

Original Article

A Comparative Analysis of Healthcare Facilities: With and Without 24/7 Interventions

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ABSTRACT

Background: Maternal and neonatal mortality remains disproportionately high in low and middle-income countries, particularly in remote areas with limited healthcare accessibility. The Tharparkar district of Sindh, Pakistan, exemplifies such challenges, with basic utilities and healthcare services notably lacking.

Objective: This study aimed to assess the impact of 24/7 availability of Maternal, Newborn, and Child Health (MNCH) services on healthcare delivery and patient outcomes in government healthcare facilities in the Tharparkar district.

Methods: This action research followed a cross-sectional study design. Data collection commenced after receiving ethical approval and written consent from the Government District Health Officer of Tharparkar. Longitudinal data were collected using District Health Information tools from six healthcare facilities, three of which operated 24/7 and the remaining three for six hours daily. Data included indicators such as general outpatient department (OPD) visits, non-vaginal deliveries (NVD), antenatal, postnatal care, family planning, immunization, neonatal deaths, stillbirths, and live births. Statistical analysis was conducted using SPSS version 25, and results were visualized using Tableau 2024.

Results: Facilities operating 24/7 reported a significant increase in healthcare utilization: general OPD attendance increased by 118.5% at THQ Kheeme Jo Par, 168.2% at GD Jese Jo Par, and 150.5% at GD Mehrna Vero. There were also notable improvements in NVD, antenatal, postnatal care, and family planning services. Immunization rates improved, stillbirths decreased, and there were zero neonatal deaths reported in these facilities following the intervention.

Conclusion: The implementation of 24/7 MNCH services in Tharparkar significantly enhanced healthcare service delivery and improved maternal and child health outcomes. Continuous healthcare availability is crucial for improving health indicators and achieving global health targets in underserved populations.

Keywords: 24/7 healthcare, maternal health, neonatal health, public health, rural healthcare, healthcare accessibility, MNCH services, Tharparkar, maternal mortality, child health indicators.

INTRODUCTION

Maternal mortality remains disproportionately high in rural areas of third-world countries, with the World Health Organization reporting that approximately 800 women died daily in 2020 due to complications related to pregnancy and childbirth (1,2,3). The same period saw an alarming rate of neonatal deaths, with nearly 2.5 million newborns dying annually (4). From 2000 to 2020, the global Maternal Mortality Ratio (MMR) increased by 34%, representing a tragic loss of around 3 million women's lives over a decade and highlighting severe health inequalities and human rights violations worldwide (2,5).

In Pakistan, the situation is particularly dire, with one of the highest MMRs among third-world countries. In 2019, Pakistan reported an MMR of 186 deaths per 100,000 live births, which escalates to 199 deaths per 100,000 live births in rural areas compared to 154 in urban settings (7,8). Factors contributing to these poor outcomes include inadequate education for women, prevalent anemia, undernourishment, and a higher likelihood of premature and underweight births due to substandard maternal and newborn care facilities (6). The primary and district-level healthcare facilities, especially in regions like Sindh, are notably deficient in quality (9).

Addressing these challenges is critical in light of the Sustainable Development Goals (SDGs) and Millennium Development Goals (MDGs), which prioritize improving health outcomes for mothers, newborns, and children (10). Despite significant efforts, maternal

and child mortality rates remain alarmingly high (14). The availability of Maternal Newborn Child Healthcare (MNCHC) services is crucial, as they not only provide essential care but also manage complications during pregnancy, childbirth, and the postnatal period. These services are pivotal in promoting healthy behaviors and improving overall health outcomes for mothers and children (11,12,13).

The critical need for around-the-clock MNCHC services cannot be overstated, as their availability is essential for meeting global health standards related to maternal and child health (14). This research paper underscores the impact of continuous access to MNCHC services on healthcare outcomes, illustrating significant disparities when such services are unavailable.

MATERIAL AND METHODS

This study is grounded in ontological realism and employs an action research strategy with a cross-sectional time horizon. The authors commenced data collection upon obtaining written consent from the Government District Health Officer of Tharparkar (Reference No: DHO/TPR/Gen/-7750/52, dated 8 May 2023). Data was systematically gathered using District Health Information (DHI) tools, focusing on key indicators from government healthcare facilities. These indicators included metrics from the general outpatient department (OPD), non-vaginal delivery (NVD), antenatal care, postnatal care, and family planning services. Additional data were collected on variables related to the labor room, such as immunization rates, neonatal deaths, stillbirths, and the survival of children post-birth.

The study analyzed data from six healthcare facilities within the district. Three of these facilities operated on a limited schedule of six hours per day, while the other three provided services 24/7 throughout the same year. This arrangement allowed for a direct comparison of healthcare outcomes between facilities with extended hours and those with more restricted service times.

