Developing a Conceptual Model on Human Resource Planning of Rural Healthcare Centers of West Bengal Based on TOE Framework : A Qualitative Study Using NVIVO

Satakshi Chatterjee [1]
Arunangshu Giri [2]
Soumendra Nath Bandyopadhyay [3]

Abstract

Purpose : The objective of this short communication was to identify the factors that were responsible for this disparity between the supply and demand of healthcare professionals and its impact on perceived service quality.

Design/Methodology/Approach : A qualitative research design was used to create a conceptual model in this study. Personal interviews were conducted with 43 respondents. All of these respondents were working in various administrative roles in various rural healthcare centers. These data were analyzed with the help of the software tool NVIVO 14.0.

Findings : The findings demonstrated the significant influence of technological, organizational, and environmental factors on the supply and demand of healthcare professionals' human resource planning (HRP). Additionally, the perceived quality of services was impacted by hospital HRP.

Practical Implications : In the global setting, most healthcare systems struggle with a lack of clinical and non-clinical personnel; this was particularly the case in rural areas. The need for healthcare services is growing, yet there is a significant gap in the availability of medical personnel in large cities compared to rural or isolated areas. This has grown to be a major worry, and it must be given top priority attention.

Originality/Value : This brief statement developed a conceptual model on the elements influencing the West Bengal Rural Healthcare Centers' HRP process in contrast to earlier studies on HRP in the healthcare sector.

Keywords : human resource planning, rural healthcare centers, TOE, NVIVO

JEL Classification Code : C120, C310, C380, M100, O150

Paper Submission Date : September 5, 2023 ; Paper sent back for Revision : November 15, 2023 ; Paper Acceptance Date : December 10, 2023 ; Paper Published Online : January 15, 2024

The healthcare industry is service-driven and hence, it is very evident that human resources are driving the performance of this industry (Haddadfar et al., 2023). Its delivery is contingent upon the generation of

[1] *Assistant Professor,* Amity School of Business, Amity University, Ranchi - 834 002, Jharkhand.
(Email : satakshichatterjee777@gmail.com) ; ORCID iD : https://orcid.org/0000-0003-1224-3192
[2] *Head & Associate Professor,* School of Management & Social Science, Haldia Institute of Technology, Haldia - 721 657, West Bengal. (Email : arunangshu.giri@hithaldia.ac.in) ; ORCID iD : https://orcid.org/0000-0003-1937-868X
[3] *Professor & Principal,* NSHM Institute of Health Sciences, NSHM Knowledge Campus, Kolkata - 700 053, West Bengal.
(Email : soumendra1701@yahoo.co.uk) ; ORCID iD : https://orcid.org/0000-0001-8302-3387

healthcare workers in accordance with population demand, their sufficient supply, and their appropriate distribution. This is a crucial step in the planning of the human resources process.

With the changing times, there is a considerable change in the staffing requirements. These changes are based on the changes in patient characteristics, the aging pre-existing staff, changes in service reimbursements, lack of training, lack of career opportunities, worsening working conditions, changes in the work values of the employees, and many more (Winter et al., 2020). Hence, the labor market of the healthcare industry is being greatly affected by this push-and-pull scenario. However, the fact cannot be denied that the availability of adequate healthcare human resources can lead to a perception of quality healthcare services being provided to the recipients. It is a daunting task to measure the quality of care in rural hospitals. This is due to the lack of reporting of quality data as a majority of the rural hospitals are critical access hospitals wherein the norms of measurement of healthcare quality are very different (O'Hanlon et al., 2019). Service quality is a measurement tool that is used very commonly to measure the quality of the services (Giri et al., 2020). Therefore, the purpose of this study is to determine the variables (technological, organizational, and environmental, in particular) that affect the demand and supply of healthcare human resources as well as the perceived quality of the services that patients receive. This brief communication's goal is to develop a conceptual model based on the characteristics that the TOE framework discovered, their subsequent impact on the healthcare industry's HRP process, and their continued influence on perceived service quality.

