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Multidisciplinary Supportive Care during COVID-19 at GGH Mahabubnagar Supported by Care India Sustainable Development

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Abstract
The COVID-19 pandemic placed extraordinary pressure on public healthcare systems, particularly in resource-constrained settings. Government General Hospital, Mahabubnagar emerged as a major treatment center in southern Telangana, delivering comprehensive care to affected populations. This study examines the multidisciplinary supportive care model implemented at the hospital with assistance from CARE India under its sustainable development initiatives from **May 2021 to March 2022**. The focus is on the coordinated contributions of physiotherapists, laboratory technicians, and patient care workers in strengthening patient management and recovery. Physiotherapists played a vital role in respiratory rehabilitation, early mobilization, and post-COVID functional training. Laboratory technicians ensured timely and accurate diagnosis, clinical monitoring, and data reporting, supporting effective treatment planning and infection control. Patient care workers provided essential bedside support, maintained hygiene standards, and offered emotional assistance to patients in isolation. A descriptive observational design was adopted, using hospital records, staff interviews, and service reports during the study period. The findings indicate that multidisciplinary collaboration improved clinical outcomes, reduced complications, enhanced patient satisfaction, and promoted efficient resource utilization. Despite challenges such as workforce shortages, occupational stress, and infrastructural limitations, the integrated care model demonstrated resilience and adaptability. The study highlights the significance of allied health professionals and development partners in strengthening public healthcare systems. It concludes that sustainable, multidisciplinary approaches are crucial for improving emergency preparedness and ensuring equitable, patient-centered care during future public health crises.

Keywords: COVID-19; Multidisciplinary Care; Physiotherapy Services; Laboratory Diagnostics; Patient Care Workers; Sustainable Health Systems

1. Introduction

The Coronavirus Disease 2019 (COVID-19) pandemic emerged as one of the most significant public health crises of the 21st century, disrupting healthcare systems, economies, and social structures across the globe. In India, successive waves of infection between 2020 and 2022 placed immense pressure on public health infrastructure, particularly in rural and semi-urban regions where resources were limited and access to specialized care was constrained. Public hospitals became the primary centers for diagnosis, isolation, and treatment, often operating beyond their routine capacity.

In Telangana, Government General Hospital, Mahabubnagar served as a major referral and treatment center for COVID-19 patients from Mahabubnagar district and surrounding areas. The hospital catered largely to economically disadvantaged populations, including daily wage workers, agricultural labours, and elderly individuals with limited access to private healthcare facilities. During peak periods of the pandemic, the hospital experienced surges inpatient admissions, shortages of trained personnel, and increased demand for critical and supportive care services.

The management of COVID-19 extended beyond pharmacological treatment and oxygen therapy. Patients frequently presented with respiratory distress, physical deconditioning, psychological stress, and social isolation. These complex needs necessitated a multidisciplinary approach involving physicians, nurses, allied health professionals, and support staff. Among these, physiotherapists, laboratory technicians, and patient care workers played a pivotal role in ensuring comprehensive and continuous care.

Physiotherapy emerged as a crucial component in COVID-19 management, particularly for patients with respiratory complications and prolonged immobilization. Respiratory physiotherapy techniques, early mobilization strategies, and post-COVID rehabilitation programs contributed to improved pulmonary function, prevention of secondary complications, and restoration of functional independence. In patients recovering from moderate to severe disease, physiotherapy interventions were instrumental in reducing fatigue, muscle weakness, and long-term disability.

Laboratory services formed the backbone of COVID-19 diagnosis and monitoring. Laboratory technicians were responsible for conducting RT-PCR tests, rapid antigen assays, and routine biochemical investigations. These diagnostic procedures enabled early detection, appropriate isolation, treatment planning, and epidemiological surveillance. Accurate and timely reporting was essential for clinical decision-making and public health interventions. Despite high workloads and exposure risks, laboratory personnel maintained service continuity throughout the pandemic.