The increase in patient numbers at the general OPD post-intervention was particularly notable. All collected data were initially inputted into Microsoft Excel for organization and preliminary analysis. Subsequently, the data was transferred and analyzed using SPSS version 25 for more sophisticated statistical analysis. Visualization of healthcare performance indicators was achieved through the creation of column charts in Tableau 2024, illustrating the differences in service impact between the two sets of facilities.

Ethical considerations were rigorously observed in accordance with the Declaration of Helsinki. The study ensured that all participants were informed about the nature of the research and the intended use of the data collected, with full confidentiality maintained. The ethical approval from the local ethics committee was documented, ensuring that all procedures performed were under the highest ethical standards. The outcomes of this research provide critical insights into the effectiveness of 24/7 healthcare services compared to more limited operational hours, highlighting significant implications for public health policy and resource allocation in underserved regions.

RESULTS

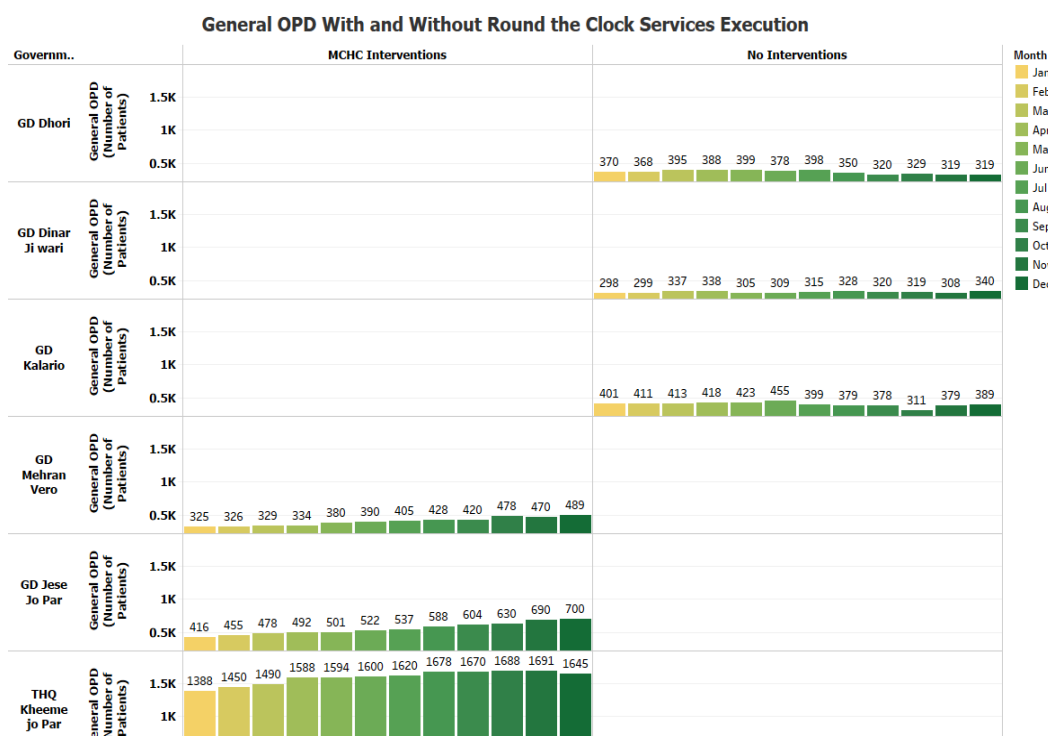


Figure 1 The growth in the general OPD of the government dispensaries.

The evaluation of the impact of 24/7 operational hours in Government healthcare facilities, as depicted in Figure 1, illustrates a dramatic increase in patient attendance at the general OPDs following the intervention. Specifically, healthcare facilities that transitioned to round-the-clock service observed substantial increases: THQ Kheeme Jo Par reported a 118.5% rise in patient numbers in December 2020, GD Jese Jo Par saw a 168.2% increase, and GD Mehrna Vero experienced a 150.5% surge. In stark contrast, the facilities operating only six hours per

day—GD Dinar Ji Wari, GD Dhori, and GD Kalario—showed no increase in patient numbers, underscoring the significant influence of extended operational hours on accessibility and service uptake.

Further analysis revealed notable improvements in specific maternal and child healthcare (MCHC) services due to the extended hours, as presented in Figure 2. Non-vaginal deliveries (NVD) were particularly impacted, with marked increases only in the 24/7 facilities; GD Jese Jo Par and GD Kheeme Jo Par led these statistics, likely reflecting the higher population densities they serve. This extension of hours also facilitated increased consultations for family planning, with a clear upward trend observed across all day-and-night operational facilities. Antenatal and postnatal care services similarly showed significant gains, unlike the limited-hour facilities, which recorded no such activities.

