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RESEARCH ARTICLE

ECONOMIC EVALUATION OF TELEMEDICINE SERVICES PROVIDED AT SATELLITE CENTRE FOR TRIBAL HEALTH AND RESEARCH, ABU ROAD, SIROHI, RAJASTHAN, INDIA

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ABSTRACT

BACKGROUND:

Assessing health technology is a vital tool for determining whether interventions should be continued or stopped. Delivering efficient medical services in remote tribal, hilly regions demands careful planning to maximize limited resources. To identify the effectiveness of telemedicine centres, we conducted an economic evaluation of telemedicine services in term of avoidance of patient transportation costs.

METHODS:

A quantitative telemedicine evaluation was conducted telephonically with patients and hospital authorities. By analyzing direct and indirect costs, including setup, operations, and patient-related expenses, as well as patient satisfaction levels, the study provides insights into the sustainability of telemedicine in resource-constrained settings.

MAIN OUTCOME MEASURES:

Economic impact of telemedicine services, reduction in patient transportation expenses, financial sustainability of telemedicine centres, and patient satisfaction and healthcare accessibility.

RESULTS:

The analysis reveals that telemedicine can significantly reduce patient transportation costs, making healthcare more accessible and affordable, particularly for underserved populations in tribal and hilly regions. The study also highlights substantial operating costs driven by staff salaries and emphasizes the importance of efficient budget planning and resource allocation.

CONCLUSIONS:

The findings underscore the potential of telemedicine to promote health equity by reducing disparities and improving health outcomes. To fully understand the impact of telemedicine services, a comprehensive economic evaluation considering patient outcomes, quality of care, and long-term cost savings is recommended.

KEYWORDS
cost-analysis; telemedicine; tribal health; avoidance of travel cost; decision analysis.

INTRODUCTION

In lower-middle-income countries like India, the vast population and significant distances between regional towns and major cities pose substantial challenges to access specialized healthcare services in remote areas [1]. India employs a three-tier healthcare system designed to serve its diverse populace. Primary health centres (PHCs) cater to village-level needs, secondary health centres operate at district levels, and tertiary-level hospitals provide advanced care in major cities [2]. Despite this structured approach, the availability of healthcare in rural regions remains inadequate [3]. This inadequacy is primarily due to the concentration of highly qualified medical professionals in urban settings, leaving rural areas underserved [4].

Furthermore, the disparity in healthcare access is exacerbated by a notable shortage of hospital beds in rural regions compared to urban counterparts [5]. This shortfall in infrastructure further limits the capacity to provide adequate healthcare services to rural populations. Geographical challenges, particularly pronounced in the northern and northeastern parts of the country, add another layer of complexity to the delivery of healthcare services [6 , 7]. The rugged terrain and often underdeveloped transportation networks in these regions make it difficult to reach and serve these populations effectively, thereby deepening the healthcare divide between urban and rural areas [8]. While telehealth care is not a novel concept in India, it is experiencing increased momentum with ongoing initiatives to develop a standardized IT-enabled healthcare infrastructure [9, 10]. Integrating telemedicine and related technologies holds substantial potential, especially in tribal and hilly regions, to transform healthcare delivery for rural populations by providing cost-effective, high-quality medical services [11]. Empirical studies indicate that the implementation of telemedicine across Asia can significantly enhance the efficacy of healthcare systems [12]. By reducing the necessity for extensive travel, telemedicine can lower patients' travel-related expenses and time commitments, thereby improving their overall quality of life and reducing out-of-pocket expenditures [13]. This technological advancement also has the potential to decrease overall healthcare costs by streamlining service delivery and minimizing the need for physical consultations. The adoption of telemedicine not only bridges the healthcare accessibility gap but also promotes equitable healthcare distribution across different socio-economic and geographical segments [14, 15].

In organisational settings, particularly within the healthcare sector, prioritizing interventions necessitates a comprehensive analysis of epidemiological trends, geographical considerations, operational requirements, client preferences, resource availability, and cost implications [16]. Health technology assessment (HTA) plays a vital role in optimizing the allocation of healthcare resources by evaluating the effectiveness and value of interventions compared to other potential uses of the same resources [17].