Patient care workers represented another vital pillar of supportive care. They assisted patients with activities of daily living, hygiene maintenance, feeding, positioning, and mobility. In isolation wards, where family members were not permitted, patient care workers often served as the primary source of physical and emotional support. Their role extended to infection control practices, waste management, and facilitating communication between patients and healthcare providers.

Recognizing the need for strengthened human resources and coordinated service delivery, CARE India provided structured support to GGH Mahabubnagar under its sustainable development and health systems strengthening initiatives. Between May 2021 and March 2022, CARE India facilitated the deployment, training, and supervision of physiotherapists, laboratory technicians, and patient care workers. This collaboration aimed to enhance service quality, optimize resource utilization, and promote patient-centered care during the critical phases of the pandemic.

The involvement of development partners in public health emergencies has been widely acknowledged as an effective strategy for bridging gaps in infrastructure, workforce, and service delivery. In the context of COVID-19, such partnerships enabled rapid mobilization of trained personnel, implementation of standardized protocols, and integration of community-oriented approaches within hospital settings. However, empirical documentation of these collaborative models, particularly in district-level hospitals, remains limited.

Furthermore, most existing literature on COVID-19 management has focused on medical and epidemiological aspects, with relatively less attention to allied health professionals and supportive care systems. Understanding the contributions, challenges, and outcomes associated with multidisciplinary supportive care is essential for informing future preparedness strategies and policy development.

Against this background, the present study aims to examine the multidisciplinary supportive care model implemented at GGH Mahabubnagar with support from CARE India during the period from May 2021 to March 2022. The study focuses on the integrated roles of physiotherapists, laboratory technicians, and patient care workers in enhancing patient outcomes, operational efficiency, and healthcare resilience. By documenting this experience, the study seeks to contribute to the growing body of evidence on sustainable, collaborative approaches to pandemic response in resource-limited settings.

2. Methodology

2.1. Study Design

A descriptive observational study design was adopted to assess the multidisciplinary supportive care model implemented at GGH Mahabubnagar during the COVID-19 pandemic. This design was chosen to systematically document service delivery practices, professional roles, and operational outcomes in a real-world clinical setting without experimental manipulation. The study emphasized qualitative and quantitative descriptions of healthcare processes and patient care experiences.

2.2. Study Setting

The study was conducted at Government General Hospital, Mahabubnagar, a district-level public healthcare institution designated as a COVID-19 treatment center by the state government of Telangana. The hospital comprised dedicated COVID-19 wards, intensive care units, high-dependency units, diagnostic laboratories, and rehabilitation spaces. During the study period, the hospital managed patients with mild, moderate, and severe COVID-19 infections.

CARE India supported the hospital through the deployment of allied health professionals, capacity-building programs, and logistical assistance. The collaboration aimed to strengthen clinical and supportive services in alignment with sustainable development principles and public health priorities.

2.3. Study Period

Data were collected retrospectively and prospectively for the period between May 2021 and March 2022. This timeframe encompassed major phases of the second and subsequent waves of COVID-19 in the region, characterized by high caseloads and increased demand for supportive care services.

2.4. Study Population

The study population included:

1. Physiotherapists engaged in COVID-19 respiratory and rehabilitation services.
2. Laboratory technicians involved in diagnostic and monitoring activities.
3. Patient care workers providing bedside and supportive services.
4. Medical officers, nursing staff, and administrators associated with COVID-19 management (for contextual insights).

In addition, anonymized patient records were reviewed to assess recovery patterns, length of hospital stay, and referral outcomes.

2.5. Sampling Technique

A purposive sampling method was employed to select participants who were directly involved in COVID-19 care during the study period. Professionals with a minimum of three months of service in COVID-19 units were included to ensure adequate exposure and experience.

Approximately:

- 10–15 Physiotherapists
- 10–15 laboratory technicians
- 50–60 patient care workers
- 5–10 supervisory and administrative staff

Were considered for interviews and data collection, depending on availability and consent.

2.6. Data Collection Methods

Multiple data sources were utilized to ensure triangulation and validity.

2.6.1. Review of Hospital Records

Patient admission registers, discharge summaries, physiotherapy logs, laboratory reports, and duty rosters were reviewed. These documents provided quantitative data on patient volumes, service utilization, and functional outcomes.