Labor room performance indicators, detailed in Figure 3, further highlight the benefits of the 24/7 model. Immunization rates for newborns, including polio and hepatitis vaccines, were exclusively reported in facilities with extended hours.

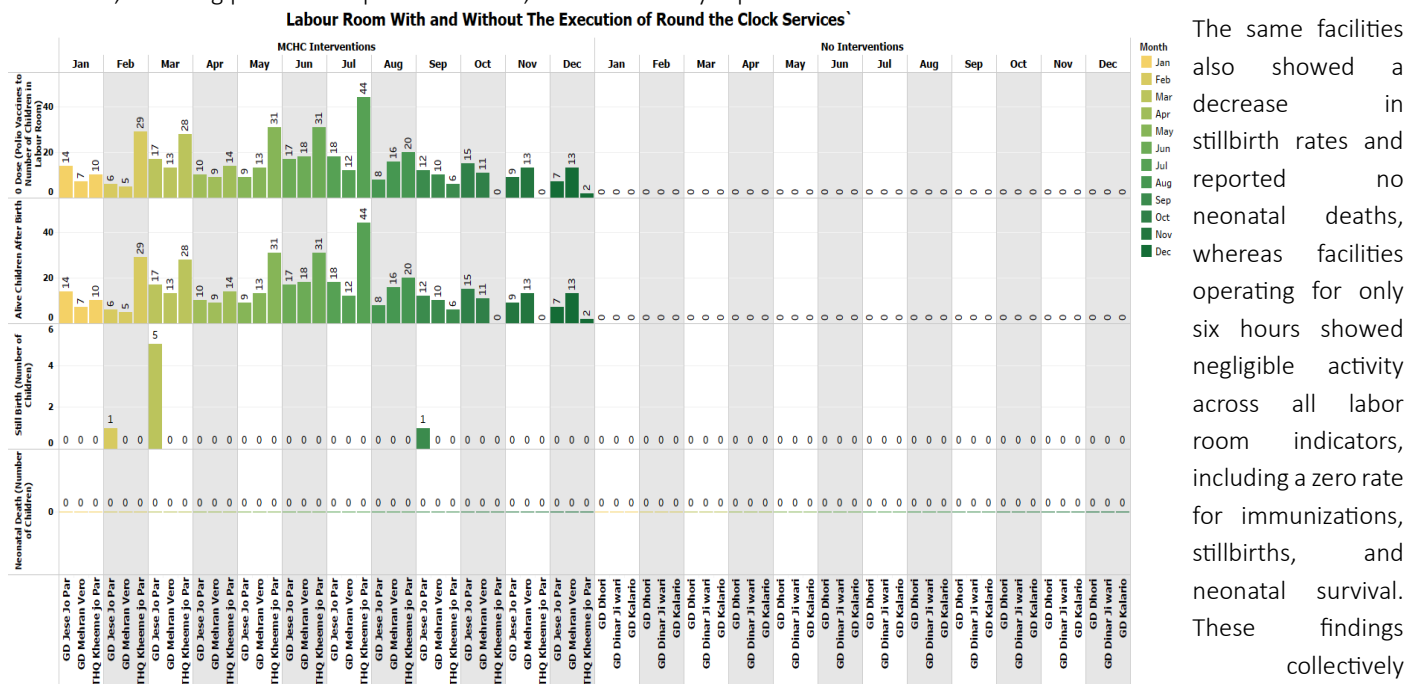


Figure 2 The graphical representation of increased MCHC services at the healthcare facilities with and without 24/7 intervention

The same facilities also showed a decrease in stillbirth rates and reported no neonatal deaths, whereas facilities operating for only six hours showed negligible activity across all labor room indicators, including a zero rate for immunizations, stillbirths, and neonatal survival. These findings collectively underscore the critical impact of 24/7 operational

availability in enhancing healthcare service delivery and addressing the healthcare needs in underserved populations effectively.

