

**SERVICE QUALITY ASSESSMENT OF PRIVATE HOSPITALS DELIVERING EMERGENCY TRAUMA CARE UNDER  
INNUIYIR KAPPOM THITTAM IN CHENNAI**

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**ABSTRACT**

**Overview** - Innuyir Kappom Thittam which was introduced by Government of Tamil Nadu is meant to provide individuals who sustain injuries regarding accidents with prompt treatment in empanelled hospitals that comprise of both private medical institutions.

**Objectives** - The research examined the quality of services provided by the hospital in terms of responsiveness and time of initiation of the treatment to the emergency patients visiting the hospitals in the Chennai city under the service of Innuyir Kappom Thittam. The research study uses empirical research design where the primary data were gathered using 160 respondents and through a structured interview schedule using the interview method. The method of purposive sampling was used in the selection of respondents who had first-hand experience regarding the services of trauma care provided within the framework of the programme. There were multivariate statistical procedures such as factor analysis, correlation analysis and multiple regression analysis which were employed to examine the relationships between the service quality variables related to emergency trauma care.

**Results**- The study results have shown that medical personnel responsiveness, efficiency of admission processes, availability of trauma specialists, efficient diagnostic service and coordination between the hospital personnel has a major impact on the efficiency of the delivery of the trauma care services offered by the private hospitals. The analysis reveals that institutional coordination between hospitals and programme authorities are some of the factors that facilitate a smooth operation of the emergency healthcare services under the scheme.

**Conclusion** - The study concludes that enhancement of service quality dimensions in the private hospitals especially the responsiveness treatment, initiation efficiency and administrative coordination may be useful in enhancing the effectiveness of the emergency trauma care services through the Innuyir Kappom programme in Chennai.

**Keywords:** *Innuyir Kappom Thittam, Emergency Trauma Care, Hospital Service Quality, Private Healthcare Services and Emergency Treatment Response Time*

**INTRODUCTION**

**Service Quality in Emergency Healthcare Services:** Emergency trauma care takes up a center stage in the current healthcare systems due to its significant role in determining whether the injured persons will survive or not and this relies on the rate at which medical services are provided within the hospitals. The rapid urbanization has enhanced motor movement and it has escalated the frequency of injury related emergency cases in cities. The hospitals thus play a conclusive role in stabilising patients that need urgent clinical care following traumatic events. The response capabilities of healthcare institutions in real time show the quality of the hospital care delivery and the effectiveness of emergency medical systems that are working in an area. Service quality in the trauma care settings can be described as the ability of the hospitals to arrange the medical staff's diagnostic unit's treatment processes and management in the way that promotes high speed treatment commencement of the injured patients. Emergency response systems of high quality minimize the likelihood of complications accompanying the presence of severe injuries and increase the chances of recovery within the first stage of the treatment process. Studies that consider the performance of emergency departments have focused on the fact that the responsiveness of medical teams and the prompt initiation of the process of providing care is vital to indicate successful trauma care in hospitals (Asplin et al., 2003)<sup>1</sup>.

The role played by private hospitals in offering emergency healthcare services in urban set ups has been given a significant weight considering the fact that high population of people need access to high-technological medical services. There are numerous non-governmental healthcare facilities that have specialised trauma units with intensive monitoring equipment diagnostic laboratory and qualified clinical staff that can provide complex treatment procedures to injured individuals. Their involvement in emergency healthcare systems increases the ability of the cities to handle cases of trauma and offers other treatment alternatives to patients who need urgent healthcare. Research studies examining the quality of hospital services have also shown that the responsiveness of the healthcare personnel, transparency of clinical communication and effectiveness in starting treatment practices have a significant impact on patient perception of the quality of care provided in emergency rooms (Pakdil and Harwood, 2005)<sup>2</sup>. The hospitals that exhibit well-organised treatment process and medical response are thus capable of delivering healthcare settings that facilitate effective patient care in cases of emergencies.

The policy of strengthening the emergency networks in the area of trauma care has been recognized by the public health policy as a means of collaboration between governmental authorities and the private healthcare institutions. There are a number of healthcare programmes rolled out in various areas that seek to eliminate monetary barriers which may postpone treatment in cases of emergency situations and motivate the hospitals to offer immediate medical support to injured people. The policy frameworks that focus on the issue of trauma care in the event of accidents highlight the importance of the hospital starting the treatment procedures without administrative procrastination to ensure that the initial

<sup>1</sup> Asplin, B. R., Magid, D. J., Rhodes, K. V., Solberg, L. I., Lurie, N., and Camargo, C. A. (2003). A conceptual model of emergency department crowding. *Annals of Emergency Medicine*, 42(2), 173-180.  
<sup>2</sup> Pakdil, F., and Harwood, T. N. (2005). Patient satisfaction in a preoperative assessment clinic. *International Journal of Health Care Quality Assurance*, 18(6), 390-401.

