**Title of the article**: **An Assessment of the Public Healthcare System by Measuring Patients’ Experience about Healthcare in Alipurduar District, India**

**Type of article:** Original

**Corresponding Author**

Name: Barnali Biswas

Address: Department of Geography, Cooch Behar Panchanan Barma University, Vivekananda Street, Cooch Behar-736101, West Bengal, India

Phone numbers: +91 8346014715

E-mail address: barnalibiswas@002gmail.com

**Total number of pages:** 12

**Total number of Tables:** 06

**Source(s) of support:** This study has not received any grant from any funding agency.

**Conflicting Interest:** Conflicting Interest does not exist in this study.

**Patient consent for publication:** Not required for this study. There is no experiment on Animal and Human subject. This study fully based on the experience of the patients after taking an official permission from CMOH (Chief Medical Office of Health), Alipurduar, India and this study don’t disclose any personal information of the patients.

**Data availability statement:** Data will be available on request and this article consists all relevant data.

**Abstract**

**Introduction:** Measuring the experience of patients is an essential step to develop patient-centered care and to identify the effectiveness of the public healthcare system.

**Objectives:** This paper tries to measure the experience of the patients about the care they have received in order to analyze the status of healthcare services in the three levels of the public healthcare system.

**Methodology:** To conduct this study, a systematic random sampling technique has been applied and seven points Likert scale has been used to collect the primary data from the patients with the sample size 300. Data have been analyzed by applying Exploratory Factor Analysis and ANOVA. In addition, a perception study has been conducted in order to collect information about patients’ experiences.

**Results:** This study identifies that the services delivered in these centers are not suitable to fulfill the needs of the patients and also highlights that the experience of the patients is varied among different levels of the public healthcare system.

**Conclusion:** Patients from the centers under the primary and secondary levels are mostly satisfied than those patients who have received care from the center under the tertiary level. The different tiers in healthcare have some different hidden problems which can’t be measured quantitatively.

**Key-words:** Healthcare, Patients’ Experience, Variation in Services

**Introduction**

The report of the Bhore Committee, 1946 was considered as a landmark for India’s current healthcare system [1] which divided the healthcare system into three tiers on the basis of the services delivered. But India’s health system was designed a long time back when expectations of the public sectors were quite different. [2] Over the last few decades, while the economic development of India has been gaining momentum, [3] India’s public healthcare system is at crossroads. Private healthcare services have expanded rapidly due to the failure of the public healthcare system to provide accessible and equitable quality healthcare.

At present, to ensure the standards for health facilities and to assess the quality of care, several methods have been introduced in India. [4, 5] But, the measurement of quality of healthcare is a complicated phenomenon due to its intangible nature. Now a days, the experience of patients has been given more importance as it helps to measure the quality of the healthcare system as an important step to establish patient-centered care. [6] To identify the inequality in healthcare services, the paper tries to measure the experience of patients about healthcare among three different levels of the Public healthcare system.

**Material and Methods**

# Questionnaire design: PREM (Patient Report Experience Measure) method has been applied which is a measurement of patients’ perception of their personal experience to the care they have received. [7] To measure the experience of the patients, 20 questions have been taken into consideration by adopting Consumer Assessment of Healthcare Providers & Systems (CAHPS) survey Questions (2018). [8] This questionnaire is suitable for both indoor and outdoor patients and has been written in two languages Bengali and English so that respondents feel comfortable with the questions. Seven points Likert scale has been used to evaluate the experience of the respondents. To conduct this study, permission has been taken from CMOH (Chief Medical Officer of Health), Alipurduar District for field survey.

**Selection of Health Centers:** The public health care system in India is of the three-tier system, namely Tertiary, Secondary and Primary [9] and in every level, different types of facility centers are available. This study mainly measures the patients’ experience among three different levels of the Public healthcare system and for this purpose, one single center has been purposively chosen from each level of the Public healthcare system. Lastly, one hospital or healthcare center from each tier has been randomly selected.

**Sampling:**  The total population of this district has been taken into consideration to select the sample size of the patients as the public healthcare facilities provide services to the whole population of the district. With a 90 % confidence level and a 5 % margin of error, 271 sample is obtained for the study because the sample size between 30 and 500 is generally sufficient for much research. [10] A total of 300 Sample size has been taken to round up the sample 271 to minimize the error and from each level, 100 patients have been selected. By using a random sampling technique, the required primary data have been collected from those patients who visited or were admitted to these centers.

