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Impact of COVID 19 Pandemic on Maternal Health Services in Primary Health Care Centers in Basrah city / Iraq

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Abstract—Background: COVID 19 pandemic result in great thread to the public health and by the measures taken to limit viral transmission , a lot of maternal healthcare services had been disrupted .Our research aimed to assess the impact of COVID-19 on access to maternal health services in Basrah city .method : This is a descriptive retrospective records based study implemented during the period from 1st of March 2019 to 31st of August 2019 (pre- COVID19) compared to same months of 2020 (intra-COVID 19). All pregnant women who attended to six chosen primary health care centers in Basrah were included in the study. Results: Comparing 2019 maternal health services indicators with those from 2020, there is reduction about 22% in women in first antenatal visits and 33% in antenatal visits more than one less than four ,49% in visits equal and more than four , postnatal visits by 16% and tetanus toxoid doses by 17% . The greatest reduction occurred in March 2020 then these services utilization surged in July 2020 and decreased again in August .Conclusion:Our results demonstrate negative effects of COVID-19 on maternal health access and a deficient health information system in Basrah.

Keywords: COVID 19 pandemic , maternal health services , antenatal , postnatal , tetanus toxoid.

INTRODUCTION: The novel corona virus (SARS-CoV-2) that causes COVID-19 has elicit in Wuhan City China in Dec. 2019 [1]. Then spread rapidly worldwide leading the World Health Organization (WHO) to characterize it as a pandemic on 11 March, 2020 [2] .

Governments in all the globe quickly act to inhibit the transference of the virus so the public health and medical services have been dropped sharply, and medical workforce were shifted toward caring COVID-19 patients .[3]

The first case of COVID-19 was reported in Iraq in Al-Najaf city on February 22. In Basrah , first case was reported on March 9 and the first death in March 10.[4]

In addition to the direct effect of COVID-19 on our health and wellbeing , it indirectly threatened our health by interrupting the approach of essential healthcare services to the population like maternal healthcare services and routine vaccinations services causing increased in maternal and child mortality [5,6]. A ten percent reduction in the coverage of maternal related and new born related healthcare services result in 28,000 maternal death .[7]

The maternal and child health care services consider as a one of the most important components for saving and improving the health of mothers and child in developing and developed countries[8.]

The scale of the COVID-19 outbreak has result in a massive change in the universal and national level of wellbeing. [9] As a result, many countries are responding to this through national or local lockdowns to inhibit the spread of the disease.[10]

Most health institutions showed overwork in responding to the pandemic so this will increase concern that COVID-19 will disrupt health service delivery especially those for maternal and new born , a lot of pregnant women don't follow up their ANC schedule either due to fear from the infection or due to curfew and stay at home policies so the citizens were unable to reach primary health care centers.

A focused antenatal care model was used for routine antenatal care in times of pandemic in order to decrease risk of diseases transmission between pregnant women and medical staff , now in COVID-19 pandemic this model is in use especially for low risk, uncomplicated pregnancies to minimize the risk of cross infection [11,12] . it recommend a four antenatal care visits instead of eight , first between 8 and 12 weeks, then between 24 and 26 weeks, third at 32 weeks and the last one between 36 and 38 weeks .[13]

Pregnant women worldwide are reported to have experienced increased anxiety and behavioral changes as a result of COVID-19 mainly Chinese [14] and Ethiopian [15] women so the utilization of antenatal care services reduced.

In New York, many pregnant women were scared of infected themselves or feared about vertical transmission so they hesitate about visiting hospitals .[16]

Because of the vital role of vaccination of pregnant women in reduction maternal and child mortality WHO confirm on continuing vaccination programs without any further delay especially tetanus toxoid and influenza vaccine. [17]

Because of COVID-19 outbreak , postnatal services reduced greatly in Pakistan and other underdeveloped countries [18.] . Institutional neonatal mortality increased , with increasing in the proportion of cesarean section rate probably due to change in quality of care, reduction in fetal heart rate monitoring during labor [19] ,nevertheless newborn care practice of placing the baby skin to skin with their mother increased , workers' hand hygiene practices during childbirth also increased.[20]

METHODOLOGY: It is a descriptive retrospective records based study to assess the impact of COVID 19 pandemic on maternal health services in primary health care centers in Basrah using review of all pregnant visits documentation, compared (pre-COVID 19) from 1st of March 2019 to 31st of August 2019 to same months (intra-COVID 19) 2020

This study was conducted in Basrah city south of Iraq , six out of 42 primary health care centers were randomly selected from the three health care sectors that are available in the center of Basrah city .A systematic random sample were followed , from the three lists prepared by Basrah general directorate of health (every list contain numbers of primary health care centers related to each sectors) the fourth and fifth primary health care centers were selected from each list .The health centers are Al-Seef , Al-Mushraq ,Al-Jenina ,Shareaa 60 ,Al-Ressala ,Al-Ribat.

