

Leadership Challenges to Attaining Hospital Accreditation: An Indian Perspective on Managing Healthcare Quality

Ajayan Kamalasanan¹, Gurumoorthy Sathiyamoorthi², Arun Vijay Subbarayalu³

Abstract: Aim: To study the role played by the leaders and the challenges faced by them to build and sustain quality standards in order to attain accreditation of the hospitals in India. **Method:** The study is based on the exploration of challenges encountered by the leaders to accomplish the quality standards of hospitals in order to meet the target of various national and international accreditations. The research carried out a detailed analysis of literature on various challenges faced by the leadership in managing quality to attain hospital accreditation. **Results:** The potential challenges were identified as inadequate infrastructural facilities, financial constraints, compliance with all regulatory and professional requirements, insufficient human resources, lack of training, complexities in the documentation, and adoption of information technology are identified as the major challenges faced by the healthcare leadership in managing quality & accreditation of Indian Hospitals. **Conclusion:** The study enlightens the challenges faced by the leadership in various aspects of quality management to attain accreditation of hospitals in India. The study identified 12 major challenges and provides appropriate strategies to be developed and addressed by the leadership for handling the different aspects of quality management in healthcare settings. Since this study is based on the review of literature, further research is warranted to ascertain the effectiveness of suitable measures to overcome these challenges in improving the quality of healthcare.

Key Words: Leadership, India, Quality of Health Care, Quality Improvement, Hospital Accreditation

1 INTRODUCTION

Quality management, patient care, and patient safety are getting added attention among the healthcare administration and other stakeholders of hospitals across the globe. As part of the healthcare transition, the modern healthcare system, and the leaders who are behind the wheels are looking ahead to attain high-quality services in all aspects of hospital management. All the achievements made over the period, through tiresome efforts must sustain with continuous quality improvement. The several decades of efforts laid down by the leaders facilitated the system to improve the offered services and its quality with steps made in the accomplishment of better staff patterns, infrastructure, and clinical settings. This progressive development should achieve through continuous quality improvement, regular internal review, followed by an external audit by reputed accreditation agencies, either national or international. While striving to achieve the target, the leadership comes across several challenges. In the process of accreditation, the different challenges faced by the higher administration which interferes with the quality of care, particularly in the private sector are the lack of monitoring by statutory authorities; obsolete and inadequate legislation; and the inability or failure of the government to impose existing regulations [1].

Accreditation is principally an outline which aids healthcare organizations to launch objective systems aimed at patient safety and quality, which is considered noteworthy in transforming the healthcare sector (Rahat, 2017). According to the National Accreditation Board for Hospitals & Healthcare Providers (NABH) accreditation is a public acknowledgement for the achievement of accreditation standards by a healthcare institution, which is illustrated by external independent peer reviews of the institution's performance concerning the quality standards [3]. This endorsement appeals to the healthcare facilities as it can afford external validation of quality in a setting, where the overall medical care is known to be highly variable [4]. Committed leadership is inevitable to attain accreditation, who are ready to face the potential challenges. Leadership is demarcated as the behaviour of an individual or the leader, directing the activities of a group towards a shared goal [5]. The role played by the leadership is to get things done by organizing the workforce to attain the common shared goal [6]. According to Cohen [7], leadership is the art of persuading others to achieve the maximum output to accomplish any mission or objective. Further, the key features of the leader are to influence group activities to cope up with the change and potential challenges which they face while sailing through the process [8]. When they meet the target, the impact of such certification is profound, where it improves risk management and risk reduction, aids the strengthening of patient safety efforts, and creates a patient safety culture [9]. The advantages of attaining accreditation by facing the administrative challenges are not limited to quality improvement, but it gains the confidence of the community where it serves. Managing the resources wisely, including the workforce, which is already on workload, is yet another challenge the higher administration of the hospital should face. The leadership has to explore and exploit the diversity within the institution and use resources proficiently during the management processes and at the same time, inspire the employees to work towards the common goal of accreditation [10]. The role of leadership in this venture is known to the