**Analysis:** Firstly, Exploratory Factor Analysis (EFA) has been used which helps to reduce the measurable and observable variables to fewer latent variables that share a common variance and are unobservable. [11, 12] To measure the reliability of the questions, Cronbach’s Alpha has been calculated where the acceptable value of Cronbach’s Alpha should be more than 0.70. To measure the inequality in the experience of patients between the facilities available under three healthcare centers, ANOVA test has been applied and lastly, the Post Hok test has been applied to identify the specific differences in the patients’ experience.

**Results**

**Table: 1**

To examine the Construct validity of 20-items, a principal component method has been applied to Exploratory Factor Analysis in IBM SPSS Statistics 20.0 version. The KMO value is 0.935 which is more than 0.60 indicating the Sampling Adequacy in the study. One item has been deleted because of lower KMO value in the Anti-image correlation table and the significance value of Bartlett's Test of Sphericity shows sufficient correlation lying in the data set.

**Table 2**

The EFA result reveals that three factors can explain 73.529 % of the variance. Two items have been removed in the second step as they did not have communality value of more than 0.50. The remaining 17 items have been analyzed again by the PCA method with varimax rotation. The first component explains 48.241 % of the total variance whereas the extracted last component can explain 12.406 % of the total variance.

**Table 3**

The Cronbach alpha value of a total of 17 items is 0.932, showing a higher level of consistency in the data set. The extracted three factors are interpretable and the categorization of the items can be explained.

**Responsiveness:** The most influential factor in healthcare, indicating that patients appreciate doctors who provide sufficient time to the patients’ questions and who give clear explanations of treatments, [13] and the factor loadings range from 0.870 to 0.679 in this respect.

**Cleanliness:**The second important component, having factor loadings 0.819 and 0.811, that can explain 12.882 % of the variance defined as the level of cleanliness of toilets and ward rooms in the healthcare centers.

**Infrastructure:**The third component, defined as the condition of physical facilities and the presence of resources involved in rendering the services. [14] The three items in infrastructure have a strong correlation with the factor, ranging from 0.749 to 0.652.

**Table4**

From table 4, it can be understood that the result of Cronbach’s Alpha of 17 parameters is 0.926, showing the higher level of internal consistency in the study and the Alpha value of each of the three indicators provides an acceptable result, i.e. more than 0.70. Table 4 also shows that the mean value of Responsiveness is highest (4.231 ± 1.017) whereas the cleanliness of the services has the lowest value (0.604 ± 0.766) because most of the respondents have experienced the unclean condition of the toilet and wardroom. The Mean values of Infrastructure (3.283 ± 0.692) indicate that the quality of these services is below the moderate level. The mean score of the perception of respondents about the overall condition of healthcare services is 3.255 out of 7 points which is showing patients in these three healthcare centers are not fully satisfied with the overall condition of healthcare services.

**Table 5**

From table 5, it is noticed that a significant variation (p = 0.000) is found on the experience of the patients among three types of healthcare centers. The mean variation on the perception of patients about Responsiveness is highest with 0.743 effect size which is a large effect according to Cohen’s classification of effect size. In the case of cleanliness and infrastructure, the effect size is 0.071 and 0.060 indicating a medium effect of the type of healthcare centers on patients’ experience about these.

**Table 6**

The highest mean difference in the experience of the respondents about Responsiveness is found between District Hospital and Primary Healthcare Center (2.10134) with a 5 % level of significance. Besides, the lower difference is found in Cleanliness (0.00704 and p = 0.999) and Infrastructure (0.14341 and p = 0.551) between Rural Hospital and PHC, showing physical facilities, equipment and cleanliness are lesser related to three levels of the healthcare center.

**Discussion**

**Variation in Healthcare Services**

The quality of treatment is a predisposing factor in improving patients’ satisfaction levels. [14] In these three tiers of healthcare centers, patients are lesser satisfied with the quality of care they have received from District Hospital as compared to other healthcare centers. In addition, patients are fully unsatisfied with the condition of cleanliness and infrastructure than the responsiveness of care.