Review of Literature

TOE Framework

In order to give patients high-quality healthcare services, technological technologies are highly helpful. Technology is incredibly useful in the current healthcare system. Additionally, the technology-bound service delivery system has a wide range of functions. The usage of technology, according to healthcare administrators, can be useful in making the entire healthcare system more effective (Chatterjee et al., 2019). All of these factors have a positive effect on patient outcomes. The collective attitude of the healthcare staff determines the organizational factors. This attitude can be determined by the willingness of the employees working across the different rural healthcare centers to share their domain knowledge, train, and learn (Balarajan et al., 2011). Finally, environmental factors cater to the dire shortage of medical professionals, especially in rural areas. This impacts the accessibility to healthcare services in different areas as the disease profile and the demographics of different regions have certain trademark characteristics (Giri et al., 2018; Rathi, 2017).

Healthcare Human Resource Planning

Healthcare human resource planning (HRP) can be elucidated with the theory of demand and supply, which can be useful in understanding the dynamics of the labor market (Zhu et al., 2019). This aids in our comprehension of the differences in the distribution of healthcare professionals among various locales (Giri & Chatterjee, 2020). The supply side of HRP is determined by the production of healthcare professionals who are trained to provide patients with high-quality treatment. It is in charge of developing the pool of individuals who have the potential to benefit society in the future. Their recruitment in their respective specialized domains and their training also play a very important role (Zhu et al., 2019). From the demand side, quality, cost, and accessibility serve to be important factors, and their impact on the perceived healthcare service is something that needs to be studied (Giri, Chatterjee et al., 2019).

Perceived Service Quality

Perceived service quality of the healthcare services is a broad area that caters to multiple functions. Some of these factors include timely treatment provided to the patients, the reputation of the healthcare center, and the interpersonal care given to the patients during their treatment (Mohammad Mosadeghrad, 2014). The final factor in determining the quality of a service is how well it is handled, which is quite important. Patients' decisions about their courses of action are also influenced by cost, and the service center's reputation influences their perception of the quality of the healthcare services they receive (Mohammad Mosadeghrad, 2014; Verma & Singh, 2020).

Research Methodology

Data Collection

A qualitative approach is used for this study. The data were collected from 43 administrators who are currently working in the rural community healthcare centers of West Bengal. The time period of the study is from April – July 2023. These respondents were identified by using convenience sampling (Chakraborty et al., 2020). They have experience in understanding the supply and demand of personnel in the healthcare industry. Out of the 43 individuals, 32 were males and 11 were females. The average work experience for the 43 respondents was 11.3 years. Interviews were conducted of all the 43 respondents and the process was continued until a theoretical saturation point was reached. According to Malterud et al. (2016), the typical point of data saturation for a qualitative investigation happens at 30. The present investigation employed semi-structured interviews. The respondents were asked to share their thoughts on the organizational, technological, and environmental components of healthcare HRP and how it affects the perceived quality of healthcare services.

Data Analysis

A step-by-step process was used to analyze the data that was collected. First, the interviews that were conducted were coded into texts. All 43 transcripts were merged into one single one by collating all the responses. In this single response sheet, every research question was addressed separately. Second, by eliminating spaces, special characters, and numeric values from the transcript, data cleaning was completed. Each case remained consistent with the others. Thirdly, we identified stop words. The final transcript was imported and examined in NVIVO 14.0, marking the fourth and last stage. Building an appropriate codebook and matching responses to the themes that were emerging from the interviews helped to preserve intercoder reliability. By using a group consensus-based methodology, the data's face validity was also confirmed. After extracting the analysis's primary content, a word cloud was produced. By using the NVIVO software's autocode capability in conjunction with theme analysis, this was achieved.

Analysis and Results

The data analysis reveals that all three dimensions of the TOE framework have an impact on healthcare HRP. However, the hierarchical charts reveal that technological factors have the most impact. This is because the proliferation of new technology in today's age has opened up various avenues to accomplish tasks with minimum effort. The technological factors provide utility for the entire process and also help derive the functionality of the entire system. After the technological factors, the environmental factors are seen to have the most influence, followed by the organizational factors. Focusing on environmental factors is pertinent in this domain because it

deals with the very sensitive topic of the shortage of healthcare professionals in rural areas. Understanding this concept is crucial to developing a successful recruitment and retention plan. When developing the HRP strategy, the region's demographics and pertinent illness profile must also be taken into account. Finally, but no less crucial, organizational components include the willingness to train and educate individuals so they can deal with any challenging situation. The workforce needs to be receptive to education as well. Figure 1 displays the word cloud and hierarchy chart.