Although telemedicine is widely accepted, especially in remote areas, further research is needed into its economic impact in hilly tribal regions [18, 19]. The study aims to compare the costs of telemedicine services with the transportation costs incurred by patients. This comparison will help assess the viability and impact of telemedicine in peripheral and referral hospitals, providing insights into its potential to improve healthcare delivery in these challenging environments.

MATERIALS AND METHODS

STUDY SETTING

The Ministry of Tribal Affairs, Government of India, has designated the All India Institute of Medical Sciences (AIIMS), Jodhpur, as a "Centre of Excellence (COE) for Tribal Health" to address the healthcare needs of tribal communities [20]. This specialized centre adopts a comprehensive approach to tackle health issues and develop strategies to bridge gaps

in healthcare services using modern scientific tools, particularly telemedicine services [20, 21]. A dedicated teleconsultation centre, the Satellite Centre for Tribal Health and Research (STHR), was established 250 kilometres from AIIMS Jodhpur to serve the tribal population within a radius of 100 kilometres or more. The workflow of STHR for patients across various specialities is illustrated in Supplementary Figure 1.

DATA COLLECTION

Data were collected through telephone interviews using a structured questionnaire (for assessing telemedicine services at STHR and CHC/PHCs). The questionnaire was designed to capture information on the economic aspects of telemedicine, patient satisfaction levels, sustainability, and value in tribal healthcare.

The data for this study were collected prospectively over one year (December 1, 2022, to November 30, 2023) from STHR. Patient data from teleconsultations is systematically stored in a computerized database, and routine audits are conducted to ensure data accuracy and compliance. During the 12-month study period, 1,638 patients received telehealth services, primarily referred from nearby CHCs and PHCs. Data from CHCs and PHCs were collected retrospectively over a three-month period (from December 1, 2022, to February 28, 2023). Subsequently, personal telephonic interviews were conducted using validated questionnaires.

COST INCURRED BY STHR

From the government's perspective, direct medical expenditures for STHR included building infrastructure, equipment procurement, furniture, staff member salaries, software acquisition expenses, internet system costs, monthly maintenance charges, etc [22].

COST INCURRED BY PATIENTS

From the patient's perspective, the direct non-medical cost of treatment was determined by including only transportation expenses [23]. We analyzed the travel costs of all patients who consulted at a peripheral government hospital (CHC/PHCs) and were referred to a higher-level center. Data on travel expenses to referral hospitals were gathered through telephonic interviews. Additionally, the same data on travel was collected from the patients of the STHR. Each element was evaluated to calculate the total non-medical expenses incurred per patient throughout the treatment [22].

COST ANALYSIS

A cost analysis of telemedicine services was conducted from both the healthcare system's and the patient's perspectives. Quantitative methodologies were utilized, and the referrals came from four peripheral government hospitals, including one CHC and three PHCs, which serve a large population in the hilly tribal regions of Abu Road in the Sirohi district. The analysis focused on the avoidance of travel cost by patients referred through CHC/PHCs to STHR. A cost analysis of telemedicine services at STHR was conducted, analyzing the costs associated with establishing and operating the teleconsultation centre and the expenses incurred by patients accessing these services [24].

STATISTICAL ANALYSIS

Statistical analysis was conducted using Microsoft Excel. Descriptive statistics were calculated for each category, including the mean, standard deviation, median, and range. Economic evaluation techniques were employed to determine the incremental cost of each unit of travel expenses avoidance due to telemedicine consultations compared to conventional consultations [25].

RESULTS

STHR TELEMEDICINE CENTRE DATA

During the 12-month study period, the STHR telemedicine centre was visited by 1,638 telehealth patients. A detailed breakdown of the socio-demographic characteristics, including key demographics such as age groups, gender, religion, marital status, and educational status, is provided in Supplementary Table 1. Understanding these characteristics is crucial for tailoring healthcare services to meet the specific needs of the community [26]. Notably, referrals from CHCs/PHCs were