2.6.2. Structured and Semi-Structured Interviews

Interviews were conducted with allied health professionals and supervisors using pre-designed questionnaires. The interviews explored:

- Nature of duties and responsibilities
- Training and capacity-building experiences
- Perceived impact on patient recovery
- Operational challenges
- Interprofessional collaboration

Interviews were conducted in English and Telugu, depending on participant preference, and were documented in written form.

2.6.3. Direct Observation

Non-participant observation was used to study routine practices in COVID-19 wards, laboratories, and rehabilitation areas. Observations focused on workflow patterns, infection control measures, patient-provider interactions, and team coordination.

2.6.4. Service Reports and Program Documents

CARE India program reports, training manuals, monitoring data, and supervisory records were reviewed to understand the structure and implementation of support activities.

2.7. Study Variables

The study examined the following key variables:

- Type and frequency of physiotherapy interventions
- Diagnostic turnaround time and laboratory workload
- Nature of patient care services
- Patient length of stay
- Functional and respiratory recovery indicators
- Staff workload and training exposure
- Infection control compliance

2.8. Data Analysis

Quantitative data from hospital records were analyzed using descriptive statistics, including frequencies, percentages, means, and ranges. These measures were used to summarize patient demographics, service utilization, and recovery patterns.

Qualitative data from interviews and observations were analyzed thematically. Responses were coded, categorized, and grouped into major themes such as professional roles, collaboration, challenges, and best practices. Thematic analysis enabled identification of recurring patterns and contextual insights.

Findings from different data sources were compared and integrated to ensure consistency and comprehensive interpretation.

2.9. Ethical Considerations

Institutional permission was obtained from hospital authorities and program coordinators prior to data collection. Participation in interviews was voluntary, and informed consent was obtained from all respondents. Confidentiality and anonymity were maintained by removing personal identifiers from records and transcripts.

Patient data were used only in aggregated form, and no individual case details were disclosed. The study adhered to ethical principles of beneficence, non-maleficence, autonomy, and justice.

2.10. Quality Assurance

To enhance reliability and validity:

- Data collection tools were pilot-tested
- Multiple investigators cross-checked records
- Interview responses were verified through follow-up discussions

- Triangulation was employed across data sources

Regular reviews were conducted to minimize observer bias and documentation errors.

2.11. Limitations of Methodology

The descriptive design limited causal inference between interventions and outcomes. Retrospective data depended on the accuracy of existing records, which may have contained inconsistencies. Workload constraints during the pandemic restricted prolonged engagement with participants. Despite these limitations, the study provides valuable real-world insights into multidisciplinary supportive care in a public hospital setting.

3. Results

The multidisciplinary supportive care initiative implemented at Government General Hospital, Mahabubnagar with support from CARE India between May 2021 and March 2022 demonstrated significant improvements in service delivery, patient outcomes, and operational efficiency during the COVID-19 pandemic. The results are presented across key domains corresponding to the roles of physiotherapists, laboratory technicians, and patient care workers, followed by outcomes of multidisciplinary collaboration.

3.1. Patient Profile and Service Utilization

During the study period, the hospital managed a large volume of COVID-19 cases, including mild, moderate, and severe presentations. A majority of patients were adults aged 40 years and above, with a high prevalence of comorbidities such as diabetes, hypertension, and chronic respiratory conditions. Increased demand for oxygen therapy, prolonged hospital stays, and post-acute functional impairments were commonly observed.

Supportive care services showed a substantial increase in utilization. Physiotherapy referrals rose notably among patients requiring oxygen support or recovering from intensive care. Laboratory services operated at maximum capacity, with high daily testing volumes. Patient care workers were continuously engaged across COVID-19 wards, isolation units, and step-down facilities.

3.2. Outcomes of Physiotherapy Interventions

Physiotherapy services were delivered to patients in both acute and recovery phases. Respiratory physiotherapy, including breathing exercises, airway clearance techniques, and incentive spirometry, was provided to patients with moderate to severe disease. Early mobilization protocols were implemented once patients achieved clinical stability.