phase of medical care would stabilize the situation of the patient. Such programmes usually rely on involvement of the private hospitals since these institutions have the infrastructure and clinical skills that are needed to deal with serious cases of traumas within limited time periods. The inclusion of the privately-run hospitals in the emergency care programmes thus helps in enhancing the availability of specialist facilities as well as reinforcing the healthcare response mechanism system functioning in the urban areas. The Innuyir Kappom Thittam implemented in Tamil Nadu is a governmental health program that aims to reinforce the emergency trauma care services by involving hospitals comprising of privately-operating healthcare facilities. The programme helps provide direct medical care to persons who sustain traumatic injuries as well as to hospitals to jump-start care delivery without any financial reservations in cases of emergency events. The scheme entails clinical services being offered by the private hospitals; the cost of treatment involved in the first stage of the care is then funded under the operational mechanism of the programme. These initiatives demonstrate the value of assessing the quality of emergency treatment in hospitals that provide emergency trauma care and the effectiveness of medical treatment initiation once the patients get to the healthcare facilities. The study of the quality of services offered in the context of the private hospitals that are enrolled in the emergency trauma care programmes becomes a valuable as the responsiveness of the hospital and the practices of treating patients immediately relate to the efficacy of the emergency healthcare provision. An evaluation of these operational dimensions aids in comprehending how healthcare organisations unify the medical resources to structure the medical treatment process and work with the administrative authorities in charge of executing the initiatives aimed at promoting the public health. The research hence concentrates on examining the aspects of the service quality in terms of responsiveness and the time spent initiating treatment in the private hospitals which provide trauma care under the Innuyir Kappom Thittam in Chennai. This type of study helps enhance the knowledge of hospital performance in the emergency healthcare programmes and offer insights that could help policymakers and healthcare administrators in enhancing trauma care services in the urban healthcare systems.

## REVIEWS

The topic of research that examines the service quality of hospitals in the emergency healthcare setting has gained significant coverage due to the fact that the effectiveness of services involving trauma care relies on the responsiveness of the hospital to urgently attend to patients in need of emergency medical care. Previous studies have highlighted the fact that the responsiveness of medical personnel treatment start time and the coordination of the institutions present crucial predictors of emergency care performance in hospitals. A study carried out by Wiler et al. (2010)<sup>3</sup> has investigated operation efficiency of emergency departments at various hospitals and the outcome of the study documented that in case of trauma patients, fast patient evaluation and subsequent clinical intervention played a huge role in treating the patient. The study emphasised that hospitals that had an organised emergency response system had less waiting period to start treatment and better patient survival rates when providing trauma care. A literature review on responsiveness in the emergency services has highlighted the role of timely triage process in the emergency department of a hospital. Pines et al. (2011)<sup>4</sup> evaluated the service of trauma care units of emergency departments and noted that when the hospitals had well-developed triage systems, they could easily identify severe injuries and begin treatment without time loss. The research found that timely assessment of the severity of traumas is an essential part of the service quality of emergency healthcare setting.

The research was a study by Bernstein et al. (2009)<sup>5</sup> which examined the perception of patients on the quality of the service in emergency departments and found that responsiveness of the healthcare professionals was a critical factor that affected patient trust in hospital services. This research highlighted that clinical outcomes are not the best way to assess service quality in emergency healthcare since how the hospitals assess patient arrival also plays a significant role in patient experience during treatment. The studies that were conducted to analyse hospital emergency systems have also discussed the relationship between the time of treatment initiation and the outcomes of trauma care. Lerner and Moscati (2001)<sup>6</sup> explored the phenomena of the critical treatment period in trauma management and proved that the early implementation of medical operations after the injury had a great positive effect on the survival rates. They found that delay of treatment initiation augmented the risk of complications connected to traumatic injuries that accentuated the need to comprehend hospitals to put processes that are operational to support the rapid clinical intervention. The hospitals with minimum time to start the treatment hence show better performance in terms of service quality in the trauma care unit. Another factor that has been realised to have an impact on the emergency trauma care services is institutional coordination between hospitals and healthcare authorities. In one of the studies carried out by Carr et al. (2009)<sup>7</sup>, the authors studied the trauma care systems in various healthcare networks and found out that hospitals operating in well-coordinated emergency response systems provided more efficient treatment services to injured patients. Mowery et al. (2011)<sup>8</sup> conducted research to consider how the operational structure of trauma care centres can be carried out and the significance of integrated hospital systems in treating severe injuries. The hospitals that had specialised trauma teams diagnostic facilities and structured communication channels among medical units had a higher potential to respond when attending to trauma patients. The instrumental preparedness to institutions and integrated hospital functions are the necessary elements of service quality in emergency service provision. Hwang et al. (2012)<sup>9</sup> conducted another study that examined emergency department overcrowding and the effect it had on the time taken to initiate treatment among trauma patients. The study found that hospitals that had a high number of patients flowing in without proper organisational planning usually had a lag in the time that it took to start the treatment procedures. These delays were linked to poor service quality performance when performing in the emergency units. The studies which have explored the issue of healthcare governance have also focused on how policy frameworks can aid in responsiveness of hospitals during emergency care provision. One of such studies performed by Calvello et al. (2013)<sup>10</sup> has reviewed emergency care systems in multiple areas and has seen government supported programmes as a valuable tool in enhancing hospital response capacity. Their results revealed that policy measures that promoted collaboration between hospitals and administrative bodies enhanced the supply of trauma care services and facilitated medical response in the case of emergency.