The researcher visited each primary health care center three times per week for two to three weeks, collection process was completed in about three months.

information regarding the numbers of pregnant women who visited each center in each month for booking (1st visit during pregnancy), two and three ANC visits , four and five ANC visits ,post natal visits and visits for receiving tetanus toxoid doses in the pre-COVID 19

period(1st of March, 2019 to 31st of August, 2019) and of intra COVID 19 period 2020. same months

The coverage rate was calculated for each visit using the formula:

Coverage rate = (number of actual users of services / target population for this health services)*100

Data were recorded on Microsoft Office Excel, and analyzed by number and percentage. Then changes in access to maternal health services between 2019 and 2020 were test through One-way Anova , mean and standard deviation tests, statistically confirmed when *p*- value "<" 0.05.

RESULTS: Trends of Antenatal Care Coverage

Comparing the six months of COVID-19 pandemic in Basrah city in 2020, with the same period in 2019, concerning maternal health services access indicators, data during the pre-COVID 19 period (from 1st of March till 31st of August in 2019) ,the monthly coverage of booking visit in all the studied health care centers in Basrah city there is clear reduction and fluctuation from 69.41% in March ,71.70% in April 46.27% in May to 76.30% ,80.7% in June , July respectively and 57.56% in August .In the intra-COVID period(from 1st of March till 31st of August in 2020) ,it changed from 45.62% in March to 60.08% in April, 48.51% in May , 76.74% in June ,47.56% in July and 53.08% in August . (Figure 1) (Table 3.2).

During the pre-pandemic period , the coverage of visits more than one less than four was 86.42% in March , 87.95% in April ,64.05% in May, 80.54% ,85.52% in June ,July respectively to 80.04% in August but during the pandemic it decreased from 58.17% in March to 48.70%, 41.95% , 75.94% ,65.18% , 54.99% in April , May ,June ,July ,and August respectively . (Table 3.2) (Figure 1)

During the pre-pandemic period , the coverage of ANC visits equal or more than four fluctuated from 54.49% in March ,70.17% in April 43.02% in May to 57.80% , 62.16 % in June ,July respectively and 46.90% in August ,during Pandemic it changed from 41.83% in March to 25.55% ,22.66% in April and May respectively to 40.56% in June then 25.05% in July and 25.90% in August . (Table 3.2)

The half annual coverage of booking visit decreased from 66.98% in the pre-COVID 19 period to 55.37% during the intra-COVID 19 period also The half annual coverage of ANC visit more than one less than four decreased from 40.37% in the pre-COVID period to 28.72% during the intra-COVID period while half annual coverage of ANC visit equal or more than four decreased from 27.88% in the pre-COVID period to 15.18% during the intra-COVID period. (Table 3.3)

Trends of Postnatal coverage

During the pre-COVID period in 2019, the monthly coverage of PNC visits in all the studied health care centers in Basrah city fluctuated from 37.29% in March to 52.20% in April to 33.65% in May to 53.18% , 51.93%, 45.93% in June, July ,august ,But within the intra-COVID 19 it varied from 28.29% in March to 38.92% in April then 35.98% in May to reach 64.41% , 36.31% , 39.07% in June ,July and august respectively

.(Figure 1)(Table 3.2).

The half annual coverage of postnatal visit decreased from 45.68% in the pre-COVID period to 40.56% during the intra-COVID period. (Table 3.3)

Trends of Tetanus Toxoid coverage

In all studied PHC centers the monthly coverage was 63.48% in March 2019, 68.48% in April , 49.33%, 68.40%, 78.76%, 63.18 % in May, June, July, August 2019. But in intra-COVID period it changed from 40.04% in March 2020 to 51.90% in April, 52.09% in May 75.15%, 60.09%, 60.09% in June, July, August. (Table 3.2). While the half annual coverage of them changed from 64.41% in the pre-COVID period to 56.49% during the intra-COVID period (17.11% reduction). (Table 3.3)

Table(3.1) the total number of women who visit Maternal Health Services units in the pre-COVID 19 and intra-COVID 19 period in primary health care centers in Basrah 2019-2020

Year	2019								2020							
Month	March	April	May	June	July	August	Total	Mean+-Sd.	March	April	May	June	July	August	Total	Mean+-Sd.
Booking visit	363	375	242	396	418	297	2091	349 +-66.323	229	301	244	386	224	250	1634	272+-62.06
Visit>1<4	452	460	335	418	443	413	2521	420+-45.68	292	244	211	382	307	259	1695	283+-59.56
Visit <=4	285	367	225	300	322	242	1741	290+-52.17	210	128	114	204	118	122	896	149+-44.95
PNC	195	273	176	276	269	237	1426	238+-43.18	142	195	181	324	171	184	1197	200+-63.6
T.T	332	332	258	355	408	326	2011	335+-48.49	201	260	262	378	283	283	1667	278+-57.55

