

Process and Practices improvement of Antenatal Care Clinic at a Maternity Care Hospital in Sri Lanka during COVID-19 Pandemic

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DOI: 10.29322/IJSRP.12.05.2022.p12564

<http://dx.doi.org/10.29322/IJSRP.12.05.2022.p12564>

Paper Received Date: 5th May 2022

Paper Acceptance Date: 20th May 2022

Paper Publication Date: 26th May 2022

ABSTRACT

Introduction: Among healthcare settings, antenatal clinics play a pre-dominant role, as it provides essential health care during pregnancy. This research project was an interventional study implemented in De Soysa Maternity Hospital (DMH) with the aim of improving process and practices of Antenatal Care (ANC) clinic during the COVID-19 pandemic.

Methods: The research adopted mixed methods. The antenatal clinic procedure was mapped and gaps were assessed. A pregnant women's satisfaction survey, desk reviews, key informant interviews (KIIs) and a checklist were used. Proportions, percentages and means were calculated for quantitative data and the z test for percentages was applied as appropriate. The p-value <0.05 was considered as significant. Narrative analysis was done for qualitative data.

Results: The existing clinic procedure was complicated and time consuming. The mean waiting time was recorded as 144 minutes per visit in the pre-intervention phase. Based on the process map it was identified that pregnant women were not properly directed within the ANC clinic, scanning unit was located away from the clinic, sample labeling was done by nurses manually and waiting numbers were called by the attendants with an additional effort made to organize the pregnant women. Pregnant women's satisfaction on selected attributes of measures taken to COVID-19 risk mitigation, waiting time and antenatal education provided were 61.5%, 37.1% and 47.5% respectively. Pregnant women are highly satisfied about the facility available and the care provided by the health staff. Post intervention survey of pregnant women and KIIs showed that satisfaction of pregnant women increased significantly at the level of p <0.00. The mean waiting time reduction was significant at the level of p <0.00 and recorded mean time was 100 min per visit.

Conclusion: Process modifications, introduction of COVID-19 risk mitigation protocol and modified antenatal education

procedures were best interventions which successfully solved the gaps identified in existing process and practices. Study recommends introducing a computerized system to reduce the manual workload carried out by the staff and health staff should be provided training opportunities to strengthen the healthcare provided. **Key words:** Antenatal Care Clinic, COVID-19 pandemic, Antenatal education, waiting time, Interventions

I. INTRODUCTION

The antenatal care (ANC) is defined as the care provided by skilled health-care professionals to pregnant women to ensure the best health conditions for both mother and the baby during pregnancy. Women are advised to start ANC at her gestational age less than 12 weeks. During ANC, initial history taking and physical examination followed by periodic screening and diagnostic testing, serial examinations, carefully observing trends of various objective measurements and mother's emotional adjustment to pregnancy are carried out in antenatal clinics (WHO, 2017). Pregnancy is a crucial time for healthy behavior and parenting skill improvement. Good ANC contributes to good health throughout the life cycle for both women and her baby.

Objective of antenatal clinics are;

- Maintenance of health of mother during pregnancy
- Promote physical, mental and social well-being of mother and child
- Ensure delivery of full-term healthy baby
- Decrease maternal and infant mortality and morbidity
- Screening for conditions and diseases such as anemia, sexually transmitted infections, human immunodeficiency virus infections, mental health problems
- Early detection of high-risk cases and minimizes risks by taking appropriate management
- Teach the mother about childcare, nutrition, sanitation, and hygiene
- Prevent development of complications through health

education, adequate nutrition, exercise and vitamin intakes (Lincetto et al., 2006).

In the history of Sri Lanka, the health of its people has been a major concern of its government including maternal care. Accordingly Sri Lanka has achieved remarkable success in maternal health care compared to other nations with similar economic status. The lowest Maternal Mortality Rate (MMR) was recorded in Sri Lanka among the South Asian Countries and it was 39 per 100,000 live births in 2019 (FHB, 2019). It was noted that 95.5% of pregnant women in Sri Lanka receive

prenatal care and 100% of births are attended by skilled health workers (DCS, 2014).