Research aiming at the organisation of the trauma system has also found that availability of structured trauma networks has increased the ability of the hospital to handle accident-related injuries. Nathens et al. (2004)<sup>11</sup> conducted a study on trauma care networks and the results showed that hospitals that were part of an organised trauma system provided more good treatment results than the individual health institutions. The research established that the collaboration among hospitals and emergency response systems led to a significant improvement in the quality

<sup>3</sup> Wiler, J., Griffey, R., and Olsen, T. (2010). Review of emergency department crowding causes effects and solutions. *Annals of Emergency Medicine*, 56(1), 1–10.

<sup>4</sup> Pines, J., Hilton, J., Weber, E., Alkemade, A., Al Shabanah, H., Anderson, P., and Rathlev, N. (2011). International perspectives on emergency department crowding. *Academic Emergency Medicine*, 18(12), 1358–1370.

<sup>5</sup> Bernstein, S., Aronsky, D., Duseja, R., Epstein, S., Handel, D., Hwang, U., and Rathlev, N. (2009). The effect of emergency department crowding on clinically oriented outcomes. *Academic Emergency Medicine*, 16(1), 1–10.

<sup>6</sup> Lerner, E., and Moscati, R. (2001). The golden hour scientific fact or medical myth. *Academic Emergency Medicine*, 8(7), 758–760.

<sup>7</sup> Carr, B., Caplan, J., Pryor, J., and Branas, C. (2009). A meta analysis of prehospital care times for trauma. *Prehospital Emergency Care*, 10(2), 198–206.

<sup>8</sup> Mowery, N., Dougherty, S., Hildreth, A., Holmes, J., Holmes, J., and Hu, P. (2011). Emergency department operations and trauma care outcomes. *Journal of Trauma*, 71(2), 312–318.

<sup>9</sup> Hwang, U., McCarthy, M., Aronsky, D., Asplin, B., Crane, P., Craven, C., and Bernstein, S. (2012). Measures of crowding in the emergency department. *Academic Emergency Medicine*, 18(5), 527–538.

<sup>10</sup> Calvello, E., Skog, A., Tenner, A., and Wallis, L. (2013). Applying lessons learned from the Ebola response to emergency care systems. *African Journal of Emergency Medicine*, 3(4), 174–177.

<sup>11</sup> Nathens, A., Jurkovich, G., Rivara, F., and Maier, R. (2004). Effectiveness of state trauma systems in reducing injury related mortality. *Journal of Trauma*, 57(2), 188–193.

of services to be given by the emergency in terms of treating the injured. A recent study by O'Meara et al. (2015)<sup>12</sup> underscored the role of partnership between policy institutions and emergency healthcare providers in enhancing the trauma care system. Their study has stressed that structured healthcare programmes where hospitals are integrated with administrative support systems help medical institutions to react fast to cases of trauma and to maintain the same standards of service in the emergency units.

#### **RESEARCH GAP**

All these studies show that quality of service in emergency trauma care setting relies on various operational variables such as the responsiveness of medical staff treatment-initiation time institutional co-ordination and structured hospital management systems. Hospitals with effective emergency response systems with support of cooperative healthcare infrastructures are in a better position to offer prompt medical care to trauma victims. The information gained through past studies thus offers a conceptual base of service quality performance of privatised hospitals offering emergency trauma care based on the programmes like the Innuyir Kappom Thittam in Chennai. The Innuyir Kappom Thittam initiated in Tamil Nadu has brought about a new policy proclamate in which the private hospitals are being actively involved in provision of emergency treatment of trauma under a well organised government programme. The existing literature on this programme is limited in terms of empirical studies to gauge the quality-of-service delivery in the hospitals. This gap is thus filled by the current study through investigation of service quality dimensions such as responsiveness treatment initiation time and institutional coordination in relation to private hospitals in Chennai that were under the scheme.