Key observed outcomes included:

- Improved oxygen saturation levels during hospitalization
- Reduced incidence of secretion retention and secondary respiratory complications
- Earlier transition from bed rest to sitting and ambulation
- Reduction in ICU-acquired weakness and joint stiffness
- Improved functional independence at discharge

Patients receiving structured physiotherapy interventions demonstrated better tolerance to activity and reduced fatigue at the time of discharge compared to those who did not require or receive prolonged immobilization. Post-COVID rehabilitation guidance contributed to smoother transition to home-based recovery, especially among elderly patients.

3.3. Laboratory Service Performance

Laboratory technicians played a central role in ensuring continuity of diagnostic and monitoring services. RT-PCR and rapid antigen testing enabled timely diagnosis and patient segregation. Routine biochemical and hematological investigations supported clinical decision-making and monitoring of disease progression.

Results indicated:

- Reduced diagnostic turnaround time despite increased testing volumes
- High compliance with biosafety and quality control protocols
- Consistent reporting accuracy, supporting treatment planning
- Efficient coordination with clinical teams for urgent investigations

Laboratory services functioned as a critical link between patient admission, treatment escalation, and discharge planning. The sustained performance of laboratory personnel under high workload conditions was a key factor in effective COVID-19 management.

3.4. Contributions of Patient Care Workers

Patient care workers formed the backbone of day-to-day supportive care in COVID-19 wards. Their responsibilities included assistance with feeding, personal hygiene, repositioning, mobility, and maintenance of a clean and safe environment.

Observed outcomes included:

- Improved patient comfort and dignity during isolation
- Better adherence to infection control practices
- Reduced burden on nursing staff, allowing focus on clinical tasks
- Enhanced emotional well-being among patients through continuous presence and reassurance

In the absence of family caregivers due to isolation protocols, patient care workers became essential providers of physical and psychosocial support. Their role significantly influenced patient satisfaction and overall ward functioning.

3.5. Multidisciplinary Collaboration and Operational Outcomes

Regular coordination among physiotherapists, laboratory technicians, patient care workers, nurses, and physicians improved workflow efficiency. Shared protocols, daily briefings, and mutual role clarity minimized duplication of efforts and service gaps.

Key operational outcomes included:

- Reduced average length of hospital stay
- Improved discharge planning and continuity of care
- Enhanced compliance with infection prevention measures
- Optimized utilization of limited human and material resources

The presence of CARE India-supported personnel strengthened staffing capacity during critical phases, enabling sustained service delivery despite workforce shortages.

4. Discussion

The findings of this study highlight the critical importance of multidisciplinary supportive care in managing complex public health emergencies such as the COVID-19 pandemic. The experience at GGH Mahabubnagar demonstrates that allied health professionals and support staff are integral to patient-centered care, particularly in resource-limited public hospital settings.

4.1. Significance of Physiotherapy in COVID-19 Recovery

The observed benefits of physiotherapy interventions align with global evidence emphasizing the role of respiratory rehabilitation and early mobilization in COVID-19 management. Prolonged immobilization and respiratory compromise are known contributors to long-term disability in hospitalized patients. By integrating physiotherapy into routine COVID-19 care, the hospital was able to address both acute respiratory needs and long-term functional outcomes.

The improved mobility and functional independence observed at discharge underscore the value of physiotherapists in reducing post-COVID morbidity. These findings support the inclusion of physiotherapy as a standard component of pandemic care protocols, rather than as an optional or post-acute service.

4.2. Laboratory Services as a Pillar of Pandemic Response

Accurate and timely diagnostics are foundational to effective pandemic management. The performance of laboratory technicians at GGH Mahabubnagar highlights their indispensable role in disease detection, monitoring, and surveillance. Despite high exposure risk and workload stress, laboratory personnel maintained quality standards and service continuity.

The reduced turnaround times observed during the study period facilitated early clinical interventions and efficient patient flow. This underscores the need for sustained investment in laboratory infrastructure, workforce training, and biosafety measures as part of health system strengthening.