This study shows that the variation of the experience of patients to the healthcare services is mainly found between District hospital and Primary Health Center because there are huge differences in the type of services provided and availability of facilities provided from these two centers. Among three levels of the public healthcare system, the higher variation is mainly found in Responsiveness of care which indicates cognitive, emotive and behavioral components of healthcare, [15] which are highly different from the lower level to higher level. As District hospital mostly deals with serious cases and provides services to a large number of patients, it affects the behavior of the providers and the time they spend with the patients. Besides, the hospital serves many patients from other states due to its locational reason. As a consequence, most of the time, the District hospital experiences huge patient pressure. As compared to the Tertiary level, the Secondary and Primary level centers provide lesser services and serve a lesser number of patients. Therefore, it is easier to maintain the cleanliness and infrastructural conditions of these healthcare centers.

**Perception of Patients about Healthcare**

In the District hospital, most of the patients have the same type of complaint that the providers remain too busy and don’t have time to speak with them. According to a senior Doctor in the District hospital, almost all the time, the hospital serves two or three times more patients than its capacity. Due to the shortage of personnel, the nurses and doctors are compelled to do jobs of others and for huge patient pressure, as consequence, their interaction with patients as well as the quality of care is affected. [16] Though in the Tertiary level, patients receive a higher level of services, although they are found unsatisfied with the care as compared to the other two types of centers. During the survey, it is noticed that in Alipurduar District Hospital, the authority provides mattresses due to the scarcity of beds and on the other hand in Rural Hospital and PHC, the beds remain vacant. This situation is indicating an inequality of the pressure of patients among different healthcare facilities.

According to the experience as obtained from the field study in primary and secondary health care centers, it is revealed that few doctors perform their services from their residences during duty hours. This should be a negligence by the Doctors to their patients but as per the Consumer Protection Act, 1986 all the patients should be treated as a consumer even the treatment is given free of cost [17]. In addition, there is a tendency of a few doctors to refer the emergency patients elsewhere for avoiding risk. Non-adherence to the referral system guidelines, lack of confidence and accountability in each level for controlling unnecessary referrals, [18] is one of the important reasons for the increasing rate of referral. This also increases the cost of treatment as well as difficulties for the patients and their families significantly. During this transition of care, specialists may receive insufficient information or reporting of findings that may be delayed, potentially endangering patients. [19, 20]

**Conclusion**

The patients’ experience is an important indicator of healthcare services as it is based on the perception of patients who have received the care. This study reveals that among different services provided by these centers, Responsiveness is the most important service, indicating most of the patients expect emotional support and good behavior from the healthcare providers followed by good infrastructural conditions and cleanliness of the hospital. But among the different facilities in the three levels of the public healthcare system, the variation of responsiveness is highest. Patients from the primary and secondary centers are more satisfied than those patients who have received care from the tertiary level. Different tiers in healthcare have different problems and some of them can’t be measured quantitatively and are often overlooked by the Healthcare Authority. Therefore, it is highly essential to identify the ailments in different levels of the Public Healthcare System by collecting feedback from the patients in both quantitative and qualitative ways and steps should be taken accordingly.

**Author Contribution:** All authors are participated in the review of the literature, design, setting and analysis of data and in manuscript writing.

**Conflicting Interest:** Conflicting Interest does not exist in this study.

**Funding:** This study has not received any grant from any funding agency.

**Patient consent for publication:** Not required.

**Data availability statement:** Data will be available on request and this article consists all relevant data.

**Acknowledgement**

We are indebted and grateful to the persons who have encouraged, inspired and assisted us to complete this work, particularly CMOH of Alipurduar District who have given us permission to carry out the survey for this study.