a significant source of information, reflecting the integrated approach of the healthcare system in disseminating information about telemedicine services (Supplementary Table 1) [27]. The various specialties, including Cardiology, Dermatology, Endocrinology, General Medicine, General Surgery, Obstetrics and Gynecology, Nephrology, Neurology, Pediatrics, Physical Medicine and Rehabilitation (PMR), Psychiatry, Pulmonary Medicine, and Urology, were included. General Medicine and Dermatology had the highest number of patient visits, at 30.2% and 29.8%, respectively, indicating a high demand for these services (Supplementary Table 3). The first visit accounted for the highest frequency (95.5% of total visits), suggesting that most patients were new to the telemedicine service. This could indicate effective outreach efforts and a growing acceptance of telemedicine in the community (Supplementary Table 4) [28]. About 24.0% of patients visited healthcare services after a year of illness, 18.6% within one month, and 22.2% within one to three months. These findings highlight the delays in seeking medical care, which may be due to a lack of awareness, accessibility issues, or financial constraints (Supplementary Table 5) [29].

On asking about alternative healthcare options, the Palanpur private hospital (20.1%) was the most preferred alternative, indicating a preference for private healthcare facilities among patients (Supplementary Table 6). Among the total, 88% of patients used public transport, 8.6% used private, and 3.3% used personal vehicles (Supplementary Table 7). This underscores the importance of accessible and affordable transportation options for patients seeking telemedicine services [30].

CHC/PHC DATA

Data from 1,013 patients at nearby CHCs and PHCs were retrospectively collected over three months (01-12-2022 to 28-02-2023) using validated questionnaires and personal telephonic interviews. The socio-demographic characteristics of this population are provided in Supplementary Table 8. General Medicine and Cardiology had the highest number of patient visits, 51.0% and 34.5%, respectively. These findings highlight the common health issues faced by the community and the demand for specific medical services (Supplementary Table 9) [31]. The highest frequencies were observed for patients making more than four visits (35.1%) and those making their first visit (31.7%). This indicates a substantial number of repeat visits, suggesting ongoing healthcare needs and chronic conditions among the patient population (Supplementary Table 10) [32]. Approximately 62.5% of patients visited healthcare services within one week of illness onset, while 29.7% visited within one month. This suggests that a significant portion of the population delays seeking medical care, which could impact health outcomes (Supplementary Table 11) [33]. The data indicated that 90.6% of patients returned to CHC/PHC for follow-up, while 9.4% were referred to another centre. This high follow-up rate at CHC/PHC suggests a strong continuity of care within the local healthcare system (Supplementary Table 12) [34]. The alternative healthcare options included were STHR AIIMS Jodhpur Telemedicine, Sirohi Government Hospital, Sirohi Private Hospital, Palanpur Government Hospital, Palanpur Private Hospital, Udaipur Government Hospital, Udaipur Private Hospital, Ahmedabad Government Hospital, Ahmedabad Private Hospital, and Abu Road Private Hospital. The STHR AIIMS Jodhpur Telemedicine Centre was the highest choice, with 91.1% of patient frequencies (Supplementary Table 13). Public transport was used by 37.9% of patients, private transport by 20.1%, personal vehicles by 31.8%, and others by 10.1%. This indicates the patient population's dependence on public transportation and highlights the need for accessible transport options (Supplementary Table 14) [35].

COST INCURRED BY STHR

The comprehensive costs associated with operating the STHR telemedicine centre encompass several critical components, including building rent, procurement of furniture and equipment, staff salaries, internet and electricity bills, maintenance, and miscellaneous related expenses [36]. This analysis provides a detailed breakdown of these expenditures. The total monthly cost of running the STHR telemedicine centre is ₹70,799, and the corresponding annual cost is ₹8,49,587 (Supplementary Table 15). The most significant portion of monthly and yearly expenses is attributed to human resources, specifically the salaries of staff. In the current operational setup, staff members dedicate 50% of their time to teleconsultation activities.