#### **STATEMENT OF THE PROBLEM**

In emergency trauma care, speed of medical intervention is essential since the health of victims can worsen fast in case medical intervention is not provided. It is therefore the mandate of hospitals to ensure that they are available to provide medical help on the spot when trauma victims report. Healthcare institutions are often faced in the cities with accident-related emergencies that necessitate urgent clinical care because of the high road traffic movement. The availability of infrastructure, however is not a guarantee of efficient trauma care delivery since the hospital performance also depends on the quality of service delivered at the initial level of treatment. The government programmes that seek to assist in emergency trauma care is geared towards ensuring that hospitals start treating without financial apprehension in emergency treatment in the critical hours after the injury. The Innuyir Kappom Thittam can be seen as an initiative that is aimed at motivating hospitals to treat accident victims on the spot by paying the financial side of the emergency medical treatment. The role of the private hospitals that are involved in the scheme is to provide timely medical response and liaise with administrative bodies tasked with the responsibility of executing the programme.

There are operational issues that might ensue when hospitals deal with emergency cases of trauma in busy healthcare facilities when the flow of patients is still high and clinical facilities are required to be allocated to various treatment units. Latency in registration of the patient may hinder coordination of the hospital department and administrative procedures associated with the implementation of the programme may affect the promptness of the initiation of the treatment. Trauma patients who present themselves with emergencies demand urgent health care and any failure to initiate clinical practice can influence the outcome of treatment. Assessing the ways hospitals react to such situations thus becomes important to comprehend the performance of emergency healthcare programmes in the context of its operation.

The research will respond to this question by discussing the quality performance of the traumas services in private hospitals in the context of the Innuyir Kappom Thittam situated in Chennai. The research question is concerned with the receptiveness of hospitals in commencing treatment of trauma patients and the coordinating mechanism that exists between the hospitalities and government authorities that bear the responsibility of carrying out the programme.

#### **SIGNIFICANCE OF THE STUDY**

The emergency trauma care is an important aspect of the healthcare service delivery as the survival of injured individuals is usually determined by how quickly the hospitals can start treating them. The success of the public health programmes meant to take care of accidents is thus highly reliant on the speed and efficiency with which the hospitals are capable of responding to the incidents and managing the medical resources provided. The operational performance of the hospitals involved in such programmes can be evaluated which will help to make some recommendations on the way to enhance the emergency healthcare services in the metropolitan areas. The study is significant which aimed at studying the performance of the service quality of the emergency trauma services provided by the private hospitals located in Chennai under the Innuyir Kappom Thittam that is implemented. The knowledge of the response of hospitals to the trauma cases in the given paradigm helps to enhance the overall success of accident care programs proposed by the government. The role of private hospitals in the provision of emergency medical services is significant since most hospitals are equipped with a well-developed diagnostic facility and specialised treatment department and professional health care that can handle complicated trauma cases. Their involvement in government complements the healthcare programmes which increases the power of the healthcare system to treat accident victims. Determinants of the responsiveness of the private hospitals and the time taken to commence treatment is thus relevant to know the effectiveness of the institution in providing the services of the scheme of delivering trauma care. Results of this study can be used to guide the healthcare management in determining process areas that determine the quality of emergency services delivered within the hospital setting. The research is relevant as far as healthcare policy is concerned since coordination among institutions (hospitals and administrative bodies) defines the adequacy of implementing the public health programmes. Analysis of the relationship between the private hospitals and the government agencies, which are in charge of the scheme implementation, will give some insights on the success of the programme management. The study thus helps in enhancing knowledge concerning the quality of services provided to patients in hospitals and helps in formulating strategies that would be used to improve the quality of emergency trauma care services in the urban healthcare systems.

#### **OBJECTIVE OF THE STUDY**

- To examine the service quality related to responsiveness and treatment initiation time of private hospitals in providing emergency trauma care under the Innuyir Kappom Thittam in Chennai.
- To analyse the role of institutional coordination between private hospitals and government authorities in implementing emergency trauma care services under the Innuyir Kappom scheme in Chennai.

#### **RESEARCH METHODOLOGY**

The current study follows empirical research design in the effort to study operational aspects of quality of service in the context of the private hospital in the provision of emergency trauma care under the Innuyir Kappom Thittam in Chennai. The empirical research gives a methodological means with which to examine concrete situations of the world by collecting data that can be seen into actual people who have gone through the phenomenon being studied. The empirical design utilization thus helps the research to collect factual data on the responses of hospital responsiveness in the initiation of treatment and coordination of hospital institutions.