- Ajayan Kamalasanan¹, Gurumoorthy Sathiyamoorthi², Arun Vijay Subbarayalu³
- 1. Research Scholar-PhD, Department of Business Administration, Annamalai University, India
- 1. Lecturer, Measurements & Evaluation Department, Deanship of Quality & Academic Accreditation, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia
- 2. Associate Professor, Department of Business Administration, Annamalai University, Tamil Nadu, India
- 3. Assistant Professor, Measurements & Evaluation Department, Deanship of Quality & Academic Accreditation, Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia

accreditation agencies and thus the Joint Commission International (JCI) standards, which addressed the leadership pyramid in the healthcare organization comprising of the governing body, the chief executive, and the leadership [11]. Quality and accreditation in India are still in the childhood stages, where the majority of the hospitals are striving hard to improve quality to meet the standards set by the accreditation agencies. Among the thousands of multi and super-speciality hospitals, only 130 hospitals accredited until the date of this study [12]. Many more hospitals may be in the process of developing quality and patient safety to maintain continuous quality assurance to attain accreditation. However, the level of challenges with varied intensity may likely arise while sailing through the accreditation standards at the time of conducting a self-assessment. Hence, before kick-starting the accreditation process, the healthcare organization should be well aware of the potential challenges which they have to pass through during their accreditation journey. The study thus explores the competitive situation of the leaders who manage the Indian hospitals. The analysis and conclusion of the study may also help them to manage their multifaceted system and human resource to progress towards accreditation.

2. LITERATURE

The study reviewed the literature on different functional areas of the accreditation process, which includes the challenges faced by the leadership in various areas of quality management and accreditation in the Indian healthcare settings. The challenges comprises of issues related with legal matters and governance, financial implications, organizational culture of the institution, involvement and obligation of the leadership towards accreditation, the administrative and managerial matters, human resource management, training and development, infrastructure, documentation and archiving, data management, medication and pharmacy management, research and continuous medical education and finally, the community contribution and relationships.

2.1 Legal Matters and Governance

The Joint Commission International, working towards accreditation of hospitals and other healthcare institutions, clarifies that the hospitals should have a well-set governance system with provisions for legal authority and responsibility for patient safety and patient care with utmost quality [13]. Further, the Indian accreditation agency, the NABH, also encourages the best practice of having good governance of the hospital professionally and ethically. Furthermore, the responsibilities of the management are well defined, and it clarifies the best practices of handling potential medico-legal cases. NABH also stated that for complying with its standards, the healthcare organization should have a process-driven approach in all aspects of its operations – from the display of services, registration, admission, preoperative, perioperative period, and postoperative protocols, discharge from the hospital till follow-up with the hospital after discharge. The standards not only cover clinical aspects, but it also addresses the governance of hospitals, based on clear and transparent policies and protocols. Through these procedures, NABH rationalizes the entire operations of a hospital [14]. The leadership's challenge is to comply with all the policies and regulations set by NABH and guide the healthcare team to adhere to the standards and establish systems accordingly, which needs effort and time of the headship. Fischer et al. [15]

pointed out that an inclusive leadership can help to develop competency and performance of employees by providing clinical and technological support by applying quality enhancement philosophy and coherence of workforce.

2.2 Financial Matters

The financial issues are one among the paramount concerns of hospital management, which build up as a barrier in front of the leaders while setting up systems to comply with the NABH standards. This concern is not limited to the cost of continuous quality management, but the cost of certification and its related expenses incurred from the registration fees, training, consultation fees and expenses of other administrative functions. Lack of sufficient finance is always an obstacle for quality management and the implementation of quality systems [16]. Even though there are studies on challenges faced by the leaders, most of their conclusion did not report intervention context and cost implications. This may be a reason for not assessing the challenges of complex heterogeneous interventions like accreditation and official recognition [17]. A review stated that the incremental costs to carryout healthcare accreditation standards vary from 0.2% to 1.7% of operating expenses when averaged across the accreditation process [18]. According to a study, the biggest obstacle to introducing accreditation in poorly resourced settings, like India, is how to finance the process [19]. However, the government of India is encouraging the hospitals to have quality and patient safety measures by offering them with more funds for providing treatment under the newly announced comprehensive health insurance scheme, 'the Modicare'. If they overcome the financial challenges of accreditation, the Insurance Regulatory Development Authority (IRDA) has issued a notification for the health entities to consider NABH entry-level accreditation for availing reimbursement benefits from the insurance providers [20].