The word cloud and hierarchy chart in Figure 2 illustrates how demand-related factors play a role in determining the perceived quality of care in rural healthcare centers. Ensuring adequate accessibility is imperative for healthcare facilities situated in rural areas. This affects a substantial portion of the population, and as a result,

Figure 1. *Word Cloud and Hierarchy Chart of TOE Framework as NVIVO Output*
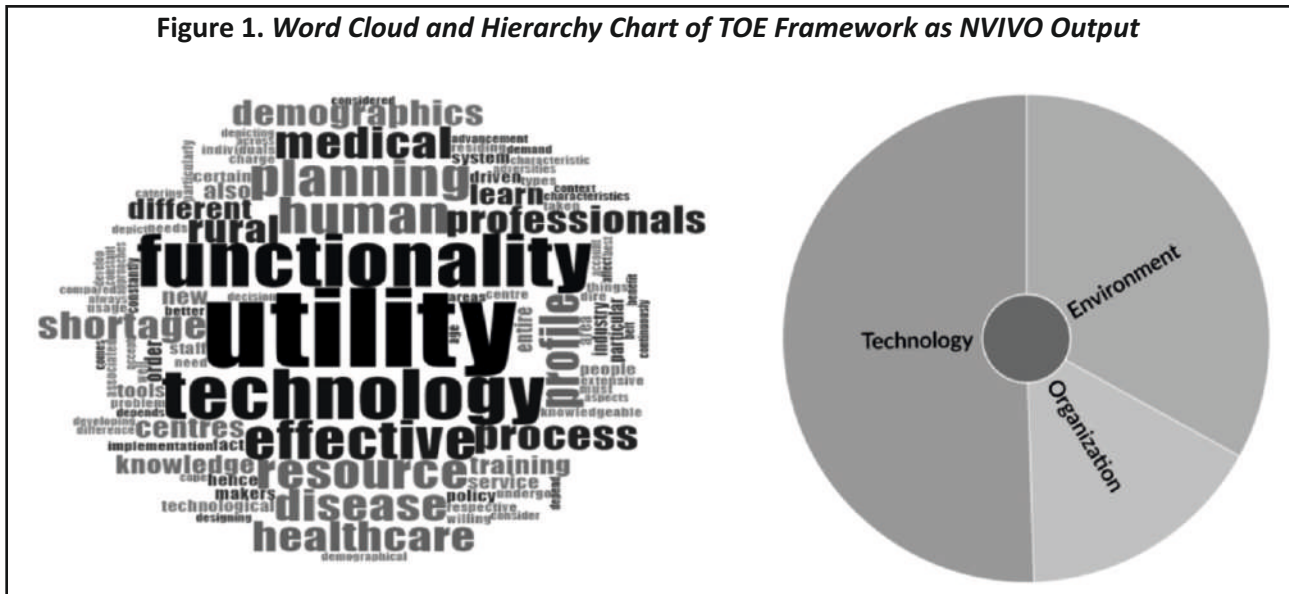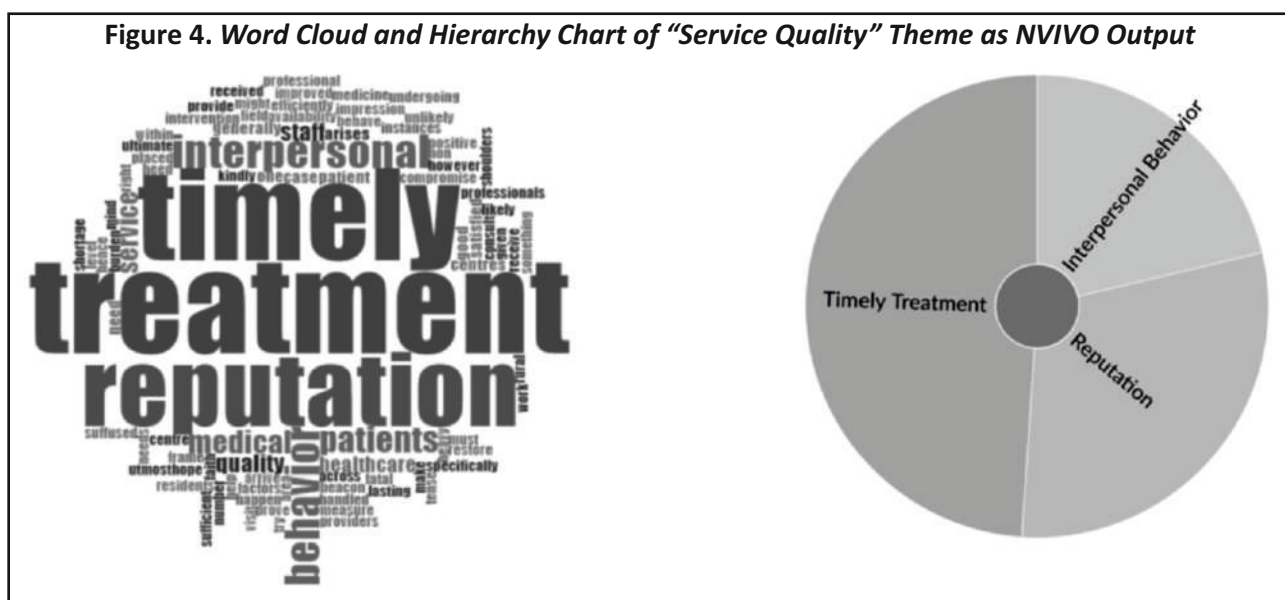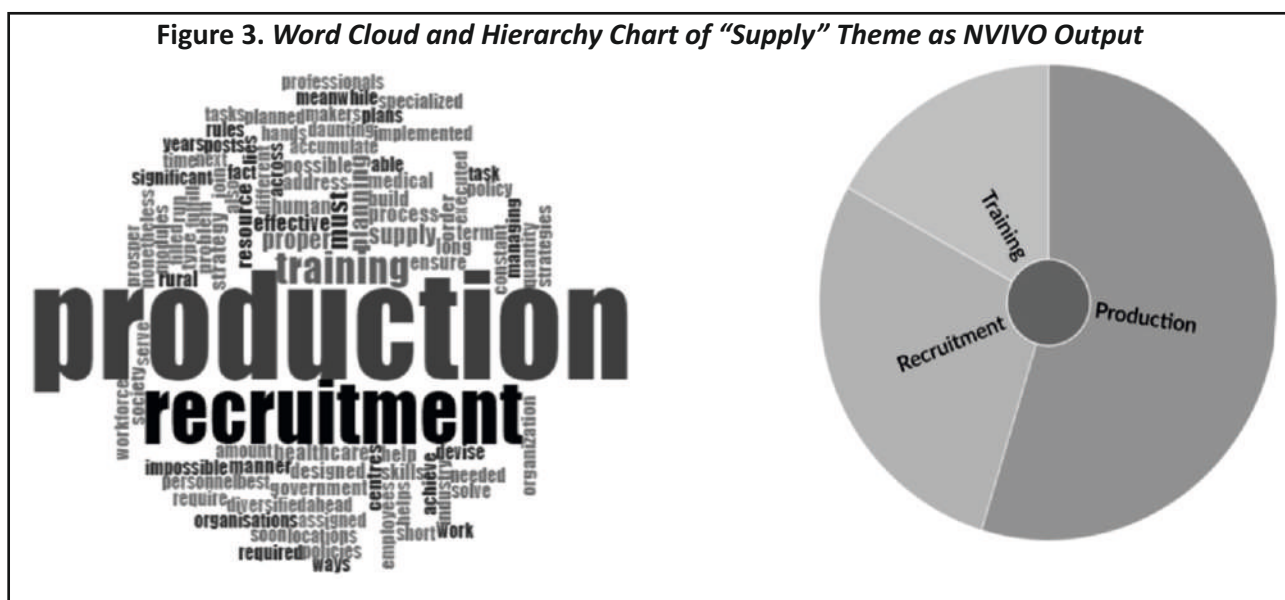