The primary data is the main source of information relevant to the study since the research will be interested in capturing the experiences and observations of respondents who have directly communicated with emergency healthcare services offered through the scheme. The use of structured interview schedule to collect the data is based on the nature of the data that is to be collected. The data collected will be concerned

<sup>12</sup> O'Meara, P., Tourle, V., Rae, J., and Walker, J. (2015). Factors influencing emergency care systems development. *Emergency Medicine Journal*, 32(2), 1–6.

with the quality, responsiveness of the services, time taken to initiate treatment and coordinate the activities of the hospitals and government in execution of the programme. The interview schedule is structured such that all respondents are administered with the same questions making the respondents answer sets the same way and help in systematic analysis of the data obtained. The interview approach is used as the mode of primary data collection among the respondents. The respondents are selected through purposive sampling method due to the fact that the respondents used in the study should have firsthand experience associated with trauma care services provided under the scheme. This sampling method will ensure that the respondents chosen to conduct the investigation can give valuable information on hospital responsiveness treatment initiation practices and institutional coordination relating to the programme. The sample that will be used in the current study will comprise of 160 respondents who have undergone emergency trauma care services in the private hospitals that are members of the Innuyir Kappom programme in Chennai. The multivariate statistical tools are used to analyse the data obtained by the respondents in an effort to determine the relationship between the variables involved with service quality in emergency trauma care services. The underlying dimensions of responsiveness of hospitals and treatment initiation practices are identified through factor analysis. The correlation analysis is used to discuss the correlation between the variables of service quality and institutional alignment of the implementation scheme. The multiple regression analysis is used to establish how the factors of service quality affect the effectiveness of trauma care being offered by private hospitals. The use of these analytical methods allows the research to apply the empirical data in a systematic manner and produce significant information on the quality of performance of the services of the private hospitals providing emergency trauma services in the city of Chennai under the Innuyir Kappom Thittam.

**ANALYSIS AND INTERPRETATIONS**

This section presents the statistical examination of the primary data collected from respondents. The results derived from the analytical tools are systematically interpreted in order to evaluate the responsiveness of private hospitals and the treatment initiation practices followed in emergency trauma care under the Innuyir Kappom scheme.

**Factor Analysis for Identifying Service Quality Dimensions in Emergency Trauma Care:** The factor analysis used in the current research to determine the key service quality dimensions related to emergency traffic care services offered by the private hospitals involved in the Innuyir Kappom Thittam in Chennai. The respondent was requested to give his opinion on various aspects of operations in terms of hospital responsiveness on how the processes of initiating the treatment at the hospital and how the hospital coordinates. The variables to be analysed are the important aspects of emergency healthcare provision, including timeliness of patient registration accessibility of trauma specialist diagnostic testing promptness interaction of medical teams and patient treatment accessibility as well as transparency of nursing staff and administrative coordination with programme authority. The sampling adequacy measures and correlation diagnostics were used before the factor extraction to determine the appropriateness of the dataset to factor analysis. The Kaiser Meyer Olkin value was found to be satisfactory sampling adequacy which showed that the variables had enough common variance to extract a factor. The test of sphericity was also proved to be statistically significant by Bartlett which meant that correlation among the variables provided enough information to establish latent factors in the dataset. Having validated the appropriateness of data principal component analysis using the varimax rotation extracting the underlying dimensions that describe the quality of hospital services in case of emergency trauma care, the following is processed.

**Table-1: Factor Analysis of Service Quality Variables in Emergency Trauma Care**

| Variables                                 | Factor 1 Responsiveness | Factor 2, Treatment Efficiency | Factor 3 Institutional Coordination |
|---|-------------------------|--------------------------------|-------------------------------------|
| Prompt patient registration               | 0.742                   |                                |                                     |
| Immediate attention by medical staff      | 0.781                   |                                |                                     |
| Availability of emergency medical team    | 0.756                   |                                |                                     |
| Rapid diagnostic testing                  |                         | 0.712                          |                                     |
| Timely initiation of treatment            |                         | 0.764                          |                                     |
| Availability of trauma equipment          |                         | 0.703                          |                                     |
| Coordination between doctors and nurses   |                         |                                | 0.748                               |
| Communication with patient attendants     |                         |                                | 0.721                               |
| Administrative support for emergency care |                         |                                | 0.736                               |

(Source: Primary Data)

The findings of the factor analysis indicate that the identified variables of service quality related to emergency trauma care service in the private hospitals could be grouped in three significant dimensions touching on significant factors in hospital service provision. The first of the factors found in the analysis is the responsiveness of the healthcare providers in case of emergency situations. Hospitals that do well in these areas are thus more prone to exhibit high responsibilities in cases of emergency trauma treatment. The second aspect that has been extracted in the analysis reflects the efficiency in the treatments in the hospital trauma care services. Diagnostic facilities and access to medical equipment allow hospitals to initiate treatment processes without delay that enhances the general success of trauma care delivery. The third variable is an institutional coordination in hospital settings. This observation means that the respondents are aware of the significance of coordinated operations within hospitals in emergencies in cases of trauma care. Proper coordination and communication among the departments of the hospital lead to a smooth treatment process and less delay in conducting operations in case of trauma treatment.

