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## **Remodeling of Health Care Services During Covid-19 Pandemic: A Report from Yarmouk Health Care Center, Kuwait**

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### **Abstract**

Several initiatives were undertaken and/or revamped at Yarmouk Primary Health Care Center to help control Covid-19 pandemic. The purpose of this study was to study the effectiveness of reform initiatives that were undertaken to respond and adapt to the COVID-19 pandemic. A descriptive cross-sectional survey was conducted during February 2019 to December 2020. All adult patients (>18 years) who visited the center during the study period were included and all staff working in Yarmouk health center were also included. SPSS version 19 was used for data analysis. Yarmouk PHCC employs eight Family Medicine Specialists, four General Practitioners, 29 Nurses, 15 Administrators and support staff.

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Result shows that there was a significant reduction (75%), in the proportion of patients visiting the PHCC during the pandemic. Moreover, 9511 employees were screened for Covid-19, using the innovative triage system. Appointment links were used 102, 256 times. Link to issue medical reports was used more than 330 times. The chronic medicines refill link was used 868 times. In conclusion, remodeling healthcare delivery system during Covid-19 in Yarmouk PHCC in Kuwait showed the importance of primary health care system as a gate keeper for diagnosis and prevention of diseases especially during disaster such as Covid-19 pandemic. We advocate that failing to appreciate the importance of PHC in this pandemic moment can be an error in favor of the rapid collapse of the health system within the face of the rise in cases of COVID-19 within the country.

**Keywords:** Covid-19 pandemic; Kuwait; Primary Health Care System; Yarmouk Primary Health Care Center; Health Care Delivery System.

## **1. Introduction**

The State of Kuwait is a constitutional nation, with six governorates covering a surface area of 17,188 km. The governorates include Al-Asimah, Hawalli, Farwaniyah, Jahra, Ahmadi, and Mubarak Al-Kabeer [1]. The Kuwait population is around 4,348,306 as of 26<sup>th</sup> September 2021 [2] with Kuwaiti nationals comprising of around 30.4% population. Kuwait currently has an annual population growth rate of 4.0% per year, and it is projected that it will have a population of 5.9 million by 2050 [3]. Kuwait's Human Development Index score is 0.806, which puts the country in the high human development category with a ranking of 64 [4]. GCC countries are heavily dependent on an expatriate health care workforce, which leads to high turnover rates and poses a challenge to the health care delivery system. The health workforce density (2014) is 24.0 physicians and 59.0 nurses and midwives per 10 000 [5]. Life expectancy at birth for the Kuwait population was 78.6 years in 2020. The primary cause of deaths in Kuwait, are related to non-communicable diseases (NCDs) [6]. It was estimated that in 2016, 72% of deaths in Kuwait were attributed to NCDs [7]. The health care delivery model in the Kuwait region has changed over the decades. It has one of the most modern health care infrastructures, distributed among primary health care centers, six general hospitals and a number of national specialized hospitals and clinics [7]. Family practice is a major overarching strategy for service provision at public health facilities. The primary health care centers provide a comprehensive and quality-based package of services. The records and data in primary health care centers are computerized [5]. The strategies of primary health care center (PHCC) in Kuwait includes, expanding PHCC facilities and strengthening co-ordination between primary, secondary and tertiary health care. PHCCs are staffed by health teams comprising of physicians, nurses, pharmacists, laboratory technicians, X-ray services and administrative workers [8]. With the rapid progression of COVID-19 pandemic across the globe different countries have applied various strategies in an attempt to prevent or reduce and/or control the incidence of cases and manage the existing ones. The State of Kuwait followed WHO, European CDC, US CDC, and/or other countries' institutional guidelines; to contain the disease, given the rising number of cases among Kuwaitis returning from more affected areas such as the UK and USA, and migrant workers who bear the highest burden, given their cramped living conditions [9]. Yarmouk district is in the Asimah governorate of Kuwait, with an area of around 2.5 km<sup>2</sup>, and an estimated population of 24,500. Amongst the population, 76% are Kuwaitis, 18.5 % of the population are between 0-14 years and 15.5% of them are between 50-65 years and 63% of the population is females [10]. The Yarmouk