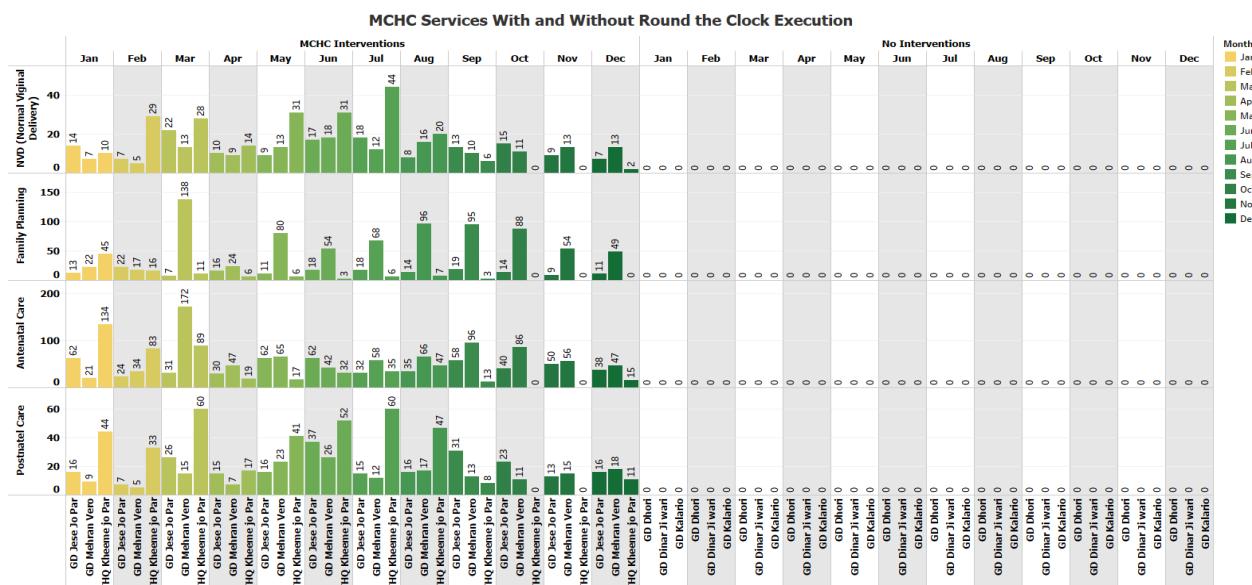


Figure 3 The graphical representation of increased labor room services at the healthcare facilities with and without 24/7 intervention

DISCUSSION

The study conducted in the Tharparkar district of Sindh, Pakistan, demonstrated a profound impact of 24/7 maternal, newborn, and child health (MNCH) services on the frequency and quality of healthcare delivery, particularly for maternal and child health outcomes. Prior research highlights the crucial role of continuous healthcare provision, especially in low and middle-income countries where maternal and neonatal risks are prevalent (15,16). This study's findings corroborate these insights, showing significant increases in patient attendance and service utilization at facilities offering round-the-clock care compared to those with limited operating hours.

The introduction of 24/7 MNCH services led to an impressive increase in general OPD attendance, with facilities like GD Mehran Vero, GD Jese Jo Par, and THQ Kheeme Jo Par experiencing rises of 150.4%, 168.3%, and 118.51%, respectively. These increases are indicative of the enhanced access to healthcare that continuous service provision offers (11,17). Furthermore, the increase in non-vaginal deliveries (NVDs) and the uptake of antenatal, postnatal care, and family planning services underscore the critical importance of availability and accessibility in healthcare. Facilities without round-the-clock operations reported no similar increases, highlighting a stark disparity in healthcare access and utilization due to operational limitations (18).

Ahmed et al. (2021) argued for the necessity of evidence-based interventions in the healthcare system of Sindh to mitigate illness and mortality among newborns (18). This study supports such claims, demonstrating that continuous MNCH services can facilitate timely and effective care, leading to improved health outcomes. Notably, the zero incidences of neonatal deaths and the successful immunization of children at birth in 24/7 facilities exemplify the potential for significant health improvements through such interventions (19).

However, the study is not without limitations. The geographical and infrastructural challenges of the Tharparkar district, such as limited access to water, electricity, and network connectivity, may impede the generalizability of the findings to other regions. Additionally, the study focused on a limited number of healthcare facilities, which might not fully capture the variability and complexities of implementing 24/7 services across different settings (20).

Despite these limitations, the study offers substantial evidence of the benefits of continuous healthcare provision, especially for underserved populations. It strongly suggests that extending operational hours can lead to better health outcomes, more effective disease prevention, and greater patient satisfaction (18-20). The findings are particularly relevant for policymakers and healthcare providers aiming to enhance healthcare accessibility and quality. Future recommendations include expanding 24/7 healthcare services to more facilities, particularly in remote and underserved areas, and conducting further research to explore the long-term impacts of such interventions on maternal and neonatal mortality rates.

CONCLUSION

In conclusion, the availability of 24/7 MNCH services significantly enhances healthcare delivery and outcomes, particularly for maternal and child health. This study contributes valuable insights into the operational and strategic enhancements needed to improve public health in challenging environments, aligning with global health targets, and improving the lives of those in marginalized communities.

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