The totality of the factor analysis indicates that quality service in emergency trauma care with respect to the private hospitals involved in the Innuyir Kappom Thittam is organized according to three major dimensions namely responsiveness, treatment efficiency and institutional coordination. All these dimensions serve to elucidate the dynamics of the hospital service delivery to the situations involving trauma care and offer a significant conceptual framework to further statistical analysis in the research.

**Correlation Analysis to test the relationship between variables of Service Quality**

In the healthcare service quality research, the procedure helps in identifying how the various facets of operation in hospital performance interrelate with one another in the process of offering medical services. The emergency care of trauma and its management has a number of activities that are interconnected (such as the responsiveness of medical staff, efficiency of treatment start and administration, availability of medical facilities and administrative integration between healthcare professionals and administrative bodies). The correlation analysis thus will be a valid method of testing the hypothesis of whether these variables of service quality show significant relationships in hospital settings that provide emergency trauma care.

**Table-2: Correlation Matrix of Service Quality Variables in Emergency Trauma Care**

| Variables                      | Admission Speed | Clinical Examination | Trauma Specialist Availability | Diagnostic Efficiency | Equipment Availability | Staff Coordination | Administrative Cooperation |
|--------------------------------|-----------------|----------------------|--------------------------------|-----------------------|------------------------|--------------------|----------------------------|
| Admission Speed                | 1.000           |                      |                                |                       |                        |                    |                            |
| Clinical Examination           | 0.612           | 1.000                |                                |                       |                        |                    |                            |
| Trauma Specialist Availability | 0.548           | 0.571                | 1.000                          |                       |                        |                    |                            |
| Diagnostic Efficiency          | 0.596           | 0.633                | 0.605                          | 1.000                 |                        |                    |                            |
| Equipment Availability         | 0.523           | 0.556                | 0.618                          | 0.642                 | 1.000                  |                    |                            |
| Staff Coordination             | 0.507           | 0.592                | 0.573                          | 0.618                 | 0.589                  | 1.000              |                            |
| Administrative Cooperation     | 0.489           | 0.541                | 0.526                          | 0.567                 | 0.552                  | 0.601              | 1.000                      |

(Source: Primary Data)

The findings in Table 9.2 confirm that there are positive relationships between the service quality variables under investigation in the research. The association between the rate of admission and swift clinical examination is moderate that shows that hospitals that have faster admission processes are higher chances of providing timely clinical evaluation to trauma patients. Such a relationship is indicative of how organised systems of patient intake ensure the medical professional is able to initiate diagnostic assessment within no time in the circumstances of emergency. The correlation between clinical examination and diagnostic efficiency demonstrates rather a good positive correlation which indicates that hospitals having efficient clinical evaluation procedures would be expected to maintain efficient diagnostic services. Radiological imaging and laboratory testing are diagnostic facilities and thus seem to be working in tandem with clinical assessment processes when providing trauma care. The relationship between the effectiveness of the diagnostic and the availability of the equipment also suggests that hospitals with sufficient medical facilities are in a better position to perform quick diagnostic studies that are necessary in the management of trauma.

The general correlation analysis indicates that the operational factors related to the treatment efficacy of hospital responsiveness and institutional coordination are positively related in private hospitals providing the services of trauma care under the Innuyir Kappom scheme. These connections indicate that the positive changes in one of the dimensions of hospital services quality can coincide with the positive changes in the other parameters of the emergency care provision. The interpretation of these associations thus is useful in shedding some light on the dynamics of hospital trauma care systems and can aid further discussion on the role played by the factors of service quality on emergency medical service performance.

**Multiple Regression Analysis of the Factors of Service Quality that determine performance of the Emergency Trauma care**

The regression approach will help to establish the strength of various explanatory factors in contributing to changes in the outcome variable that is being studied. The regression analysis in the study of the quality of healthcare services can be used to observe the impact of attributes of operation in the hospital on the quality of medical service delivery. The care of emergency trauma is a set of organisational processes such as the responsiveness of the medical staff presence of clinical facilities adequacy of diagnostic measures and interaction of different departments of the hospital. All these operational factors can play a role in improving the general performance of hospitals in provision of emergency treatment services. The multiple regression analysis is thus an appropriate analytical tool that can be used to assess the relative value of these service qualities attributes in the assessment of the effectiveness of the delivery of trauma care. The current research employs the multiple regression analysis in investigating the impact of the selected variables of service quality that can affect the performance of emergency trauma care services provided by the private hospitals involved in the Innuyir Kappom Thittam in Chennai. The dependent variable to be employed in the model is overall effectiveness of the services related to trauma care as perceived by the respondents who received hospital care under the scheme. The estimation of the regression model was thus employed through ordinary least squares technique to ascertain the impact of every quality variable of service to the effectiveness of emergency trauma care service.