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Year	2019				2020						P		
Month	March	April	May	June	July	August	March	April	May	June	July	August	
Booking	69.41%	71.70%	46.27%	76.30%	80.70%	57.56%	45.62%	60.08%	48.51%	76.74%	47.56%	53.08%	
visits													0.5116
visits	86.42%	87.95%	64.05%	80.54%	85.52%	80.04%	58.17%	48.70%	41.95%	75.94%	65.18%	54.99%	
>1<4													0.3795
visits>=4	54.49%	70.17%	43.02%	57.80%	62.16%	46.90%	41.83%	25.55%	22.66%	40.56%	25.05%	25.90%	0.8576
PNC	37.29%	52.20%	33.65%	53.18%	51.93%	45.93%	28.29%	38.92%	35.98%	64.41%	36.31%	39.07%	0.231
T.T	63.48%	63.48%	49.33%	68.40%	78.76%	63.18%	40.04%	51.90%	52.09%	75.15%	60.09%	60.09%	0.4667

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Table (3.2) monthly trends of coverage of Maternal Health Services in the pre and intra-COVID 19 period in primary health care centers in Basrah 2019-2020

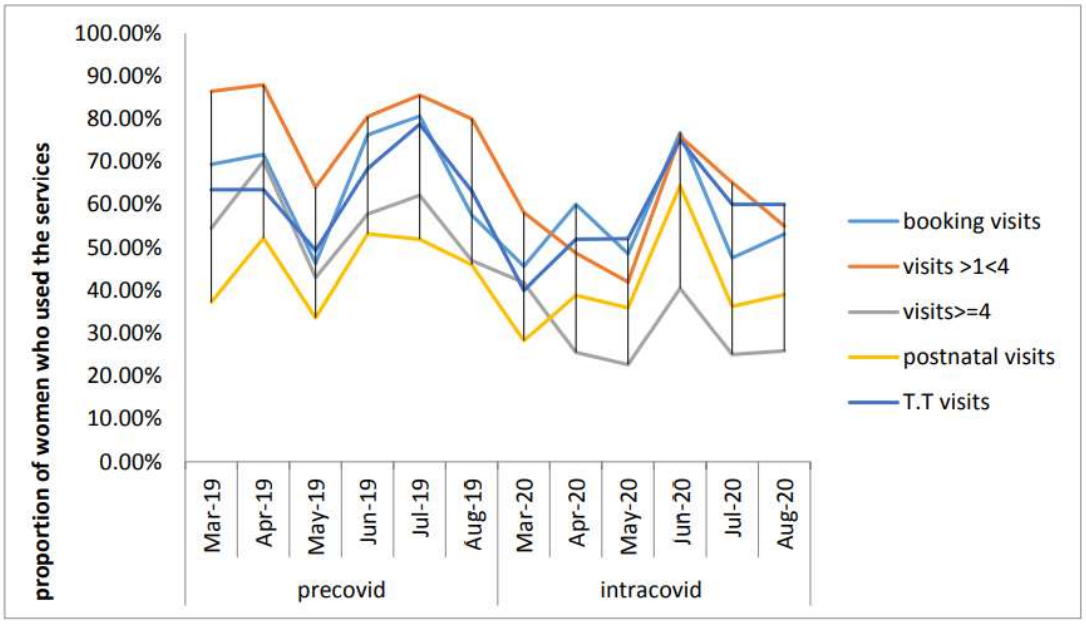

Figure (1) monthly trends of Maternal Health Services in the pre and intra-COVID 19 period in primary health care centers in Basrah 2019- 2020

Table (3 .3) Maternal Health services during pre and intra-COVID 19 period in primary health care centers in Basrah city 2019-2020.

Indicators	2019			2020			change	P - value
	March-- August			March--August				
	NO.	Coverage Rate	Mean+/_SD	NO.	Coverage Rate	Mean+/_SD		
Booking visits	2091	66.98%	349+/_66.323	1634	55.37%	272+/_62.06	21.86%	
Visits >1<4	2521	40.37%	420+/_45.68	1695	28.72%	283+/_59.56	32.76%	
Visits>=4	1741	27.88%	290+/_52.17	896	15.18%	149+/_44.95	48.54%	0.0022
Postnatal	1426	45.68%	238+/_43.18	1197	40.56%	200+/_63.6	16.06%	
T.T	2011	64.41%	335+/_48.94	1667	56.49%	278+/_57.55	17.11%	

DISCUSSION:

Health care services assessment on a pandemic, is an effort to attain goal of health towards all population. This study showed that the utilization of maternal health care services varies with time due to a lot of factors ,like that in the pre-COVID 19 period (from 1st of March, 2019 till 31st of August, 2019) the number of mothers who visited all PHC centers decreased in May , this may be due to the fact that mothers are busy with the final exams of their children in school, which usually occur in May so they postpone their visits to the health care center to June and July so the coverage reach its peak in July.