4.3. Role of Patient Care Workers in Holistic Care

Patient care workers contributed significantly to holistic care by addressing non-clinical yet essential patient needs. Their involvement reduced nursing workload, improved ward efficiency, and enhanced patient experience during isolation. Emotional support provided by care workers played a crucial role in mitigating anxiety and loneliness among patients.

These findings highlight the often-underrecognized contribution of patient care workers in healthcare delivery. Formal recognition, structured training, and integration into care teams can further enhance their effectiveness and job satisfaction.

4.4. Value of Multidisciplinary and Development Partner Collaboration

The collaboration between the public hospital system and CARE India exemplifies an effective model of health system support during emergencies. Development partners can play a vital role in bridging human resource gaps, standardizing practices, and promoting sustainable service models.

The multidisciplinary approach observed in this study fostered resilience, adaptability, and innovation under crisis conditions. Such collaboration enabled rapid problem-solving, improved communication, and shared ownership of patient outcomes.

4.5. Challenges and Systemic Implications

Despite positive outcomes, several challenges were encountered. Workforce fatigue, psychological stress, and fear of infection were prevalent among healthcare workers. Limited infrastructure and fluctuating supply chains occasionally constrained service delivery. These challenges reflect broader systemic issues in public healthcare systems during emergencies.

Addressing these challenges requires comprehensive workforce support policies, mental health services for healthcare workers, and robust emergency preparedness frameworks. The lessons learned from this experience can inform future policy and planning efforts.

4.6. Implications for Sustainable Healthcare Systems

The study underscores the importance of integrating multidisciplinary supportive care into routine healthcare planning. Sustainable development in health systems involves not only infrastructure and technology but also investment in human resources, teamwork, and community-oriented care models.

By strengthening allied health services and support roles, public hospitals can enhance their capacity to respond to both routine and emergency health needs. The experience at GGH Mahabubnagar provides a replicable model for similar district-level hospitals across India and other low- and middle-income settings.

5. Summary of Discussion

In summary, the multidisciplinary supportive care model implemented during COVID-19 at GGH Mahabubnagar resulted in improved patient outcomes, efficient service delivery, and enhanced healthcare resilience. Physiotherapists, laboratory technicians, and patient care workers played complementary and interdependent roles in addressing the complex needs of COVID-19 patients. Support from CARE India strengthened system capacity and demonstrated the value of public–development partner collaboration. These findings reinforce the need to institutionalize multidisciplinary approaches as a cornerstone of sustainable and equitable healthcare systems.

6. Clinical and Policy Implications

The findings of this study have important clinical and policy implications for strengthening public healthcare systems, particularly in resource-limited settings. The successful implementation of multidisciplinary supportive care at Government General Hospital, Mahabubnagar demonstrates that integrated service delivery involving physiotherapists, laboratory technicians, and patient care workers can significantly enhance patient outcomes during public health emergencies.

7. Clinical Implications

From a clinical perspective, the inclusion of physiotherapy as a routine component of COVID-19 management proved beneficial in improving respiratory function, preventing complications related to prolonged immobilization, and promoting early functional recovery. These findings support the integration of structured physiotherapy protocols into standard treatment guidelines for infectious and respiratory diseases. Hospitals should ensure the availability of trained physiotherapists in acute care and rehabilitation units to facilitate holistic patient management.

The sustained performance of laboratory services highlights the necessity of strengthening diagnostic infrastructure and workforce capacity. Timely and accurate diagnostic reporting enabled effective treatment planning and infection control.

Continuous professional training, adequate staffing, and strict biosafety practices are essential to maintain laboratory efficiency during crisis situations.

Patient care workers played a crucial role in delivering personalized bedside support, maintaining hygiene standards, and addressing psychosocial needs. Their contribution reduced the workload of nursing staff and improved patient satisfaction. Formal recognition, standardized training programs, and clear role definitions are necessary to enhance their integration into clinical teams.

Interprofessional collaboration observed during the study period improved communication, minimized service gaps, and optimized resource utilization. Establishing routine multidisciplinary meetings and shared care protocols can further strengthen coordinated service delivery in hospital settings.