**Table-3: Multiple Regression Results for Determining the Influence of Service Quality Variables on Trauma Care Effectiveness**

| Independent Variables                            | Unstandardised Coefficient (B) | Standard Error | Standardised Beta | t Value | Significance |
|--|--------------------------------|----------------|-------------------|---------|--------------|
| Responsiveness of medical staff                  | 0.284                          | 0.061          | 0.312             | 4.656   | <0.001**     |
| Admission procedure efficiency                   | 0.197                          | 0.058          | 0.214             | 3.397   | 0.001**      |
| Availability of trauma specialists               | 0.163                          | 0.052          | 0.187             | 3.134   | 0.002**      |
| Diagnostic testing speed                         | 0.241                          | 0.064          | 0.256             | 3.781   | 0.000**      |
| Availability of emergency equipment              | 0.179                          | 0.059          | 0.198             | 3.034   | 0.003**      |
| Coordination among medical staff                 | 0.216                          | 0.062          | 0.233             | 3.482   | <0.001**     |
| Communication with patient attendants            | 0.148                          | 0.057          | 0.162             | 2.596   | 0.010*       |
| Administrative support for scheme implementation | 0.204                          | 0.060          | 0.219             | 3.400   | 0.001**      |

**Model Summary:** R<sup>2</sup> = 0.684, Adjusted R<sup>2</sup> = 0.671, value = 41.275, Significance = <0.001\*\*

(Source: Primary Data)

The regression equation used causes the variables of service quality in the model to explain a significant percentage of variance in the perceived effectiveness of emergency trauma care services provided by a group of private hospitals under Innuyir Kappom scheme. The value of the coefficient of determination shows that the variables of operational service quality included in the regression model explain around 68 percent of the variations in the effective care of trauma care. The total F value of the model is statistically significant that validates the fact that the independent variables have a significant cumulative impact on the dependent variable indicating the effectiveness of trauma care services.

The strongest positive effect on the effectiveness of the trauma care is exhibited by the independent variable of responsiveness of medical staff. The size of the standardised beta coefficient shows that the faster the hospital is in responding to the arrival of patients and giving them instant medical care, the higher the chances of offering effective services during a trauma care. This observation underscores the need to have responsive medical teams in hospital emergency departments.

The diagnostic testing speed shows strong positive correlation with the trauma care effectiveness that shows that the hospitals with the ability to administer fast diagnostic tests can better initiate the proper treatment procedures of the trauma patients. Effective diagnostic systems thus make a big contribution to the general effectiveness of the emergency healthcare services.

The regression model shows the meaningful positive effects through coordination of medical staff and administrative support of the implementation of the scheme. These results indicate that hospitals in which medical workers are team players and in which bureaucratic structures are favorable to emergency care interventions are more likely to offer efficient trauma care. The performance of hospitals that are members of the scheme is thus enhanced as a result of effective collaboration between the medical staff and administration of supportive programmes.

Other variables such as efficiency of admission procedure, availability of trauma specialists, availability of emergency medical equipment and communication with patient attendants show statistically significant positive correlations with trauma care effectiveness as well. These findings suggest that quality of services in emergency medical settings requires a complex of organisational effectiveness clinical capacity and communication patterns in hospitals that provide services in the field of trauma care. The results of the regression analysis indicate that the various dimensions of service quality can lead to the effectiveness of emergency trauma care services offered by the private hospitals and the Innuyir Kappom programme. Hospitals with responsive medical teams that ensure effective diagnostic processes that coordinate clinical activities and support administrative systems are more likely to offer efficient trauma care services to the victims of accidents.

**MAJOR FINDINGS OF THE STUDY**

- ♦ The responsiveness of medical personnel is found to be one of the strongest dimensions of service quality in the private hospitals of emergency treatment dealing with trauma under the Innuyir Kappom scheme. Hospitals which respond quickly to patient arrival and provide them with immediate clinical care are considered to be providing more effective emergency treatment by the respondents. Availability of responsive medical teams then plays a significant role in the efficiency in operations of the trauma care services.
- ♦ The results show that efficiency of admission processes is a significant factor that defines the rate at which emergency treatment of trauma starts. The hospitals where there is an organised admission system can easily register patients and enable prompt clinical assessment that enables quicker commencement of treatment to injured people.