2.3 Organizational Culture

Work culture is related to the institution's vision, mission, values, norms, followed systems in the organization, beliefs, and habits followed [21]. The working environment, by and large, persuades the workforce, and it inturns, psychologically manipulates the employees, leading to motivation to achieve the common goal [22], [23]. To be precise, the organizational culture is "the way things are done around here" [24]. The working environment and the work culture is moulded by the leaders who welcome their responsibility in sustaining and developing an institution's work culture. The behavioural framework ensures job satisfaction when a staff member feels that his/her leader supports them to meet the common goal [25]. This clarifies the inextricable association between the leader and the organizational culture. However, a hospital's organizational civilization may differ from the culture perceived in other institutions, as the hospital atmosphere consists of a complex jumble of professional and non-professional employees [26]. The organizational culture in a hospital is observed based on the higher administration's commitment and the dedication of the employees. The leaders play a significant role by appreciating their function to sustain the culture as organizational culture is positively correlated with leadership behaviour in a hospital setting [27]. In a hospital environment, the organizational culture is illuminated by group cohesiveness, coordination between the higher administration and employees, to be precise the teamwork [28]. A study on

organizational values of primary health centres in India illustrates that openness among the leaders and the staff as the most critical perceived value, followed by confrontation and trust, while autonomy and collaboration were the least appreciated and practised values [29]. The process involved in the accreditation cycle helps the organization to develop an acceptable working culture, ethical leadership, patient safety, and continuous quality improvement [30].

2.4 Administrative and Managerial Issues

Lack of motivation and support from the leadership, deficiency in making prioritization for quality assurance and certifications, insufficient strategic plans, lack of commitment of leadership in monitoring the accreditation process, along with a malfunctioned administrative process are the significant factors which impede quality management process and accreditation of the hospital [31]. Further, the commitment of senior healthcare leaders, their knowledge and skills, the capability of identifying the areas which need improvement and prioritization of those areas for further improvement to meet the rigorous accreditation standards were the common challenges faced by the hospital leadership [32].

2.5 Human resource management

Human resource is a core element of health services and an essential component of the health system [33]. Failure to retain human resource for health may lead to higher healthcare cost and a further increase in out of pocket expenditure, increased time of service delivery, decrease in quality and coverage of service, increase in hiring and training cost and decrease in motivation to live in the organization [34]. Common challenges faced by hospital leaders include increased recruitment cost, retaining the most productive & talented employees by providing a better quality of work-life and, maintaining adequate workforce to avoid unnecessary interruption to patient care in Hospitals.

2.6 Training and development

Professional development is the key where healthcare leaders must take necessary steps to assess, develop, and fine-tune both personal & professional skills of their employees to remain proficient [35]. Common challenges on training & development initiatives taken at hospitals include identification of training needs of employees, training cost; managing employees' time to be allocated for training without affecting patient care.

2.7 Infrastructure

Infrastructural challenges are one among the prominent confronting factor affecting the quality of Indian Hospitals. Inadequate infrastructure is in the public health sector, as the delivery of services is hampered by several policies and management constraints [36]. In particular, issues such as insufficient staff, weak reference system, lack of accountability for the quality of care and, weak logistics management system poses a real challenge to the healthcare leaders [37].