The remaining 50% of their time is allocated to other activities within the telemedicine centre. Therefore, only 50% of the human resources costs are included in the cost calculation. By including only half of the total human resources costs, the

analysis reflects the dual-functional roles of the staff, ensuring a more accurate financial representation. Capital costs cover the procurement of necessary furniture and equipment for the telemedicine centre. These assets are assumed to have an average lifespan of five years. These capital costs are amortized over the five years to provide a realistic depiction of the financial burden. This results in a monthly capital cost of ₹5,799 and an annual capital cost of ₹69,588. Recurring monthly expenses, including internet, electricity, and maintenance, total ₹70,799. The total yearly operating cost is calculated to be ₹849,588, and its various breakdown is shown in Table 1. The costs for doctors are excluded from this financial analysis. This is because their services are already engaged in AIIMS Jodhpur activities, and their consultations for the telemedicine centre are provided as additional services. Hence, their costs do not represent an incremental financial burden specific to the STHR telemedicine centre.

TABLE 1. THE ANNUAL COST FOR STHR TELEMEDICINE WAS CALCULATED ON BOTH A MONTHLY AND YEARLY BASIS. FOR DETAILED CALCULATIONS, PLEASE REFER TO SUPPLEMENTARY TABLE 15

S. No.	Type of cost	Monthly	Annually
1	**Capital cost (₹)**		
	Building rent, along with maintenance	3,750	45,000
	Equipment: laptop screen, etc*	1,417	17,004
	Furniture and other fixtures*	632	7,584
	Total	**5,799**	**69,588**
2.	**Operating cost (₹)**		
	Human resources**	59,250	7,11,000
	Miscellaneous	3,250	39,000
	Electricity	2,500	30,000
	Total	**65,000**	**7,80,000**
`Total (1+2) (₹)		**70,799**	**8,49,588**

*Assume that the average life of the product is five years. **The current teleconsultation utilizes 50% of the human resources, and the following staff members were involved in other activities of the consultation centres.

COST INCURRED BY PATIENTS

The study aimed to evaluate the direct non-medical costs incurred by patients during treatment, with a primary focus on transportation expenses. Data collection involved assessing travel costs among patients visiting peripheral government hospitals (CHCs/PHCs) who were subsequently referred to higher-level healthcare centres. The data revealed that transportation expenses constituted a significant portion of the total non-medical costs of patients seeking healthcare services [37]. The study identified ten healthcare centres for referrals, and the distances from CHC Abu Road to these centres were calculated, with an average distance of 150 km (Table 2). The cost of public transport, specifically buses and trains, was calculated. The average cost per patient using public transport was ₹226. The median cost of public transport for each health centre was calculated, yielding an average median transport cost per patient of ₹782. The average travel cost for patients using private vehicles, whether two-wheelers or four-wheelers, was ₹1684. The average travel time was determined to be 3.5 hours (range: 0.16 to 12 hours). By multiplying the number of patients by the median transport cost, the total travel cost for 1013 patients visiting CHC/PHCs was ₹5,29,462. When calculated using the average cost, the total was ₹7,92,166 (Table 3). The total cost, combining public, private, personal vehicles, and other transport methods for 1013 patients, was ₹11,46,020. Similarly, for 1638 patients visiting the STHR telemedicine centre, the total transportation cost was calculated to be ₹6,55,956 (Table 4). The analysis revealed that transportation expenses constituted a significant portion of the total non-medical costs borne by patients seeking healthcare services. By aggregating these costs, the study highlighted the financial burden experienced by patients as they navigate different

levels within the healthcare system. This perspective highlights the practical challenges patients encounter in accessing necessary medical care, particularly in terms of affordability and logistical considerations.

Additionally, we assessed patient satisfaction at STHR using a questionnaire. The minimum positive response frequency was 77.7% (Supplementary Table 16).

TABLE 2. TABLE SHOWING THE MODE OF TRANSPORTATION COST BY THE PATIENTS VISITING CHC/PHCS AT ABU ROAD IF THERE IS NO CHOICE OF STHR (N=1013)