Figure 2. *Word Cloud and Hierarchy Chart of "Demand" Theme as NVIVO Output*
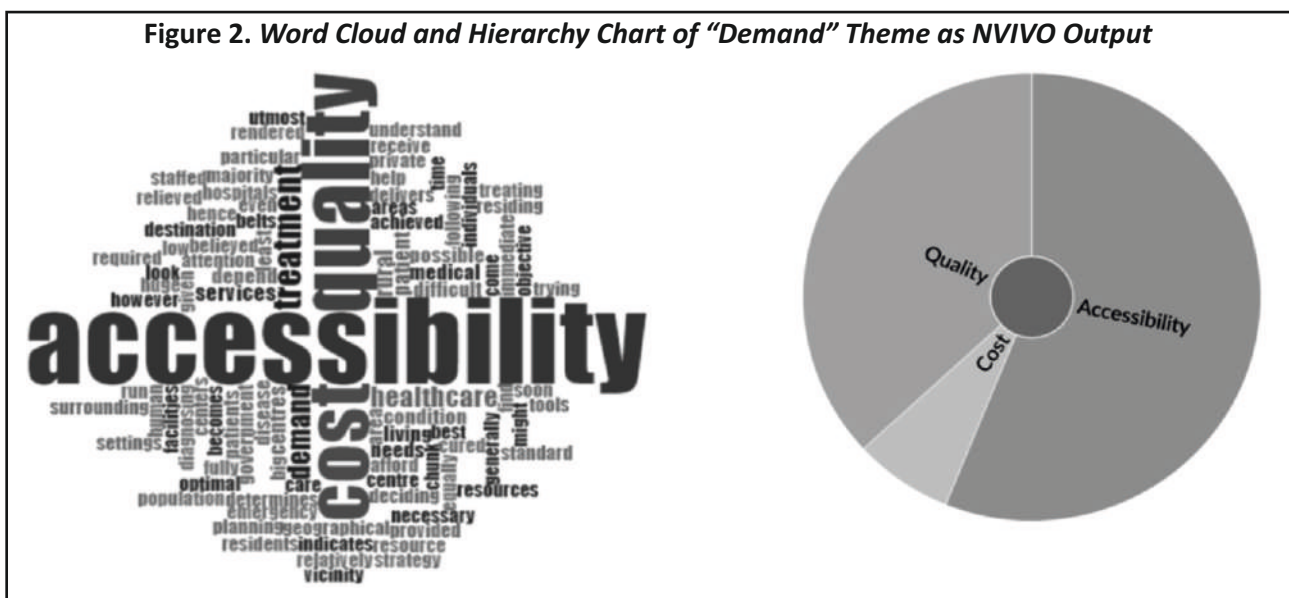
they suffer. In the most adverse cases, the situation proves to be fatal. Hence, accessibility proves to be a major factor in determining the perceived service quality, followed by quality and cost (Giri & Pandey, 2016). Since many rural healthcare facilities lack specialized human resources, patients must travel to larger cities in order to receive those treatments. Furthermore, most institutions lack the infrastructure necessary for sophisticated diagnostic techniques, which lowers the standard of care. Rural healthcare facilities are, nevertheless, state-funded from an economic perspective. Patients find it incredibly difficult to rely on rural healthcare centers for any advanced treatment plans or diagnostic services.

The training and recruiting of healthcare personnel are the next most crucial aspects in the supply-related variables hierarchy chart shown in Figure 3. For healthcare personnel to be hired and trained appropriately, there must be a sufficient number of them in each specialist area of the market. Developing appropriate recruitment

Figure 3. *Word Cloud and Hierarchy Chart of "Supply" Theme as NVIVO Output*

Figure 4. *Word Cloud and Hierarchy Chart of "Service Quality" Theme as NVIVO Output*

tactics is also crucial to matching the right person with the right position at the right time (Regy & Malini, 2019). Finally, training is required for healthcare human resources so they can properly handle the patients involved by understanding their psychology and mentality.

Three separate factors are highlighted in the hierarchy chart of perceived service quality shown in Figure 4. These include patient care delivered promptly, social conduct, and the standing of rural medical facilities. Treatment in a timely manner is the most important element. A significant portion of the population is not able to receive timely treatment due to accessibility issues. This issue needs to be addressed immediately, and steps should be taken to find solutions with the aid of HRP. Second, the medical facilities' standing is crucial. Patients have been observed to gravitate toward hospitals with solid reputations for the caliber of their medical staff and amenities. Finally, the perceived level of service quality at rural healthcare institutions is determined by the way hospital staff members interact with one another and treat patients with compassion and care.