2.8 Documentation and archiving

Registering the activities and record-keeping by the persons responsible is an integral component of the hospital setting, which cultivates quality and continuous care. A wide range of activities falls under this domain, which ranges from recording the time of medication, patient demographics, treatment

information, the temperature of refrigeration, communication of different disciplines, financial activities to continuous patient support. In spite of the vitality of this domain, documentation and archiving gets less attention in our hospital settings. Quite often, the records may contain erroneous entries, missing information, and frequent inconsistencies by the healthcare team [38]. Another study also reports this on the assessment of quality in clinical documentation, which concludes that the quality of documentation was critically intolerable [39]. Even the medical records considered as evidence in the court as per section three of the Indian evidence act, 1872, which is revised later in 1961 [40]. The continuous effort of public and private sector hospitals to improve the quality of data, quality of care, and finding an appropriate solution to the long-standing challenge should be an agenda of the leaders [41]. The commitment of the professionals with greater competence is vital for proper documentation, archiving and following up of the events and incidents are essential to comply with the standards of hospital accreditation, which helps the leaders to eliminate nonconformance and the workloads of the healthcare professionals [42].

2.9 Data management

One of the significant challenges faced by healthcare leadership is to gather the right data from various specialties of the hospital at a regular pace. In any healthcare setting, managing data and information should consider as a quality indicator of evidence-based healthcare quality and patient safety. It is quite common that the majority of hospitals in India allots a meagre budget for data generation and information technology. Innovative data management systems like the data-driven methods, if applied appropriately help the healthcare administration to guide the process of quality improvement of the hospital [43]. A study on the challenges of using big data analytics in India illustrates that the application of such systems in the healthcare settings help improve the quality of healthcare and reduce the healthcare cost while offering enhanced healthcare access to the invaluable human resources [44]. To facilitate the transition of data and information system from the current situation to meet the expectations of quality standards, both national and international, there is a need to revitalize the data and information technology [45].

2.10 Medication and pharmacy management

Some of the common challenges facing medication and pharmacy management in Indian hospitals are to reduce medication errors, optimize on-time dispensing of medicine, and employing/managing qualified pharmacists to offer high-quality service to patients' communities. A medical error occurs when a health care provider chooses an inappropriate method of care and is often described as human errors in health care [46]. Through the reduction of medication errors, problems such as adverse drug reactions, unnecessary hospitalization, disability or death, rework, increased waiting time of patients/attenders, legal issues, cost of patient care can reduce, which results in improving patient safety and frontline staff productivity [47].

2.11 Research and continuous medical education

Health services research produces knowledge about the performance of medical care systems, and policy analysis applies this knowledge in defining problems and evaluating

policy alternatives [48]. One of the most prominent challenges facing hospital leaders is to facilitate its skilled workforce to get involved in research and thus contributing to enhancing the quality of patient care services. However, it is observed that Continuing Medical Education (CME) opportunities are much limited in the developing world like India because of the lack of legal or other incentives [49]. Thus, healthcare leaders should focus on conducting periodic CMEs to update the skills of their workforce to maintain quality.

2.12 Community contribution and relationships

Ultimately all the efforts taken by the leadership are for the betterment of the community where it serves, and it is the social responsibility of the healthcare organization. Unfortunately, there is scarce information about community contributions of healthcare organizations in India. However, in India, it is a fact that many not-for-profit healthcare organizations are at the forefront of community service. A study on hospital's community contributions and profit illustrate that management of a hospital should be in concurrence with the leadership and policy planners, to arrive at a consensus on jointly acceptable standards on the degree of community contribution and services. It is proposed that the most accepted and unbiased standard is 'quartile comparisons' of the hospital's financial performance to the level of community contributions [50]. Hence, the leadership should address the challenge of reaching up to the community and establishing mutual relationships to achieve the goals of the hospital [51].

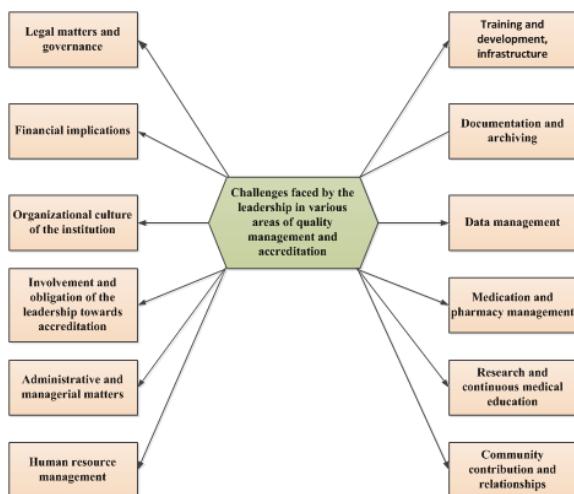


Figure 1: Constructs covered in the review of literature focusing on challenges faced by healthcare leadership in the areas of quality management and accreditation