Once the nation achieves a desired level of health care indicators in maternal care, the fine tuning with quality, patient empowerment, patient participation, patient centeredness and customer friendly health care delivery becomes the next priorities. These concepts are highly promoted in recent years in developed countries, as approaches to improve the healthcare quality (Castro, 2016). Long waiting time, limited attention paid on patients' feedback have been major drawbacks in many Sri Lankan governmental healthcare settings. Furthermore, the recent COVID-19 pandemic disrupted the quality of the ANC as well (Beach, 2006). Recent studies have revealed that COVID-19 pandemic has aggravated perinatal anxiety and depressive symptoms among pregnant women which leads to increase in the caesarean section rate (Priyadarshanie, 2017). Provision of special support to pregnant women during COVID-19 pandemic has challenged the existing procedures in health care settings. Therefore, alternative protocols are invited to carry out the routine healthcare services in a strategic way (Pitale, 2020).

De Soysa Maternity Hospital (DMH) is an earliest landmark in maternity care in Sri Lanka and it was established in 1879 as the 1st maternity hospital in Sri Lanka (Haththotuwa, 2012). During the recent past, time base implementation has occurred gradually. It is an ideal setting to be developed as a state of art maternity care center. Analysis of existing performance of ANC process and practices in DMH was fundamental for the improvement of service delivery to convert it into supra role model in ANCs amidst the pandemic.

I. METHODS

The project is an interventional study carried out from February 2021 to August 2021. The study setting was DMH and conducted in three phases including, pre-intervention (phase I), intervention (phase II) and post-intervention (phase III).

The tools used for the study included the following;

(1) A pregnant women's survey

Interviewer administered questionnaire was used for the pregnant women satisfaction survey regarding antenatal care clinics and the process and practices of its provision. The questionnaire was initially prepared in English, after reviewing relevant literature on Likert scale rating. Finalized questionnaire was then translated into Sinhala and Tamil and re-translated into English to ensure the consistency. The questionnaire was pre tested and validated. The questionnaire consisted of the following attributes with a five-point Likert scale rating.

- Provision of antenatal education during clinic sessions
- Availability of basic facilities
- Care provided by the health staff
- Waiting time

- Measures taken for COVID-19 risk mitigation

Considering a 5% non-response rate, 404 pregnant women were recruited for the survey. Systematic random sampling technique was used to identify the sample. Random sampling was based on the antenatal clinic register in a 3 days sampling interval and eligible 50-60 pregnant women were interviewed per day until the sample size was fulfilled. Eligible pregnant women were interviewed until the sample size was fulfilled. The interviews were done adhering to the COVID-19 guidelines.

(2) Key Informant Interviews (KIIs) were held with;

- Medical officer, ANC
- Senior registrar, ANC
- Sister of ANC
- Few nursing officers, ANC

(3) The desk review of secondary data to obtain pregnant women information and basic statistics. Following documents were assessed.

- Antenatal clinic register
- Annual health bulletin of DMH

(4) The checklist was developed and used to obtain the entry and exit times of the clinic visits

Exclusion criteria;

1. Pregnant mothers in 3rd trimester; as they would not be available for post intervention assessment.
2. Mothers for their first clinic visit; as they were unfamiliar with the clinic setting.

In phase I, the process of antenatal care clinic was studied extensively and mapped. Detailed information was gathered regarding the current process and practices by KIIs and gaps were identified in the existing process and practices. Pregnant women's satisfaction was measured using the questionnaire. Clinic entry time and exit time were noted using the checklist. Suitable interventions were developed and implemented during phase II. It included process modification (rearrangement of patient flow, introduction of colour code system for sample labeling, introduction of digital number calling system and re-organizing of scanning facility in the clinic), introduction of clinic schedule with an appointment basis system and providing antenatal education through distant antenatal health programmes such as provision of leaflets and study materials and telecasting learning videos during clinic sessions.