During the pandemic, Government's COVID-19 pandemic preventive measures might have reduced the case number in Iraq, but they have reduced maternal, children and adolescent's health services access in Basrah. These facts are recognized globally. [21] Media through television and radio, has attained most population, concerning COVID-19 prevention, but reduced users and MCH preventive attitudes and behavior, within the public health system, in primary and secondary health care services [21], so in our study From 1st of March till 31st of August 2020 these service utilization show a massive changes from month to month ,unlike the changes in 2019 which were firm .The number of maternal health services users with its coverage decreased widely in March because of the lockdown which was announced in 15th of March ,so the mothers were unable to the reach the primary health care center ,the curfew continue in March, April and May so the utilization remain low till June when the curfew become partial and mainly at night so mothers visited the primary health care centers again and the health services utilization reach it peak then also decreased because the curfew become complete again. Our findings showed that ANC coverage for booking visit decreased by about 22% in the intra-COVID 19 period compared to pre-COVID 19 period , however even small reduction in these services utilization result in increasing in pregnancy complication and maternal and infant mortality . A similar study in South West Ethiopia revealed a significant drop in the proportion of booking ANC visits during the COVID-19 pandemic [19], this is due to movement restrictions that hinder them from reaching health facility or in seeking health care . In spite of that ,the proportion of women with four visits were not change during the COVID-19 pandemic , This might be due to the fact that the woman who received more antenatal care will have a positive healthcare-seeking behavior even with presence of the pandemic [19] however this don't agree with our study which show 49% reduction in number of women who visit four and more. Postnatal care and institutional birth also showed massive reduction so the proportion of women with a pregnancy complication increased.[19]

This study findings agree with a study done in US, it showed reductions ANC coverage from 51.9 – 39.3% because of the pandemic, which result in 56,700 additional maternal deaths. This may be due to the conversation of maternity wards to COVID-19 units .[7]

A study In Kenya to estimate the monthly utilization of MCH services from March to June in 2019 and 2020, reported that no significant changes for antenatal care attendance, births, family planning .[22]

A study in Northeast Ethiopia reported that only 29.3% of pregnant women fully used the antenatal care services during the COVID-19 pandemic [23] This finding was lower than studies done in India 45% [24] 81.5% in Nigeria [25] and 52 % in Kenya [26] and Nepal 87% [27].

Bnei Brak, a city in Israel found about 87% reduction in ANC service utilization. Maternal Fear of COVID-19 infection to themselves or Its vertical transmission to their babies was the main reason .[28]

Lack of transportation and inability to access to the health care facilities is one of the causes of decreased services utilization in Italy [29] and Northeast Ethiopia.[16]

Our study also showed a reduction in postnatal care services utilization by about 16% compared to the pre-COVID-19 period ,this agree with a study in Nepal ,which reported that during lockdown women found difficulties in reaching the hospital so they died on the way before receiving proper care or they don't visit health facility unless they develop complications. This cause a reduction in institutional delivery and PNC.[30] A study done in eight sub-Saharan African countries (Cameroon, Democratic Republic of Congo, Liberia, Malawi, Mali, Nigeria, Sierra Leone and Somalia) to detect the effect of

COVID-19 pandemic on the utilization of maternal and child health service ,it revealed that in six of these countries , the monthly number of women attending health facilities for booking visit significantly reduced while the number of women attending their fourth antenatal care visit were reduced in five countries . Nigeria reported the Largest and continuous reduction, between 17% and 18% in April, May and July in first antenatal care visit but in June, positive changes occur in number of booking visits. A similar result also seen in Mali.[31] The study also found that the number of postnatal care visits in all the eight countries reduced during the pandemic.[31]

Similar effect was seen in other epidemics, for example the Ebola outbreak in West Africa resulted in increase in maternal mortality by 75%, a study done in Sierra Leone to assess the impact of the Ebola epidemic on maternal and neonatal health in which showed a decline in ANC services of 22% and 8% in institutional delivery and 13% for postnatal care and family planning by 6% these reduction led to more maternal and neonatal death and increased still birth.[32]

As conclusion Comparing the six months of COVID-19 pandemic in Basrah city in 2020, with the same period in 2019, concerning maternal health services access indicators, our data results demonstrate negative collateral effects of COVID-19 on maternal health access. there is reduction in first antenatal visit of year 2020 about 22% than the year of 2019 and 33% in ANC visits less than four more than one , 49% in visits equal or more than four ,the number of postnatal visits by 16% and the number of tetanus toxoid doses by 17% , and all was statistically significant (p value 0.0022) Table (3.4). We recommend to implement appropriate educational programs and better resources for good maternal health.

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