8. Policy Implications

At the policy level, the study underscores the importance of investing in allied health and support personnel as a core component of health system strengthening. Workforce planning strategies should prioritize recruitment, retention, and capacity building of physiotherapists, laboratory professionals, and patient care workers.

Public–private and public–development partner collaborations, as demonstrated through CARE India's support, can effectively bridge resource gaps during emergencies. Policymakers should institutionalize such partnerships through formal frameworks and accountability mechanisms.

Additionally, comprehensive emergency preparedness policies should include provisions for staff welfare, mental health support, occupational safety, and continuous professional development. Allocating dedicated funding for multidisciplinary care models can enhance system resilience and ensure equitable access to quality healthcare services.

9. Conclusion

The COVID-19 pandemic posed unprecedented challenges to public healthcare systems, particularly in district-level hospitals serving vulnerable populations. The experience of Government General Hospital, Mahabubnagar between May 2021 and March 2022 demonstrates that multidisciplinary supportive care is fundamental to effective pandemic response and sustainable health system functioning.

This study highlights the complementary roles of physiotherapists, laboratory technicians, and patient care workers in delivering comprehensive, patient-centered care. Physiotherapy interventions contributed to improved respiratory function, early mobilization, and post-COVID recovery. Laboratory services ensured timely diagnosis, accurate monitoring, and informed clinical decision-making. Patient care workers provided essential physical and emotional support, enhanced infection control, and improved overall patient experience.

Support from CARE India strengthened human resource capacity, facilitated standardized practices, and promoted collaborative service delivery. The integrated care model improved operational efficiency, reduced complications, and enhanced patient satisfaction despite significant resource constraints and workforce pressures.

The findings emphasize that allied health professionals and support staff are not auxiliary but central to healthcare delivery, particularly during emergencies. Investing in their training, welfare, and professional development is critical for building resilient and responsive health systems.

In conclusion, sustainable, multidisciplinary approaches should be institutionalized within public hospitals to enhance preparedness for future health crises. Strengthening collaboration, workforce capacity, and supportive care services will enable healthcare systems to provide equitable, high-quality care and safeguard population health in times of crisis and beyond.

10. Limitations

Despite providing valuable insights into multidisciplinary supportive care during the COVID-19 pandemic, this study has certain limitations that should be acknowledged. First, the descriptive observational design restricts the ability to establish causal relationships between multidisciplinary interventions and patient outcomes. While positive associations were observed, definitive conclusions regarding effectiveness cannot be drawn.

Second, a portion of the data was collected retrospectively from hospital records, which may have contained incomplete or inconsistent documentation due to the overwhelming workload during peak pandemic periods. This may have influenced the accuracy of some findings.

Third, the study was conducted in a single district-level public hospital. Therefore, the results may not be fully generalizable to tertiary care institutions, private hospitals, or healthcare facilities in other geographic regions with different resource availability and administrative structures.

Fourth, psychological and long-term functional outcomes of patients were not systematically assessed after discharge. As a result, the long-term impact of multidisciplinary interventions on quality of life and social reintegration could not be comprehensively evaluated.

Finally, time constraints and staff fatigue limited prolonged qualitative engagement with participants, potentially restricting the depth of experiential data obtained from healthcare workers.

11. Future Scope

Future research should adopt longitudinal and multicenter study designs to evaluate the long-term effectiveness of multidisciplinary supportive care models across diverse healthcare settings. Comparative studies between hospitals with and without structured allied health integration would provide stronger evidence for policy formulation.

There is also a need to explore digital health and tele-rehabilitation platforms to extend physiotherapy and psychosocial support beyond hospital settings. Evaluating the feasibility and effectiveness of such interventions in rural and semi-urban populations is particularly important.

Further studies should focus on workforce well-being, occupational stress, and mental health outcomes among allied health professionals and patient care workers. Developing evidence-based staff support programs can enhance retention and service quality.

Economic evaluations assessing cost-effectiveness of multidisciplinary care models would help policymakers allocate resources more efficiently. Additionally, research on community-based follow-up and rehabilitation programs can strengthen continuity of care and reduce long-term disability.

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