Same tools were used to gather the data in phase III.

Data gathered from the checklist, questionnaires and desk review of records were analyzed from IBM SPSS (2021) software and a narrative analysis was done for KIIs.

To calculate the level of pregnant women satisfaction on each attribute, very dissatisfied and dissatisfied were amalgamated as dissatisfied and satisfied and very satisfied were considered as satisfied. Individuals with neutral rating responses were excluded.

Z test for proportions was used to measure effectiveness of the applied interventions. P value <0.05 was considered as the level of significance.

Ethical clearance was obtained for the study and the administrative clearance was taken from the relevant authorities. Written consents were obtained from the participants.

II. RESULTS

Socio-Demographic factors

Demographic characters of the pregnant women selected for the study are as follows,

Table 1: Demographic characteristics of the pregnant women selected for the survey

	Variable	Feature	Frequency (n=404)	Percentage %
1	Age years	>20	7	1.7
		21-30	190	47
		31-40	158	39
		41-50	49	12.3
2	Parity	1 st	124	30.7
		2 nd	183	45.3
		3 rd	62	15.3
		4 th <	35	8.7
3	Education level	Not formal	8	2
		Primary	21	5.2
		O/L	166	41.1
		A/L	183	45.3
		Higher	26	6.4
4	Employment status	Unemployed	282	69.8
		Employed	122	30.2
5	Monthly income LKR	> 30,000.00	162	40.1
		30,001.00-50,000.00	215	53.2
		50,001.00-70,000.00	27	6.7
		>70,001.00	0	0

Based on the process map (Figure 1) and KIIs following gaps were identified in the indicated areas in the current process map.

A: Pregnant women were not properly directed within the ANC clinic.

Sample labeling and documentation were done by nurses manually

B: Scanning unit located away from the clinic

C: Waiting numbers were called by the attendants with an additional effort to organize the pregnant women in clinic

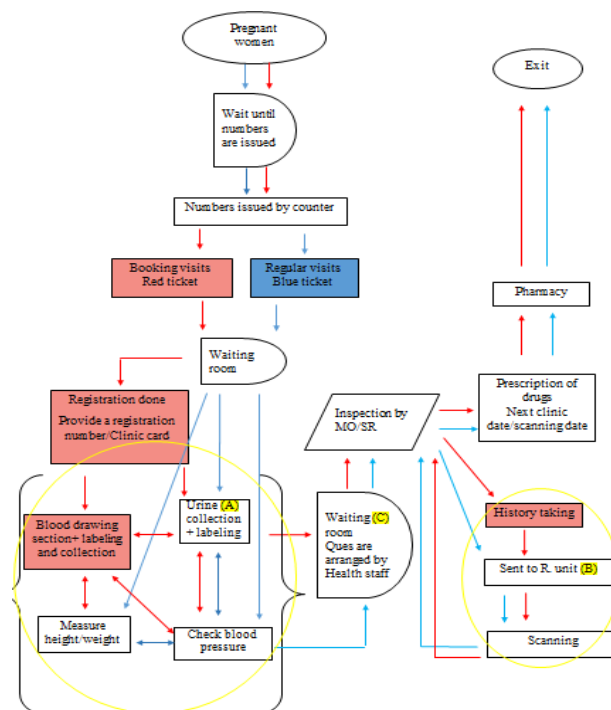


Figure 1: Process map of antenatal care clinic at De Soysa Maternity hospital at the pre-intervention