PHCC provides a comprehensive and quality-based package of services in the district Kuwait. Annually, 180,000-220,000 patients visits Yarmouk PHCC each year that is approximately 500-600 patients daily. The Yarmouk PHCC, has been regarded nationally and regionally by the WHO as an exemplary model for primary health care service provision in the MENA zone. The PHCCs at Yarmouk are engaged in an unprecedented challenge to optimize existing procedures, while adapting new protocols that are continuously introduced by the MOH, and maintain a level of excellence in health services, as part of the WHO accredited Yarmouk Health City. Several initiatives were undertaken and/or revamped at Yarmouk PHCC to help control Covid-19 pandemic. This study was conducted to study the effectiveness of reform initiatives that were undertaken to respond and adapt to the crisis, with the objective of maintaining and –where possible- optimizing the fore-mentioned standards, to be able to withstand the prospect of COVID-19 like disasters in the future. Thus, providing evidence-based data for a more robust model of health care delivery system, in comparison to the prevailing one.

### ***1.1. Yarmouk PHCC transformation plan***

A robust plan was agreed upon at the Yarmouk PHCC to confront Covid-19 pandemic. Initially those areas where necessary changes were needed, were identified, to achieve international standards. For this purpose a team was assigned to search for quality control and quality assurance measures, through the mechanism for adopting Canadian accreditation in the center. The same mechanism that placed the center as the best primary health care center in the capital region in 2017. With the strong belief that clinical follow-up skills are not the most important issue, rather accurate scientific information, proven by evidence, and that secures a high level of medical competencies in the current epidemic must be adopted. In an attempt to consolidate basic health issues for the community in the course of daily life, to prevent the spread of the Coronavirus, the local community council was convinced to consider integrating health promotion campaigns as a major part of the annual activities of the Health City Council, and a small field emergency hospital was established in the center to serve critical cases, and maintain high standards related to research, quality improvement projects and work ethics. The community council provided accommodation to the health care worker in the vicinity of the Yarmouk clinic to guarantee their safety and availability during lock down period. The utmost cooperation between the Center and the Council had the greatest impact on the completion of the Yarmouk City, the healthy city, the first of its kind in Kuwait in 2018. In order to maintain the safety of patients, the initial triage services were provided in primary health clinics and respiratory clinics of the center and they were permitted to monitor the suspected cases of COVID-19 and isolate them from the rest of the patients. Besides that, the center is setting up a (© Heart Savers) program - licensed by the American Heart Association for the first time in primary centers in Kuwait - to train community members to aid in cases of cardiovascular and pulmonary failure. In response to patients' requests, the center continues to provide the routine services of the ideal family medicine clinic, chronic diseases clinic, general medicine clinic, follow-up of the elderly at home, vaccinations, normal operation in the X-ray and laboratory department, and provides consultancy on video calls in emergency cases. Which led to significant improvement in patient and employee satisfaction, and objectivity through control of chronic disease indicators (anthropogenic diabetes, cholesterol, blood pressure, body mass). Moreover, an electronic administrative health services were made available in the center, through an internal work team, with regard to appointments, remote consultations, patient and customer follow-up questionnaires, a practice