3. CONCLUSION

Based on the findings of the study, the authors pointed out the significant challenges which hinder the leaders in their journey towards hospital accreditation. The challenges identified are:

1. Lack of sound governance with provisions for legal authority and responsibility
2. Disproportionate financial allocations
3. Inefficient work culture
4. Lack of committed leadership with unbalanced prioritization of areas which need improvement for quality assurance amidst insufficient strategic plans

5. Failure of management on the administration
6. Retention of the experienced and skilled human resource along with unexpected recruitment cost
7. Dearth of timely professional development and inadequate infrastructure
8. Inefficient archiving and follow-up system
9. Obsolete data and information system
10. Higher medication errors and higher dispensing time of medicine
11. Noncompliance of the medical fraternity for continuous research
12. The challenge of reaching up to the community to establish mutual relationships.

These challenges should be taken into consideration while improving the quality of healthcare services in Indian healthcare settings. This study also emphasized appropriate strategies to be adopted by the leaders to improve the quality of healthcare services in India. Further studies are warranted to ascertain the effectiveness of suitable measures to overcome these challenges in improving the quality of healthcare.

4 REFERENCES

- [1] Jesani A. Laws and health care providers. Mumbai, India: Centre for Enquiry into Health and Allied Themes. 1996.
- [2] Rahat N. "Healthcare accreditation in India-Key factors & challenges", paper presented to the Proceedings of International Conference 2017, TMIMT, Moradabad
- [3] NABH Accredited Hospitals, 2109; NABH website <https://www.nabh.co/firmViewAccreditedHosp.aspx> (accessed on 13 December 2019)
- [4] Cleveland, E.C., Dahn, B.T., Lincoln, T.M., Safer, M., Podesta, M. and Bradley, E. (2011), "Introducing health facility accreditation in Liberia", *Global Public Health*, Vol. 6 No. 3, pp. 271-282
- [5] Hemphill, J.K. and Coons, A.E. (1957), "Development of the leader behavior description questionnaire", in Stodgill, R.M. and Coons, A.E. (Eds), *Leader Behavior: Its Description and Measurement*, Bureau of Business Research, Ohio State University, Columbus, OH, pp. 6-38.
- [6] Rauch, C.F. and Behling, O. (1984), "Functionalism: basis for an alternate approach to the study of leadership", in Hunt, J.G., Hosking, D.M., Schriesheim, C.A. and R., Stewart (Eds), *Leaders and Managers: International Perspectives on Managerial Behavior and Leadership*, Pergamon Press, New York, NY, pp. 45-62.
- [7] Cohen, W.A. *The Art of a Leader*, Jossey-Bass, Englewood Cliffs, NJ; 1990.
- [8] Al-Sawai, A. "Leadership of healthcare professionals: where do we stand?", *Oman Medical Journal*, 2013, Vol. 28 No. 4, pp. 285-287
- [9] Agarwal, R. A guideline for quality accreditation in hospitals. *Quality digest*, 2010, available at: www.qualitydigest.com/inside/twitter-ed/guideline-quality-accreditation-hospitals.html# [accessed 13 December 2019]
- [10] Bolman, L.G. and Deal, T.E. (2003), "Reframing