S. No.	Health facility	Distance from Abu Road CHC (km)	Cost in public transport, Single person ₹		Cost of private vehicle, two/four-wheeler ₹	Travel time (Hours)	Median Cost ₹	No of patients	Total cost of patient travel ₹
			Bus	Train					
1.	Sirohi govt hospital	69	78	*	312	1.3	195	187	36,465
2.	Sirohi private hospital	70	78	*	312	1.35	195	111	21,645
3.	Palanpur govt hospital	54	150	150	216	1.15	183	82	15,006
4.	Palanpur private hospital	54	150	150	216	1.15	183	232	42,456
5.	Udaipur govt hospital	149	250	*	2,500	4	1,375	14	19,250
6.	Udaipur private hospital	152	250	*	2,500	4	1,375	9	12,375
7.	Ahmedabad govt hospital	216	450	200	4,500	5	1,717	53	91,001
8.	Ahmedabad private hospital	220	450	200	4,500	5	1,717	144	2,47,248
9.	Abu Road Private Hospital	10	0	0	100	0.16	100	143	14,300
10.	Others (Pindwara, Punjab, Mumbai, Jodhpur, Mehsana, etc)	500				12	782	38	29,716
Average/Total		**150**	**₹226**		**₹1,684**	**3.5**	**₹782**	**1,013**	**₹5,29,462/₹7,92,166**

* No direct train is available on this route

TABLE 3. MODE OF TRANSPORTATION COSTS BY PATIENTS VISITING CHC/PHCS AT ABU ROAD (N=1013)

Mode of travel	No of patients	Cost ₹
Public transport	384	86,784
Private transport	204	3,43,536
Own Vehicle	323	5,43,932
Others	102	1,71,768
Total	**1,013**	**₹11,46,020**

TABLE 4. MODE OF TRANSPORTATION COSTS BY PATIENTS OF STHR IF THEY HAVE GONE SOMEWHERE ELSE (N=1638)

Mode of travel	No of patients	Cost ₹
Public transport	1,442	3,25,892
Private transport	141	2,37,444
Own vehicle	55	92,620
Total	**1,638**	**₹6,55,956**

COST ANALYSIS

The cost analysis revealed that the total expenditure for telemedicine services in the year amounted to ₹8,49,588. This figure encompasses all operational costs, including technological infrastructure, staffing, and maintenance of the telemedicine network. This investment underscores the health system's commitment to providing remote healthcare services, which are crucial in areas with limited access to traditional healthcare facilities. From the patients' perspective, telemedicine services offer significant cost savings primarily by reducing the need for travel. The analysis showed that between 1,013 and 1,638 patients could save on transportation costs, with the total savings ranging from ₹5,29,462 to ₹11,46,020. These savings are significant for patients living in remote areas who would otherwise incur substantial travel expenses to access healthcare. When considering the upper range of patient transport costs, telemedicine services provided by STHR should be cost-effective. The breakeven point for cost-effectiveness is noted when the number of patient visits exceeds 2,000 per year. This threshold suggests that as the utilisation of telemedicine services increases, the overall cost per patient decreases, enhancing the value proposition of telemedicine. The primary focus of this analysis was on the avoidance of travel costs by patients referred through CHC/PHCs to STHR. By eliminating the need for patients to travel long distances for consultations, telemedicine services reduce travel expenses, save time, and minimise the physical strain on patients [38, 39].

DISCUSSION

The analysis of telemedicine services at the STHR provides detailed insights into patient demographics, visit patterns, follow-up behaviour, and preferences for alternative healthcare options and transportation methods. A notable finding is the high proportion of first-time visits, indicating successful outreach efforts and patient acceptance of telemedicine. This acceptance is critical in ensuring that telemedicine services are utilized to their full potential, especially in remote and underserved areas [27].

Similarly, Dev et al. (2024) found that utilizing telemedicine for follow-up care significantly reduces both costs and travel distances for patients. This highlights the potential of telemedicine to improve healthcare efficiency and accessibility by reducing the financial and logistical burdens on patients [40]. Patients' significant reliance on public transportation highlights the need for accessible and affordable transportation options. The study revealed that transportation expenses represent a substantial financial burden for patients, particularly when travelling long distances to higher-level healthcare centres. The average distance to referral centres was 150 kilometres, with associated costs of ₹226 for public transport and ₹1,684 for private vehicles. These logistical and financial challenges emphasize the importance of telemedicine in reducing travel costs and improving healthcare accessibility [41]. Similarly, Thakar et al. (2018) reported that telemedicine services surpass in-person care strategies by offering more effective and less expensive follow-up care for a remote post-neurosurgical population in India [42]. The cost-effectiveness of telemedicine is attributed to several factors, including adequate patient volume utilizing telemedicine, high patient satisfaction, the success rate of telemedicine interventions, and reduced patient travel distances. These findings highlight the potential of telemedicine to deliver high-quality, affordable healthcare, particularly in geographically remote or underserved areas. The integration of telemedicine into routine healthcare protocols can significantly enhance the accessibility and efficiency of medical services, aligning with the broader goals of healthcare equity and cost containment. From a cost perspective, the analysis demonstrated that telemedicine services offer significant economic benefits by reducing the need for long-distance travel. Patients visiting