**References**

1. Bajpai V, Saraya A. For a realistic assessment: A social, political and public health analysis of Bhore Committee. Social Change. 2011 Jun; 41(2):215-31.
2. Peters DH, Rao KS, Fryatt R. Lumping and splitting: the health policy agenda in India. Health policy and planning. 2003 Sep 1; 18(3):249-60.
3. Ramani KV, Mavalankar D. Health system in India: opportunities and challenges for improvements. Journal of health organization and management. 2006 Nov 1.
4. National Accreditation Board for Hospitals and Healthcare Providers, [NABH Standards for Small Healthcare Organisations (SHCO), 2006](http://nabh.co/shco-standard.aspx); accessed Oct. 13, 2016.
5. G. Gyani, “India,” in Braithwaite J, Matsuyama Y, Johnson J. Healthcare reform, quality and safety: perspectives, participants, partnerships and prospects in 30 countries. CRC Press; 2017 Mar 2.
6. Gupta I, Bhatia M. The Indian Health Care System. International Health Care System Profiles.
7. Hodson M, Andrew S, Roberts CM. Towards an understanding of PREMS and PROMS in COPD. Breathe. 2013 Sep 1; 9(5):358-64.
8. What Is Patient Experience? AHRQ.<https://www.ahrq.gov/cahps/about-cahps/patient-experience/index.html>
9. Chokshi M, Patil B, Khanna R, Neogi SB, Sharma J, Paul VK, Zodpey S. Health systems in India. Journal of Perinatology. 2016 Dec; 36(3):S9-12.
10. Delice A. The Sampling Issues in Quantitative Research. Educational Sciences: Theory and Practice. 2010; 10(4):2001-18.
11. Bartholomew DJ. Factor analysis for categorical data. Journal of the Royal Statistical Society: Series B (Methodological). 1980 Jul; 42(3):293-312.Coulter A, Jenkinson C. European patients' views on the responsiveness of health systems and healthcare providers. European journal of public health. 2005 Aug 1; 15(4):355-60.
12. Yong AG, Pearce S. A beginner’s guide to factor analysis: Focusing on exploratory factor analysis. Tutorials in quantitative methods for psychology. 2013 Oct; 9(2):79-94.
13. Coulter A, Jenkinson C. European patients' views on the responsiveness of health systems and healthcare providers. European journal of public health. 2005 Aug 1; 15(4):355-60. <https://doi.org/10.1093/eurpub/cki004>
14. Irfan SM, Ijaz A, Farooq MM. Patient satisfaction and service quality of public hospitals in Pakistan: an empirical assessment. Middle-east journal of scientific research. 2012; 12(6):870-7.
15. Bhanu P. Patient satisfaction. Journal Cutan Aesthet Surg. Sep-Dec. 2010 Sep; 3(3):151-5.
16. Mercer SW, Reynolds WJ. Empathy and quality of care. Br J Gen Pract. 2002 Oct 1; 52(Suppl):S9-12.
17. Agrawal AD, Banerjee A. Free medical care and consumer protection. Indian J Med Ethics. 2011 Oct: 240-.
18. Gupta AK, Talati S, Sudip Bhattacharya AS. Health system strengthening-focusing on referrals: an analysis from India. JOJ Nurs Heal care. 2017; 2(10.19080).
19. Gandhi TK, Sittig DF, Franklin M, Sussman AJ, Fairchild DG, Bates DW. Communication breakdown in the outpatient referral process. Journal of general internal medicine. 2000 Sep 1; 15(9):626-31.
20. Patel MP, Schettini P, O’Leary CP, Bosworth HB, Anderson JB, Shah KP. Closing the referral loop: an analysis of primary care referrals to specialists in a large health system. Journal of general internal medicine. 2018 May 1; 33(5):715-21.

**Table: 1**

|  |  |  |
| --- | --- | --- |
| **KMO and Bartlett's Test** | | |
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | 0.935 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 3320.272 |
| df | 136 |
| Sig. | 0.000 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 2: Total Variance Explained** | | | | | | | | | | |
| **Component** | **Initial Eigenvalues** | | | **Extraction Sums of Squared Loadings** | | | **Rotation Sums of Squared Loadings** | | | |
| **Total** | **% of Variance** | **Cumulative %** | **Total** | **% of Variance** | **Cumulative %** | **Total** | **% of Variance** | **Cumulative %** |
| 1 | 8.928 | 52.518 | 52.518 | 8.928 | 52.518 | 52.518 | 8.201 | 48.241 | 48.241 |
| 2 | 2.214 | 13.024 | 65.541 | 2.214 | 13.024 | 65.541 | 2.190 | 12.882 | 61.124 |
| 3 | 1.358 | 7.988 | 73.529 | 1.358 | 7.988 | 73.529 | 2.109 | 12.406 | 73.529 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table 3: Rotated Component Matrix** | | | |
| **Variables** | **Component** | | |
| **1** | **2** | **3** |
| **Responsiveness** |  |  |  |
| Hospital staffs Provide comfort to patients | .870 |  |  |
| Doctors provide enough reply to clarify everything | .846 |  |  |
| Doctors/ staff are willing to help/facilitate the patients | .842 |  |  |
| Explain the procedure of treatment | .817 |  |  |
| Giving enough time for checkup | .815 |  |  |
| Patients are taken individual attention by health care provider | .802 |  |  |
| Explain whom to contact in case the disease is worsening | .795 |  |  |
| Staff understand patients’ specific need | .779 |  |  |
| Providers involve patients in decisions regarding treatment | .770 |  |  |
| Provider's explaining things could be understand | .714 |  |  |
| Maintenance of patient privacy and confidentiality | .713 |  |  |
| Cooperate with patients' family | .679 |  |  |
| **Cleanliness** |  |  |  |
| Cleanliness in wards / rooms |  | .819 |  |
| Cleanliness of toilets |  | .811 |  |
| **Infrastructure** |  |  |  |
| Availability of Bedding Facilities |  |  | .749 |
| In time delivery of reports/ service |  |  | .652 |
| Level of availability of required drugs on time |  |  | .652 |
| Extraction Method: Principal Component Analysis.  Rotation Method: Varimax with Kaiser Normalization. | | | |
|  | | | |