- leadership”, in Gallos, J.V. (Ed.), *Business Leadership*, Jossey-Bass, San Francisco
- [11] Joint commission international (JCI) (2017), “Joint commission international accreditation standards for hospitals including standards for academic medical center hospitals 6th edition”, available at: www.jointcommissioninternational.org/jci-accreditation-standardsfor-hospitals-6th-edition/ (accessed 12 July 2019).
- [12] NABH Accredited Hospitals, 2109; NABH website <https://www.nabh.co/firmViewAccreditedHosp.aspx> (accessed on 13 December 2019)
- [13] Shaw, C., Kutryba, B., Crisp, H., Vallejo, P. and Sunol, R. (2009), “Do European hospitals have quality and safety governance systems and structures in place?”, *Quality & Safety in Health Care*, Vol. 18, pp. i51-i56
- [14] Quality Council of India. National Accreditation Board for Hospitals & Healthcare Providers (NABH). Available from: <http://www.qcin.org>. [Last accessed on 2019 Jul 03].
- [15] Fischer EA, Jayana K, Cunningham T, Washington M, Mony P, Bradley J, Moses S. Nurse Mentors to Advance Quality Improvement in Primary Health Centers: Lessons From a Pilot Program in Northern Karnataka, India. *Glob Health Sci Pract*. 2015 Dec 17;3(4):660-75.
- [16] Fuentes, C., Benavent, F., Moreno, M., Cruz, T. and Val, M. (2000), “Analysis of the implementation of ISO 9000 quality assurance systems”, *Work-Study*, Vol. 49 No. 6, pp. 229-241
- [17] Kirsten Brubakk, Gunn E. Vist, Geir Bukholm, Paul Barach and Ole Tjomsland. A systematic review of hospital accreditation: the challenges of measuring complex intervention effects. *BMC Health Services Research* 2015;15:280
- [18] Mumford, V., Forde, K., Greenfield, D., Hinchcliff, R. and Braithwaite, J. (2013), “Health services accreditation: what is the evidence that the benefits justify the costs?”, *International Journal for Quality in Health Care*, Vol. 25 No. 5, pp. 606-620
- [19] Nandraj S, Khot A, Menon S, Brugha R. A stakeholder approach towards hospital accreditation in India. *Health Policy Plan*. 2001 Dec;16 Suppl 2:70-9
- [20] National Patient Safety Implementation Framework (2018-2025). Ministry of Health & Family Welfare, Government of India
- [21] Needle, David (2004). *Business in Context: An Introduction to Business and Its Environment*. 5th Edition; South-Western Cengage Learning
- [22] Bent R, Seaman EA, Ingram A. staff motivation in small food manufacturing enterprises. *Br Food J*. 1999;101:654-67
- [23] Steers RM, Porter LW. *Motivation and work behavior*. 5th ed. New York: McGraw-Hill; 1999
- [24] Deal T. E. and Kennedy, A. A. (1982, 2000) *Corporate Cultures: The Rites and Rituals of Corporate Life*, Harmondsworth, Penguin Books, 1982; reissue Perseus Books, 2000
- [25] Tsai, Y. “Relationship between Organizational Culture, Leadership Behavior and Job Satisfaction.” *BMC Health Services Research*. 2011; *BMC Health Serv Res* (11)1, 98
- [26] Green, J. and Thorogood, N. (1998), *Analysis of Health Policy: A Sociological Approach*, Longman, London
- [27] Casida, J. and Pinto-Zipp, G. (2008), “Leadership-organizational culture relationship in nursing units of acute care hospitals”, *Nursing Economic*, Vol. 26 No. 1, pp. 7-15
- [28] Shortell, S., O'Brien, J. and Carman, J. (1995), “Assessing the impact of continuous quality improvement/total quality management versus implementation”, *Health Services Research*, Vol. 30 No. 2, pp. 377-401.
- [29] Bhaskar Purohit, Dharmen Patel, Surabhi Purohit. A Study of Organizational Values in Government Run Primary Health Centres in India. Volume: 16 issue: 2, page(s): 303-313
- [30] Park, I.T., Jung, Y.Y. and Suk, S.H. (2017), “The perception of healthcare employees and the impact of healthcare accreditation on the quality of healthcare in Korea”, *Journal of Hospital Administration*, Vol. 6 No. 6, pp. 20-27
- [31] Saadati, M., Yarifard, K., Azami-Agdash, S. and Tabrizi, J.S. (2015), “Challenges and potential drivers of accreditation in Iranian hospitals”, *International Journal of Hospital Research*, Vol. 4 No. 1, pp. 37-42
- [32] Rahat, N., “Healthcare accreditation in India-Key factors & challenges”, paper presented to the Proceedings of International Conference 2017, TMIMT, Moradabad
- [33] World Health Report. Working Together for Health. 2006; WHO: Geneva. http://www.who.int/whr/2006/whr06_en.pdf
- [34] Priya Sinha and Sigamani. Key challenges of human resources for health in India. *Global Journal of Medicine and Public Health*. 2016. Vol. 5, issue 4
- [35] Northouse, P. G. *Leadership: Theory and Practice (Sixth Edition)*. Thousand Oaks, CA: Sage Publications 2013
- [36] Dileep Mavalankar, KV Ramani, Jane Shaw. Management of RH Services in India and the Need for Health System Reform. W.P.No. 2003-09-04 September 2003; Indian Institute of Management Ahmedabad-380 015 India
- [37] Ramani & Mavalankar Dileep. Health System in India: Opportunities and Challenges for Improvements. Indian Institute of Management, Ahmadabad, India; WP No. 2005-07-03
- [38] Mathioudakis A, Rousalova I, Gagnat AA, Saad N, Hardavella G. How to keep good clinical records. *Breathe (Sheff)*. 2016;12(4):369-373.
- [39] Sarika Chaturvedi, Bharat Randive, Joanna Ravend, Vishal Diwan, Ayesha De Costa. Assessment of the quality of clinical documentation in India's JSY cash transfer program for facility births in Madhya Pradesh. *International Journal of Gynaecology and Obstetrics*. Volume 132, Issue 2, February 2016, Pages 179-183
- [40] Thomas J. Medical records and issues in negligence. *Indian J Urol*. 2009;25(3):384-388
- [41] Manoj Mohanan, Katherine Hay, Nachiket Mor. Quality of Health Care in India: Challenges, Priorities and the Road Ahead. *Health Affairs*, Vol. 35, No. 10: Insurance, the ACA, Care in India & More;