Conceptual Model

The conceptual model and different constructs have been derived with the help of qualitative analysis using NVIVO (Figure 5).

Figure 5. *Conceptual Model*
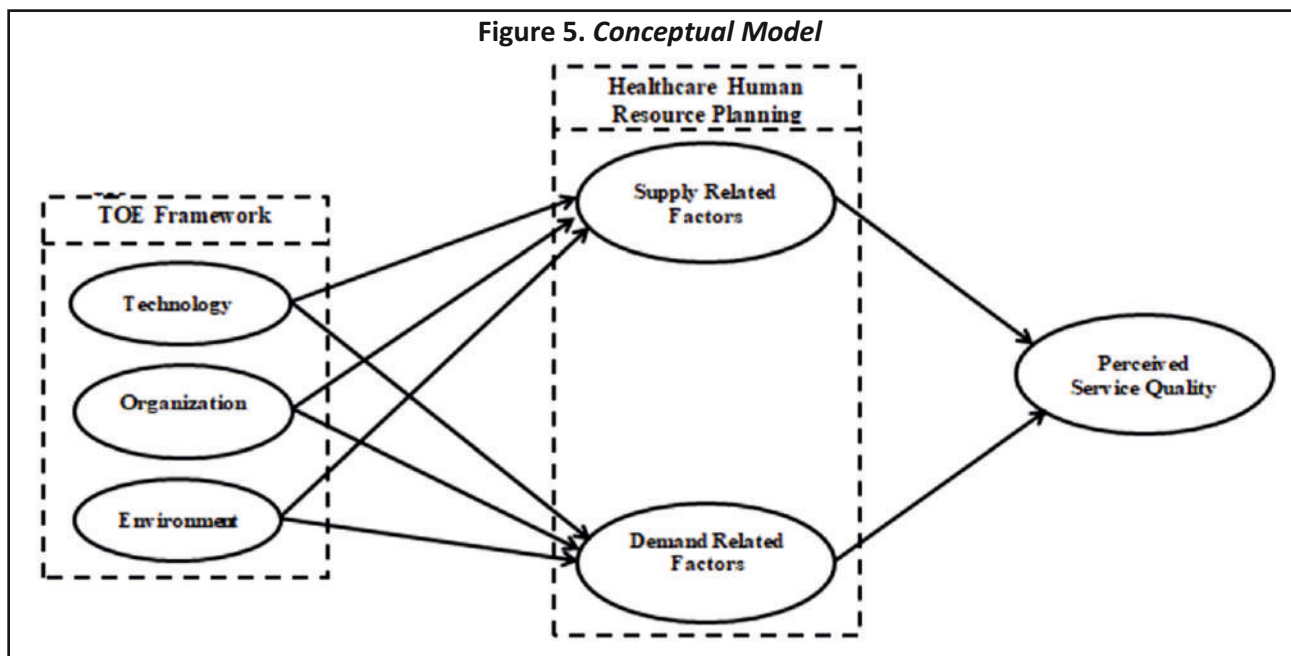
Conclusion

With the qualitative analysis done in this study, a conceptual model has been developed. The antecedents in the conceptual model are explained with the help of the TOE framework that involves three domains, that is, technology, organization, and environment. With the help of the word cloud and hierarchy chart, technology-related factors are found to be most important, followed by environment-related factors, and then finally, organizational-related factors. The TOE framework has a distinct impact on supply-related factors and demand-related factors, that are two components of healthcare HRP. And finally, healthcare HRP has an impact on the perceived service quality.

Theoretical and Managerial Implications

In this research subject, this brief message has numerous theoretical and administrative consequences. Examining the theory behind the TOE framework in greater detail is beneficial when considering its theoretical implications. Understanding the three domains of environment, organization, and technology in the context of the healthcare sector is beneficial. Furthermore, the theory of supply and demand is further studied and analyzed to get a deeper understanding of the role the TOE framework has on supply and demand-related factors (Giri, Gangopadhyay et al., 2019). Finally, the entire process of HRP in rural healthcare centers has been studied to understand its implications on the perceived service quality of all the stakeholders associated with the rural healthcare industry per se (Pillai & Abhilash, 2022; Yadav et al., 2019).

