risks. Robust evaluations of the pilots should be undertaken to inform the national roll out of the model.

Correction notice This article has been corrected since it first published. The provenance and peer review statement has been included.

Contributors MAS drafted the manuscript. HAQ, HAM and CMK contributed to it and approved the final version.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as online supplemental information.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: http://creativecommons.org/licenses/by-nc/4.0/.

ORCID iD
Mohamed Ahmed Syed http://orcid.org/0000-0002-2396-3534

REFERENCES
1 World Health Organisation. World health report 2008: primary care now more than ever; 2008.
2 Starfield B. Toward International primary care reform. CMAJ 2009;180:1091–2.
3 Health Council of the Netherlands. European primary care. The Hague; Health Council, 2004.
4 Orynbassarova D. Family medicine as a model of primary health care services delivery: a pilot study in Almaty, Kazakhstan. Cent Asian J Glob Health 2015;4:209.
5 Kringos DS, Boerma W, van der Zee J, et al. Europe’s strong primary care systems are linked to better population health but also to higher health spending. Health Aff 2013;32:686–94.
6 Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. Milbank Q 2005;83:457–502.
7 De Maeseneer J, Willems S, De Sutter A, et al. Primary health care as a strategy for achieving equitable care: a literature review; who Commission on the social determinants of health, health systems knowledge network, 2007. Available: http://www.who.int/social_determinants/resources/cdsh_media/primary_health_care_2007_en. pdf [Accessed 27 May 2018].
8 Starfield B. Is primary care essential? Lancet 1994;344:1129–33.
9 Kroenke K. The many C’s of primary care. J Gen Intern Med 2004;19:708–9.
10 van Weel C, Kidd MR. Why strengthening primary health care is essential to achieving universal health coverage. Can Med Assoc J 2018;190:E463–6.
11 Arya N, Dahanman B, Gibson C, et al. Developing family practice to respond to global health challenges: the Besrour papers: a series on the state of family medicine in the world. Can Fam Physician 2017;63:602–6.
12 Commission of the Council of Wonca Europe. The European definition of general Practice/Family medicine; 2011.
13 Ponka D, Rouleau K, Arya N, et al. Developing the evidentiary basis for family medicine in the global context: the Besrour papers: a series on the state of family medicine in the world. Canadian Family Physician 2017;61:596–600.
14 Ministry of Development and Planning Qatar. Qatar monthly Statistics—statistics of December, 2018. Available: https://www.mdpq.gos.qa/en/statistics/Statistical%20Releases/General/QMS/MQPS_60_Jan_2019.pdf [Accessed 27 May 2018].
15 Pope C, Mays N, eds Meyer J. Action Research. In: Pope C, Mays N, eds. Qualitative research in health care. 3rd edn. MA: Blackwell Publishing,. 2006: 121–31.
16 Bulman C, Sniadecki F. Reflective practice in nursing practice. 4th edn. Chichester: Blackwell Publishing, 2008.
17 TransformMed. The transformed patient-centered model. 2009. Available: http://transformed.com/transformed.cfm
18 Abyad A, Al-Baho AK, Unluoglu I, et al. Development of family medicine in the middle East. Fam Med 2007;39:736–41.
19 Bener A, Al Mazaar E. Health services management in Qatar. Croat Med J 2010;51:85–8.
20 Verjee M, Abdullah K, Fetters M. Family medicine’s rapid establishment and early leadership role in Qatar’s health care system. Journal of Healthcare Leadership 2013;5:47–52.
21 Kran T, O’Brien P. Challenge of same-day access in primary care. Can Fam Physician 2015;61:399–400.
22 Murray M, Tantau C. Redefining open access to primary care. Manag Care Q 1999;7:45–55.
23 Rose KD, Ross JS, Horwitz LI. Advanced access scheduling outcomes: a systematic review. Arch Intern Med 2011;171:1150–9.
24 Young CE, Boyle FM, Mutch AJ. Are care plans suitable for the management of multiple conditions? J Comorb 2016;6:103–13.
25 Couter A, Entwistle VA, Eccles A, et al. Personalised care planning for adults with chronic or long-term health conditions. Cochrane Database Syst Rev 2015;CD010523.
26 Edwards ST, Dorr DA, Landon BE. Can personalized care planning improve primary care? JAMA 2017;318:25–36.
27 Chaudhry B, Wang J, Wu S, et al. Systematic review: impact of health information technology on quality, efficiency, and costs of medical care. Ann Intern Med 2006;144:742–52.
28 Kruse CS, Beane A. Health information technology continues to show positive effect on medical outcomes: systematic review. J Med Internet Res 2018;20:e41.
29 Boonstra A, Broekhuis M. Barriers to the acceptance of electronic medical records by physicians from systematic review to taxonomy and interventions. BMC Health Serv Res 2010;10:231.
30 Panesar SS, deSilva D, Carson-Stevens A, et al. How safe is primary care? A systematic review. BMJ Qual Saf 2016;25:544–53.
31 Campbell SM, Roland MO, Bueto EA. Defining quality of care. BMJ 2000;321:1611–13.
32 Seddon ME, Marshall MN, Campbell SM, et al. Systematic review of studies of quality of clinical care in general practice in the UK, Australia and New Zealand. Quality and Safety in Health Care 2001;10:152–8.
33 van Weel C, Almasir F, Farahat T, et al. Primary healthcare policy implementation in the eastern Mediterranean region: experiences of six countries. Eur J Gen Pract 2018;24:39–44.