management system, a daily employee examination program for symptoms of the virus, medical reports and others. The team was responsible to coordinate the movement of the auditors thereby, reducing the possibility of spread of the virus to the staff and the auditors. The Yarmouk Health Center team is also seeking to achieve WHO recognition of the new modified work program model during the COVID epidemic. According to the World Health Organization report, the center has been accredited as one of the best primary health centers in the Middle East and North Africa, mainly by applying the basic elements of family medicine. With the spread of the COVID epidemic in Kuwait, a series of emergency meetings were held with the center's leadership group, which included heads of all departments in addition to consultants, specialists and first registered family medicine physicians. In these meetings, the potential risks of the spread of the virus in Kuwait in general and the region in particular were discussed, and at that time it was decided that the mandatory examination of the auditors and employees alike should be adopted. In order to implement the mandatory examination, two screening offices have been established. The first office (screening the auditors), was placed opposite the main door, and it was the only way to enter the center to ensure examination of all the auditors. The office decided that the screening person should be a doctor to ensure diagnostic accuracy. The second office (employees screening) was located far behind the first office, and it was decided that one of the members of the nursing staff would do the daily thermal scanning, as well as monitor patients suspected of having coronavirus with preventive health records. There were many challenges in the screening phase; one was the absence of a clear and specific mechanism by the ministry to deal with those who were suspected of infection. Another challenge was the absence of an online mechanism for sharing daily records of employees. Moreover, in coordination between the administration and the Preventive Health, it was agreed to establish a clear and unified mechanism of action at the center level i.e. referring suspected and confirmed cases of infection, defining disease severity criteria etc., before the issuance of a detailed and clear mechanism by the ministry. After the Ministry began issuing detailed mechanisms, these changes were adopted in the center's examination mechanisms, but for the promptness of emergency and radical modifications, it became difficult to circulate the mechanism clearly to all employees. In order to resolve this issue, it was decided to prepare a consolidation of the mechanism by establishing The Yarmouk Protocol. It was a unified protocol that is adopted as a single source for updating the mechanism, and it is dated and numbered with a clear serial issue number that is easy to follow. To ensure the clarity of the generalizations, a group was created (COVID-19 Protocols) on WhatsApp, and all the doctors working at the center were included, then 4 versions of the Yarmouk Protocol were developed and were circulated from 3/18/2020. To ensure that the team clearly understands the mechanism, their implementation was calibrated using an electronic questionnaire. The questionnaire was composed of 23 data points, including demographic and symptom information. The triage nurse would notify the doctor at the first office when there is a case of suspicion, and it was called the (Sounding the Alarm) initiative, to prevent suspected Covid suspects from mixing with the rest of the center's staff. The staff screening mechanism was circulated to the nursing staff to avoid paradoxes based on personal judgment. Then, at the end of the day, the observational doctor will follow up on the results. The results were tabulated on Excel with a numerical sum representing the suspected infection, then tables and graphs are prepared, in addition to a written report. To ensure the accuracy of the count, fake cases were assigned from employees, whereby the employee is asked to answer one of the screening questions in the affirmative, only if the person in charge of the screening asks him the exact same question. Daily reports and schedules were issued. Screening for one employee took on average 4 minutes and 43 seconds. In order to

deal with these statistics effectively, a Preventive Screening Committee was established to follow up the implementation of all preventive measures at the center. Medical reports on the epidemiological situation are sent daily to the committee to review and decided on the WhatsApp group. Any complaint regarding non-compliance with the protective clothing (PPEs) was submitted to the committee, to take the necessary measures. The situation of individuals and the center was evaluated in terms of the epidemiological risk and the need to take immediate precautionary measures. Moreover, after the assessment of the epidemiological risk there was a need to develop mechanisms of action. These developments included the following: Establishing a public telephone consulting system, a telephone psychological counseling clinic, an appointment system (for general and specialized clinics, vaccinations, nutrition, health education etc.), a system for monitoring and printing medical reports requests, monitoring requests for re-dispensing of medicines in cooperation with the pharmacy, a system for monitoring requests for analysis (under implementation), an employee registration system, distance based education using Zoom and WhatsApp programs. A mechanism was established to assess diabetes and stress at home remotely. The desired link was sent to the patient, where he could watch the educational video to understand the correct mechanism for taking the required reading. The patient continues to take the readings and then send it via the link. The doctor would follow the required readings in Excel tables so that the mechanism allows him to arrange according to the timeline, with the explanatory box available for the patient to explain any unusual findings. The doctor can also request to repeat the reading without the need for the patient to come to the center, provided that pressure or glucose analysis devices are available for the observing patient.

## **2. Materials and Methods**

A descriptive cross-sectional survey was conducted during February 2019 to December 2020, to compare the health care delivery model, rate of overall service usage and quality, before and during the Covid-19 pandemic, as observed at the Yarmouk PHCC. The study was conducted in two phases. The first phase began from February 2019 to December 2019, i.e. a control period when the center was working under normal circumstances. And the second from February 2020 to December 2020, a crisis period that marks the start of the Covid-19 pandemic in Kuwait. An online questionnaire for patient and staff satisfaction was included in the study. All adult patients (>18 years) who visited the center during the study period were included and all staff working in Yarmouk health center were also included. Data was collected from the primary care information service (PCIS) under Ministry of Health [8] statistical data base for Yarmouk PHCC activities and service utilization pattern. SPSS version 19 was used for data analysis. Proportion was calculated for number of patients visited the center before and during pandemic. Number of times appointment links and medical reports were issued was calculated. The number of times chronic medicines refill link was used was also reported. Chi-square test was used where appropriate. A p-value of less than 0.05 was considered statistically significant.