In terms of managerial implications, it helps the hospital administrators gain a deeper understanding of the HRP process about the three dimensions of technology, organization, and environment. Furthermore, understanding these three domains helps the senior administrators focus on the different points that are crucial for the analysis of the supply and demand of healthcare professionals. The conceptual model being established in this brief communication will be useful for rural healthcare centers in developing future recruitment and retention strategies for healthcare human resources. Furthermore, the perceived quality of the services offered by rural healthcare institutions will be greatly enhanced by an effective approach to acquiring healthcare resources.

Future Scope of Research

This conceptual model that has been created with qualitative data can be verified by a quantitative research design in the future. The study can be expanded to cover different geographical areas so that the results obtained can be generalized. Also, a cross-sectional study can be executed with the help of a validated questionnaire, and then this model can be established empirically. Also, a comparative study can be executed between the Indian rural healthcare centers with those of the other developing and developed nations as a future course of action. This will help the researchers to delve further into this topic.

Authors' Contribution

The study article was reviewed and edited by Satakshi Chatterjee, who also came up with the concept and created the conceptual framework. She also took part in the literature review and worked with Dr. Soumendra Nath Bandyopadhyay and Dr. Arunangshu Giri to draft the manuscript. Dr. Giri helped with data analysis and confirmed the study's methodology. Dr. Bandyopadhyay pointed out the consequences and the study's potential future applications.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in an organization or entity with a financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

Funding Acknowledgment

References

Balarajan, Y., Selvaraj, S., & Subramanian, S. (2011). Health care and equity in India. *The Lancet, 377*(9764), 505–515. https://doi.org/10.1016/S0140-6736(10)61894-6

Chakraborty, S., Giri, A., Biswas, S., & Bag, M. (2020). Measuring the impact of celebrity endorsement on consumer purchase intention of beauty soap in Indian context. *International Journal of Scientific & Technology Research*, *9*(2), 1019–1022. https://www.ijstr.org/final-print/feb2020/Measuring-The-Impact-Of-Celebrity-Endorsement-On-Consumer-Purchase-Intention-Of-Beauty-Soap-In-Indian-Context.pdf

Chatterjee, S., Giri, A., Paul, P., & Bag, M. (2019). Impact of 'customer relationship management (CRM) software' on patient satisfaction in public hospitals of urban West Bengal, India: An empirical analysis. *International Journal of Engineering and Advanced Technology*, *8*(5), 521–526. https://www.ijeat.org/wp-content/uploads/papers/v8i5/E7133068519.pdf

Giri, A., & Chatterjee, S. (2020). Impact of fluid team performance on strategic HRM: An empirical study in the organized retail sector of West Bengal. *Prabandhan: Indian Journal of Management*, *13*(4), 25–42. https://doi.org/10.17010/pijom/2020/v13i4/151824

Giri, A., & Pandey, M. (2016). Relationship marketing as an effective promotional tool of yoga marketing in the urban Indian market: An empirical study. *Indian Journal of Marketing*, *46*(5), 42–54. https://doi.org/10.17010/ijom/2016/v46/i5/92488

Giri, A., Biswas, W., & Biswas, D. (2018). The impact of social networking sites on college students: A survey study in West Bengal. *Indian Journal of Marketing*, *48*(8), 7–23. https://doi.org/10.17010/ijom/2018/v48/i8/130536

Giri, A., Chatterjee, S., Biswas, S., & Aich, A. (2020). Factors influencing consumer purchase intention of daily groceries through B2c websites in metro-cities of India. *International Journal of Scientific & Technology Research*, *9*(1), 719–722. https://www.ijstr.org/final-print/jan2020/Factors-Influencing-Consumer-Purchase-Intention-Of-Daily-Groceries-Through-B2c-Websites-In-Metro-cities-Of-India.pdf

Giri, A., Chatterjee, S., Paul, P., & Chakraborty, S. (2019). Determining the impact of artificial intelligence on 'developing marketing strategies' in organized retail sector of West Bengal, India. *International Journal of Engineering and Advanced Technology*, *8*(6), 3031–3036. https://doi.org/10.35940/ijeat.F9030.088619