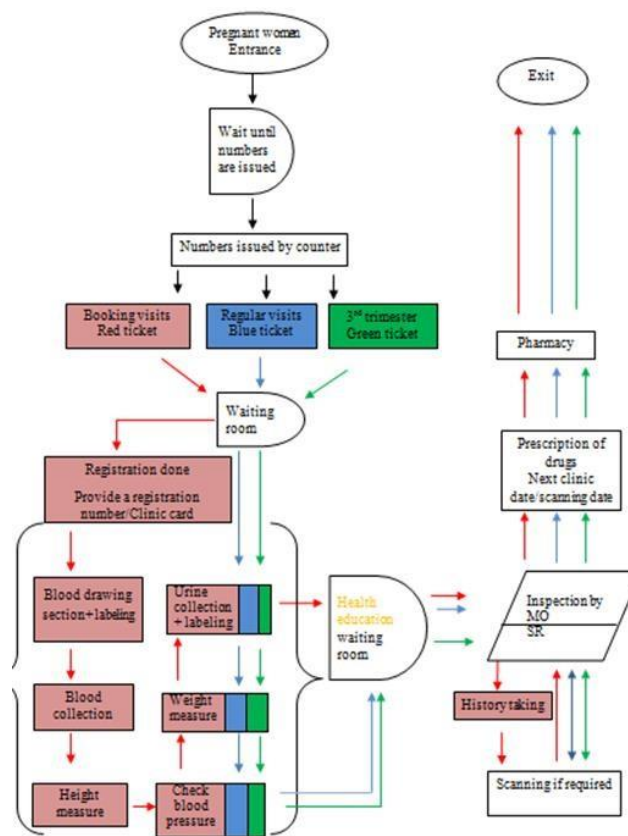


Figure 2: Modified process map of antenatal care clinic at De

Soysa Maternity hospital at the post-intervention

Table 2: Pregnant women’s satisfaction on selected attributes of ANC

	Attribute	Phase	Satisfied (n=404)	Significance (z-test, p)*
1	Antenatal education	Pre	192 (47.52%)	Z=-3.172 P=0.001
		Post	237 (58.66%)	
2	Facility available	Pre	305 (76.49%)	Z=-1.261 P=0.207
		Post	320 (79.2%)	
3	Care provided by the health staff	Pre	337 (83.42%)	Z=-0.875 P=0.378
		Post	346 (85.64%)	
4	Waiting time	Pre	150 (37.12%)	Z=-14.650 P=0.00001
		Post	352 (87.12%)	
5	Measures taken for COVID-19 risk management	Pre	250 (61.88%)	Z=-7.769 P=0.00001
		Post	347 (85.89%)	

Pregnant women’s satisfaction on selected attributes was given in Table 2. The lowest satisfaction was identified regarding antenatal education given (47.52%), waiting time (37.12%) and the measures taken for COVID-19 risk mitigation (61.88%). All lowest level attributes were significantly improved after the intervention at p<0.0001 significance level except facility available and care provided by the health staff.

Figure 2 was developed based on the average results obtained.

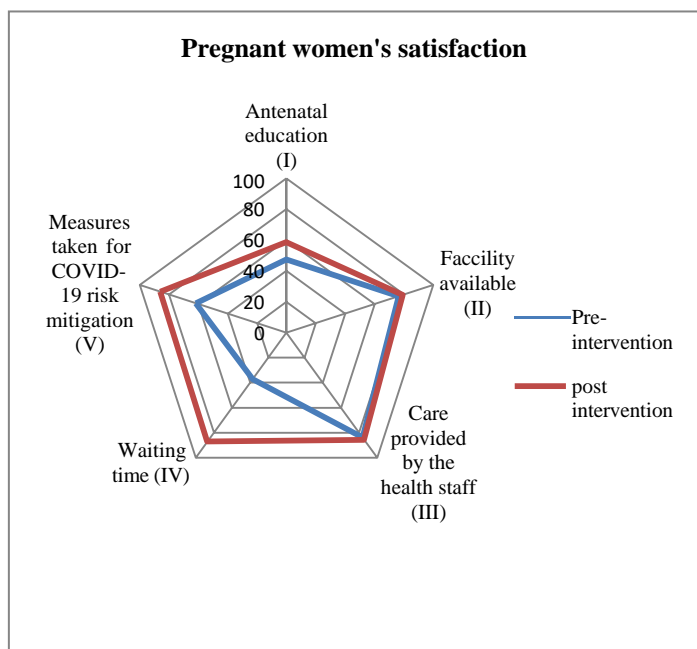


Figure 3: Radar diagram on pregnant women satisfaction at pre and post intervention phases on selected attributes of ANC

Table 3: Waiting time per clinic visit

Mean time per visit Phase I	Mean time per pregnant mother Phase II	Significance (z-test, p)* P value
144 min	100 min	Z=3.3788 P=0.00072

Waiting time at phase I was recorded as 144 minutes and at phase III it was recorded as 100 minutes. The waiting time reduction has been significant at the level of p< 0.001.