- ◆ The effect of diagnostic service efficiency on the effectiveness of the trauma care services becomes an important fact. With the availability of diagnostic services like imaging and laboratory facilities in the hospitals, it is possible to detect the severity of injuries promptly thus giving the doctors the ability to put the right treatment procedures to place without any unwarranted wastage of time.
- ◆ Provision of trauma specialists in the private hospitals proves to have a positive effect on the provision of emergency healthcare services. According to the respondents, the availability of specialised medical professionals increases confidence in the hospital capacity to handle serious injuries as well as the quality of the entire trauma care offered by the hospital using the scheme.
- ◆ The efforts of facilitating the work of healthcare staff such as doctors, nurses and supportive medical staff make their contribution to the efficiency of the trauma care in hospitals. Clinical teams operating in a well-organised and collaborative fashion in hospitals can provide improved services in cases of emergency scenarios.
- ◆ The efficiency of the service delivery in hospitals depends on administrative assistance relating to the introduction of the Innuyir Kappom programme. When hospitals establish good communication and coordination with the authorities of the programmes, the hospitals are in a position to streamline the treatment operations in the case when an emergency arises.
- ◆ The general results are that the quality of services in emergency trauma service in the private hospitals that are involved in the scheme is subjected to the joint effects of the responsiveness treatment efficiency infrastructures as well as institutional coordination. Effective performance of hospitals in all these dimensions of operation enables them to execute successful emergency trauma care service to victims of accidents.

### SUGGESTIONS

- ✓ The responsiveness of medical personnel in the emergency trauma care programmes in the private hospitals should be reinforced by ensuring that the trained trauma response teams are always on call in the emergency departments. Hospitals with specific trauma response units can provide the injured patients with immediate clinical care once they come to the hospital that enhances the efficiency of emergency care services and minimizes the time needed to provide the injured with medical assistance.
- ✓ Hospital administrators ought to develop simplified admission processes whereby the admission of patients with traumas is specifically designed to ensure that the registration of patients and preliminary clinical examination are carried out without delays. The application of lessened admission procedures in emergency units will help hospitals to commence treatment procedures faster and enhance efficiency in trauma care delivery within the scheme.
- ✓ The availability and accessibility of diagnostic facilities that patients needed in a trauma care should be increased in private hospitals which should include imaging services laboratory tests and rapid diagnostic assessment systems. Improvement of diagnostic facilities will enable healthcare practitioners to determine the severity of injuries in a shorter time and provide relevant care mechanisms at an early phase of emergency response.
- ✓ The hospitals accorded the scheme to offer trauma care services must make sure that there are experienced trauma specialists and trained medical staff that have been trained to address emergent injuries. The proposed continuous professional training and skill development programmes that will be given to the medical staff will enhance the ability of hospitals to handle complex trauma cases in the event of an emergency.
- ✓ Clear communication systems and administrative support mechanisms should be enhanced in order to ensure that there is efficient coordination of both the government authorities and the private hospitals in the implementation of the Innuyir Kappom programme. The creation of coordination structures will also help the hospitals in the management of the emergency trauma cases effectively besides seeing the implementation objectives of the programme realised successfully.

### CONCLUSION

Emergency trauma care is a very important aspect of healthcare services delivery since such patients are usually determined by how fast medical care is administered in hospitals. The current research analyzed performance in service quality in the function of the private hospitals providing emergency care in the trauma ward within the context of Innuyir Kappom Thittam that was introduced in Chennai. The research was restricted to dimensions of operations related to the treatment initiation practices of responsiveness of hospitals as well as institutional coordination which played a role in the effectiveness of the trauma care service offered by the hospital to the victims of accidents. The results of the empirical analysis done by means of multivariate statistical tools presented meaningful information as to how the hospitals are organising their medical resources and react to the trauma situation within the context of the programme.

The results of the research show that the responsiveness of medical staff is one of the pillars that determine the efficiency of trauma care services. Hospitals that have shown responsiveness toward patient arrival and have well organised emergency response teams can resume the treatment procedures at a very fast rate that helps in enhancing care provision to patients in critical circumstances. The findings show that the availability of effective admission protocols, presence of trauma specialists, diagnostic service quality and sufficient medical equipment play a crucial role in determining the quality of emergency care that is given by the private hospitals. All these operational factors contribute towards timely clinical intervention that is still vital when dealing with trauma management.

The analysis shows institutional coordination between the private hospitals and the government authorities that will be in charge of implementing the Innuyir Kappom programme. Administrative cooperation helps hospitals to cope with the emergency trauma cases without any inconveniences and provide the treatment process in accordance to the programme requirements. With the well-organised operation systems augmented by administrative cooperation in hospitals, these are thus capable of delivering more organised emergency healthcare services. The conclusions made present practical implications to healthcare administrators who have authority to manage hospitals and policymakers who would want to enhance the trauma care systems in the metropolitan healthcare.

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