### 3. Results

Yarmouk PHCC employs eight Family Medicine Specialists, four General Practitioners, 29 Nurses, 15 Administrators and support staff (Table 1).

**Table 1:** Staff at the Yarmouk Primary Health Care Center before and after pandemic.

Staff	February to December 2019	February to December 2020
Doctors	9	11
Nurses	32	26
Dentist	10	10
Pharmacist	7	7
Laboratory Personnel	8	7
Receptionist	22	15
Porters	10	11
Security Guards	3	3
Drivers	2	2

Result shows that there was a significant reduction of 75%, in the proportion of patients who visited the center during the pandemic to the number of patients attending clinics before pandemic i.e. a total of 151,886 patients visited the center in 2019 while only 72,454 patients were seen in 2020 ( $p < 0.001$ ). Though the proportion of patients using tele-consultation and online consultation significantly increased during the pandemic with no change in patient's satisfaction scores (Table 2).

**Table 2:** Patient satisfaction and referrals at Yarmouk Primary Health Care Center before and after pandemic.

Parameter	February to December 2019	February to December 2020
Patient satisfaction (%)	87.3%	93.2%
Referrals to other Specialists (%)	6617	2411

Ten protocols were established during the epidemiological period, in the Yarmouk Protocol. Approximately, 9511 employees were screened and monitored for the possible symptoms of the Covid-19, using the innovative triage system in the Yarmouk Center. The triage succeeded significantly in controlling the spread of the disease in the first 6 months, with no change in patients and staff satisfaction and with no significant complaints or incident reports. Key Performance Indicators (KPI) for chronic disease control (HBA1C, LDL, BMI, BP) showed either same or better results during the pandemic. The mental wellbeing of both staff and patients were detected. Statistics showed an increase in number of psychiatric patients and mental disease drugs utilization.

Home refill delivery medications managed to deliver 15245 prescriptions by the end of May 2020. Appointment system for acute and chronic disease was introduced to all PHC systems in Kuwait during Covid-19 pandemic. Appointment links were used 102, 256 times across the centers various clinics and departments. The link to issue medical reports was used more than 330 times and 70 reports were issued. The chronic medicines refill link was used 868 times. Patients coming for dental consults in 2019 were 7348 as compared to 6040 patients in 2020 (Table 3). In addition, the center developed better work dynamics, despite the global outbreak conditions and the shortage of medical staff.

**Table 3:** Health care delivery services at Yarmouk Primary Health Care Center.

Health Care Delivery Services	February to December 2019	February to December 2020
Patient visits	158094	87419
Tele-Consults	None	15339
Covid clinic visits	None	20626
Dental Consults	7348	6040
Radiology visits	4433	1624
Laboratory visits	29190	11204
Pharmacy Prescriptions	139366	87726

#### 4. Discussion

Yarmouk PHCC took proactive steps to counter and control Covid-19 pandemic. The study demonstrated that with proper planning, involving all stakeholders and using a multiprong approach with monitoring for evaluation and assessment, natural health disaster like Covid-19 pandemic can be effectively tackled. Moreover, health system strengthening in general and primary care in particular, can also assist in fight against the pandemic. Primary Health care is the cornerstone for countering pandemics like Covid-19. It offers preventive, screening and early detection, management and rehabilitation strategies in a cost-effective manner [11, 12]. A study conducted by Peiris and his colleagues emphasized that though there has been varied country responses to the COVID-19 pandemic, there is a need to ensure that no one is left behind and the services are provided with equity which is the foundation of PHC centers. The current study results reveals that one of the reason the patients were satisfied with the services provided by the Yarmouk health centers even during COVID-19 pandemic was due to the fact that equal health care opportunities was provided to all; as declared in the Astana declaration of Universal Health Coverage (UHC) [12]. Primary Care Physician are usually the first contact for patient; therefore, effective communication skills, continuity of care, rapport with patient and families, being in community and offering health information first hand are some of the unique characteristics of primary care physicians, that may assist in pandemics such as Covid-19[13, 14]. Studies have reported positive role of strengthening health system and primary health care, in dealing with health crisis situations like Covid-19 pandemic [15-17]. As evident from the Yarmouk model of care whereby primary health care model was