III. DISCUSSION

Process Mapping (PM) is an important tool in identifying complex processes and it clearly indicates the existing gaps. Development of PM is involved with multiple phases including planning and process identification, data and information gathering, map generation, analysis and taking forward for process improvement. PMs were reported from a wide range of healthcare settings (Antonacci, 2018). The process map of ANC at DMH revealed that the current clinic process was very complicated and time consuming. Major areas were identified where the complicated issues arose and the time consuming.

Patient flow analysis is very significant in healthcare settings as it provides important inputs in applying numerous approaches to improve the efficiency of the processes (Ammari, 1991). In DMH, clinic procedure was streamlined with effective utilization of the existing space at the intervention. This facilitated on

Waiting time is a dynamic feature which is sensitive for many factors. Within the same healthcare setting, waiting time can be different based on the nature of the visit (Almomani & Alsarheed, 2016). As per the literature, waiting time has been a top most challenge in improving the quality of service in most of the government healthcare settings in Sri Lanka. Late Medical Officer (MO) arrival issues and early arriving patients have been identified as major issues for long waiting time in most of Sri Lankan healthcare settings (Priyadarshanie et al., 2017). However in DMH, it was noticed that most of came on time to their duty but early arrival was common before the intervention.

COVID-19 pandemic challenged the existing procedures in health care settings and alternative protocols are invited to carry out the routine healthcare services in a different ways (Pitale, 2020). Requesting time lapse appointments for ANC has become more prominent during COVID-19 pandemic in healthcare settings in many countries (Du, 2020). The newly introduced clinic schedule with appointment based system effectively managed the congestion at the clinic and it was much convenient for the staff to manage the pregnant women within the space adhering to the basic COVID-19 guidelines. Furthermore, it was a good intervention to manage high risk pregnant women as well.

This approach also prevented the early arrivals of pregnant

women and effectively reduced the pregnant mother congestion in the clinic while maintaining the social distance.

It has found that the patient care given by the public sector healthcare setting is very good when compared with the private sector. Limited resources and lower adaptability to the technology are two major limitations identified in public sector healthcare settings (Rannan-Eliya, 2015). In DMH, still conventional methods were used for number issuing, sample labelling, data entering and waiting number calling. Applied interventions saved time and improved the satisfaction of both pregnant women and the health staff. The additional effort made to organize the pregnant women in the queue was reduced with the establishment of the digital waiting number calling system.

Antenatal education programs do a great service in promoting ANC (Myer & Harrison, 2003). In Sri Lankan context, use of the internet as a source of antenatal education is very poor (1.6%) and the major resource person is the midwife or the ANC classes conducted in clinics (90.3%). It has found that pregnant women have lower confidence about their deliveries due to lack of antenatal education as the pandemic has affected access to regular health education channels (Patabendige, 2021). Provisions of antenatal education through distance learning techniques were very effective according to pregnant women.

IV. CONCLUSION

Overall the study showed that there is a significant improvement in pregnant women's satisfaction on measures taken for COVID-19 risk mitigation, waiting time and antenatal education provided except facilities available and the care provided by the health staff. Waiting time was significantly reduced. Therefore the outcome evaluation shows that the intervention implemented had been successful in improving the process and practices of the antenatal clinic at DMH.

This study recommends introducing e-health system for DMH ANC clinic for pregnant women information management and implementing a method to measure the feedback of the pregnant mothers at the clinic which would be a better approach for customer centered care which was not addressed by the intervention. Data obtained from satisfactory surveys will facilitate identifying major quality defects in the existing process.

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