**Table4: Descriptive Statistics of Components of Healthcare Quality and Measurements Results**

|  |  |  |  |
| --- | --- | --- | --- |
| **Services** | **Mean** | **Std. Deviation** | **Cronbach's Alpha** |
| **Responsiveness** | 4.231 | 1.017 | 0.955 |
| **Cleanliness** | 2.252 | 0.604 | 0.766 |
| **Infrastructure** | 3.283 | 0.692 | 0.705 |
| **Overall Patients' Experience** | 3.255 | 0.614 | 0.926 |

Source: Compiled by Author

**Table 5: Result of ANOVA to Identify Variation in Patients’ Experience among different Healthcare Centers**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Services** | **Type of Healthcare Center** | **Mean** | **Std. Deviation** | **F** | **Sig.** | **Effect Size ( η2 )** |
| **Responsiveness** | **PHC** | 1.0978 | 0.4899 | 428.982 | 0.000 | 0.743 |
| **RH / CHC** | -0.0942 | 0.6659 |
| **Dist. HOS** | -1.0036 | 0.3054 |
| **Cleanliness** | **PHC** | 0.1921 | 0.8580 | 11.413 | 0.000 | 0.071 |
| **RH / CHC** | 0.1851 | 1.0575 |
| **Dist. HOS** | -0.3772 | 0.9748 |
| **Infrastructure** | **PHC** | 0.2392 | 1.0078 | 9.436 | 0.000 | 0.060 |
| **R H / CHC** | 0.0958 | 0.8772 |
| **Dist. HOS** | -0.3350 | 1.0270 |

Source: Compiled by Author

**Table 6: Result of Post Hok Test to Identify Variation in Patients’ Experience among different Healthcare Centers**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Dependent Variable** | **( I ) Type of Hospital** | **( J) Type of Hospital** | **Mean Difference (I-J)** | **Std. Error** | **Sig.** |
| **Responsiveness** | **PHC** | R H | 1.19193\* | 0.07196 | 0.000 |
| Dist. HOS | 2.10134\* | 0.07196 | 0.000 |
| **R H / CHC** | PHC | -1.19193\* | 0.07196 | 0.000 |
| Dist. HOS | .90941\* | 0.07196 | 0.000 |
| **Dist. HOS** | PHC | -2.10134\* | 0.07196 | 0.000 |
| R H | -.90942\* | 0.07196 | 0.000 |
| **Cleanliness** | **PHC** | R H | .00704 | 0.13674 | 0.999 |
| Dist. HOS | .56926\* | 0.13674 | 0.000 |
| **R H / CHC** | PHC | -.00704 | 0.13674 | 0.999 |
| Dist. HOS | .56222\* | 0.13674 | 0.000 |
| **Dist. HOS** | PHC | -.56926\* | 0.13674 | 0.000 |
| R H | -.56222\* | 0.13674 | 0.000 |
| **Infrastructure** | **PHC** | R H | .14341 | 0.13759 | 0.551 |
| Dist. HOS | .57422\* | 0.13759 | 0.000 |
| **R H / CHC** | PHC | -.14341 | 0.13759 | 0.551 |
| Dist. HOS | .43081\* | 0.13759 | 0.005 |
| **Dist. HOS** | PHC | -.57422\* | 0.13759 | 0.000 |
| R H | -.43081\* | 0.13759 | 0.005 |
| \*. The mean difference is significant at the 0.05 level. | | | | | |

Source: Compiled by Author