Giri, A., Gangopadhyay, S., Majumder, J., & Paul, P. (2019). Model development for employee retention in Indian construction industry using structural equation modeling (SEM). *International Journal of Management*, *10*(4), 196–204. https://doi.org/10.34218/IJM.10.4.2019.019

Haddadfar, A., Emamgholipour, S., Razani, M., & Salehnejad, M. H. (2023). Nurses' job preferences for working in deprived areas in Tehran: A discrete choice experiment. *Human Resources for Health*, *21*(1), 91. https://doi.org/10.1186/s12960-023-00875-9

Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample size in qualitative interview studies: Guided by information power. *Qualitative Health Research*, *26*(13), 1753–1760. https://doi.org/10.1177/1049732315617444

Mohammad Mosadeghrad, A. (2014). Patient choice of a hospital: Implications for health policy and management. *International Journal of Health Care Quality Assurance*, *27*(2), 152–164. https://doi.org/10.1108/IJHCQA-11-2012-0119

O'Hanlon, C. E., Kranz, A. M., DeYoreo, M., Mahmud, A., Damberg, C. L., & Timbie, J. (2019). Access, quality, and financial performance of rural hospitals following health system affiliation. *Health Affairs*, *38*(12), 2095–2104. https://doi.org/10.1377/hlthaff.2019.00918

Pillai, S. V., & Abhilash, V. S. (2022). Modeling and evaluation of circular layout facility in hospitals. *Prabandhan: Indian Journal of Management*, *15*(2), 55–67. https://doi.org/10.17010/pijom/2022/v15i2/168335

Rathi, A. (2017). Inequalities in financing of healthcare in India. *Trends in Immunotherapy, 1*(1), 50–51. https://doi.org/10.24294/ti.v1.i1.44

Regy, J., & Malini, D. H. (2019). Impact of high performance work practices on employee engagement in apparel manufacturing and retail firms. *Prabandhan: Indian Journal of Management*, *12*(2), 7–22. https://doi.org/10.17010/pijom/2019/v12i2/141753

Verma, A., & Singh, P. (2020). Elucidating the effect of learning ability on employees' potential: A study of IT sector in India. *Prabandhan: Indian Journal of Management*, *13*(2), 7–22. https://doi.org/10.17010/pijom/2020/v13i2/150561

Winter, V., Schreyögg, J., & Thiel, A. (2020). Hospital staff shortages: Environmental and organizational determinants and implications for patient satisfaction. *Health Policy*, *124*(4), 380–388. https://doi.org/10.1016/j.healthpol.2020.01.001

Yadav, D. K., Yadav, J., & Malik, R. (2019). E-HRM: A paradigm shift in HR practices and its effects on perception of employees towards accepting this new technology. *Prabandhan: Indian Journal of Management*, *12*(2), 23–39. https://doi.org/10.17010/pijom/2019/v12i2/141754

Zhu, B., Hsieh, C.-W., & Mao, Y. (2019). Addressing the licensed doctor maldistribution in China: A demand-and-supply perspective. *International Journal of Environmental Research and Public Health, 16*(10), 1753. https://doi.org/10.3390/ijerph16101753

About the Authors

Satakshi Chatterjee has been conducting research and teaching for more than eight years. She graduated from the University of Mysore in Karnataka in 2016 with honors, ranking first among her peers. She is the author of 27 research articles published in reputable national and international journals, several of which are Scopus-indexed. She is the author of three books as well.

Dr. Arunangshu Giri has worked in industry, research, and education for more than 14 years. He is currently Head of the School of Management and Social Science, Haldia Institute of Technology, West Bengal, and Associate Professor. Seventy-one of his research articles have been published in peer-reviewed national and international journals, including ABDC-ranked and Scopus journals. In addition, he is the author of eight books that are available through SAGE, PHI, New Age International, and other publishers.

Dr. Soumendra Nath Bandyopadhyay is working as a Principal at NSHM Institute of Health Sciences, Kolkata. He has completed his Doctor of Literature from Tumkur University, India, and his PhD from NIT, Durgapur, and he has numerous national and international publications to his credit.