<https://doi.org/10.1377/hlthaff.2016.0676>

- [42] Rahat, N. "Healthcare accreditation in India-Key factors & challenges", paper presented to the Proceedings of International Conference 2017, TMIMT, Moradabad
- [43] De Vos, M., Graafmans, W., Kooistra, M., Meijboom, B., Van Der Voort, P. and Westert, G. (2009), "Using quality indicators to improve hospital care: a review of the literature", *International Journal for Quality in Health Care*, Vol. 21 No. 2, pp. 119-129
- [44] Reena Duggal, Shukla Balvinder & Sunil Kumar Khatri. Opportunities and Challenges of Using Big Data Analytics in Indian Healthcare System. October 2016; *Indian Journal of Public Health Research and Development* 7(4):238
- [45] Shruti Tripathi, Rachna Sharma and Shyama Nagarajan. Health Information Systems in India: Challenges and way forward. Munich Personal RePEc Archive Paper No. 87067, posted 3 June 2018
- [46] Zhang, J., Patel, V.L., & Johnson, T.R. Medical error: Is the solution medical or cognitive? *Journal of the American Medical Informatics Association*. 2008; 6 (Supp1), 75-77. doi:10.1197/jamia.M1232
- [47] Al Kuwaiti, A. Application of Six Sigma Methodology to Reduce Medication Errors in the Outpatient Pharmacy Unit: A Case Study from the King Fahd University Hospital, Saudi Arabia. *International Journal for Quality Research*. 2016; 10(2), 267-278
- [48] Tabish. *Hospital & Health Services Administration: Principles & Practice Edition: First (Reprint) Chapter: Hospital Management: Challenges and Strategies* 2005. Publisher: Oxford University Press
- [49] WHO Bulletin of the World Health Organization. 2004; Volume 82, Number 2, February 2004, 82-159
- [50] McDermott DR. A comparative analysis of the community contributions and profits of Virginia's hospitals. *Health Care Manage Rev*. 2007 Apr-Jun;32(2):179-87
- [51] Joint commission international (JCI) (2017), "Joint commission international accreditation standards for hospitals including standards for academic medical center hospitals 6th edition", available at: www.jointcommissioninternational.org/jci-accreditation-standardsfor-hospitals-6th-edition/ (accessed 12 July 2019)