implemented and consequently the system was able to manage the pandemic effectively. The frontline health care workers (HCWs) are at immense risk of getting infected from COVID-19 virus. Therefore, protecting them is necessary and is also a challenging task. WHO, CDC and other agencies had recommended safety protocol for the HCWs. Though in many countries it was reported that there was a shortage of personal protective equipment for HCWs. Though this was not the case in Yarmouk PHCCs where stringent measures were undertaken to ensure provision of safe and healthy environment for the HCWs and the patients by implementing Covid-19 prevention Standard Operating Procedures [17]. This included wearing of mask, social distancing, hand hygiene and avoiding gathering.

Effective team dynamics and out of the box strategy was encouraged at the PHCCs. Principles of Family Medicine with emphasis on bio-psycho-social-spiritual model of clinical practice was fully utilized. Patients were facing problems with lockdown, social isolation, transport difficulties and income reduction that caused social, psychological and religious issues, since they could not attend religious activities due to Covid-19 pandemic restrictions and family practice approach was utilized to counter them. Family Medicine strong emphasis on disease prevention and health promotion along with patient education can be utilized to control effects of Covid-19 pandemic [18, 19]. Strong leadership skills with proper planning and implementation is essential to combat Covid-19 pandemic like situation [20]. Leadership and management team at Yarmouk PHCC has effectively demonstrated how a proactive approach is required to deal with emerging health crisis situations. A study conducted on role of primary care during COVID-19 signifies the importance of effective leadership and its responsibilities which includes situational analysis, resource mobilization, effective communication, and coordination among all stakeholders [20]. Community participation, engagement and empowerment results in better health related outcomes. Community leaders' support is vital in tackling such health crisis situation. Making community and community leaders part of the group and emphasizing the fact that they are part of the solution, helps them to support health care management activities. A proper triage system with screening and early identification of Covid-19 cases in primary care settings is crucial in managing Covid-19 pandemic [21]. As observed in Yarmouk PHCCs whereby triage system was placed and it acted as a gate-keeper by differentiating COVID-19 patients from other patients, making an early diagnosis, thereby reducing the overflow on other tertiary care hospitals and emergency departments. Ensuring safety of patients, doctors, nurses and staff is very important in infectious disease outbreaks. During pandemics, primary care settings also play a vital role in providing accurate and updated information about the disease. Diverting office/PHCC based services to patient home based services prevents Covid-19 exposure for both health care providers as well as patients. Therefore clinics should offer tele-clinics to reduce the inflow of patients with common ailments besides that, medications can be delivered to the patients' home to avoid overcrowding. In the current study around 15339 patients used tele-consultation services during February to December 2020. Offering tele-consultations and home delivery of medications is also important in this regard as demonstrated in the current study [22]. The results indicates that overall Yarmouk PHC services utilization declined to 50% in May 2020. It may be due to the fact that alternative virtual online, and remote services were provided and telemedicine was introduced, so patients were using more online resources, which made up for the consultation volumes. The study had several potential limitations. It was conducted in the Yarmouk family health care centers, which has been awarded with the best health city so the health care services at these centers are already



well established in providing quality care to the patients. However, this may not be the case with the health care centers of other cities and countries therefore, the external validity of the results of the study may be limited. Moreover, some data was gathered retrospectively for study purposes therefore the quality of the data gathered may have been affected.

## **5. Conclusions**

Remodeling of the healthcare delivery system during Covid-19 outbreak in Yarmouk Primary Family Medicine Health Care Center in Kuwait reflected the importance of primary health care system as a gate keeper for diagnosis and prevention of communicable and non-communicable disease especially during disaster such as the current pandemic. With all the concern of MOH focused on the hospital network, one component of the system has been under looked that is Primary Health Care. In the plan to combat COVID-19 epidemic in Kuwait, there is no explicit and/or clearly mention of investment and/or strengthening of this component of the health system as gate keeper and as first line prevention. We advocate that failing to appreciate the importance of PHC in this pandemic moment can be an error in favor of the rapid collapse of the health system within the face of the rise in cases of COVID-19 within the country. This review article results showed the reasons why we need to believe that enhancing PHC during this pandemic moment can be a potent alternative.

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## **7. Conflict of Interest**

There are no conflicts of interests.

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