CHC/PHCs incurred higher travel costs (₹11,46,020) than those visiting the STHR telemedicine centre (₹6,55,956). This disparity underscores the potential of telemedicine to alleviate financial burdens on patients. Additionally, the average travel time of 3.5 hours poses a significant inconvenience, leading to delays in care, increased absenteeism from work, and added physical strain, especially for patients with severe health conditions.

Recognizing the multi-functional roles of the staff, the analysis incorporated only 50% of the human resources costs, acknowledging their shared responsibilities between teleconsultation and other activities. This adjustment ensures an accurate reflection of the operational reality. By amortizing capital costs over five years, the study precisely represents the long-term financial commitment required to maintain the necessary infrastructure and equipment. The substantial portion of operating expenses driven by staff salaries highlights the need for efficient resource allocation and budget management. Similarly, Rout et al. (2019) demonstrated that telemedicine linkages resulted in an increased caseload, subsequently leading to a decrease in the cost per case [43]. The study highlights the efficient use of resources and improved treatment compliance facilitated by telemedicine. These findings suggest that scaling up telemedicine initiatives could enhance healthcare delivery by optimizing resource utilization and ensuring better adherence to treatment protocols.

The detailed cost analysis highlights the significant financial requirements for sustaining the STHR telemedicine centre. Efficient budget planning and resource allocation are crucial to ensuring continuous and high-quality telemedicine services. By understanding the distribution of costs and the financial impact of various components, policymakers and administrators can make informed decisions to optimize resource utilization [44]. This analysis offers valuable insights into the telemedicine centre's economic sustainability, highlighting the importance of strategic planning to balance costs with service quality. The study's findings have important implications for healthcare policy and resource allocation. Reducing transportation costs through increased use of telemedicine can alleviate the financial burden on patients. Policymakers should consider expanding telemedicine services, especially in rural and underserved areas, to enhance healthcare accessibility and affordability. The analysis underscores the significant non-medical costs patients incur, primarily due to transportation expenses. By identifying these financial challenges, the study emphasizes the need for strategic interventions to reduce these burdens. Expanding telemedicine services, such as those provided by STHR, can offer a viable solution, improving healthcare access while minimizing non-medical costs [45].

LIMITATIONS

The cost analysis included only 50% of the salaries for the telemedicine unit staff, as they also engage in other activities at the centre. This adjustment may not accurately reflect the full cost of their involvement in telemedicine services. Additionally, the costs for doctors were excluded since their consultations are considered additional services to their existing roles at AIIMS Jodhpur. This exclusion might lead to an underestimation of the actual costs associated with telemedicine services. The cost of equipment, furniture, and fixtures was calculated based on an expected lifespan of five years. This assumption may not account for potential variations in the actual lifespan or maintenance costs, which could affect the overall cost calculations. Furthermore, the cost structure is anticipated to change significantly with the expansion of telemedicine services, potentially impacting future financial analyses. Future studies could address these limitations by using detailed time-motion studies to more accurately apportion staff time, incorporating full economic costing of physician time, and employing sensitivity analyses with alternative equipment lifespans and cost scenarios. Moreover, longitudinal studies capturing cost variations over time and at different implementation scales would enhance the generalizability and policy relevance of future evaluations.

CONCLUSIONS

This comprehensive economic evaluation provides policymakers and stakeholders with critical information on the role of telemedicine in expanding healthcare access to underserved populations and promoting health equity. In conclusion, the cost analysis of telemedicine services reveals the financial investment required and the substantial cost savings that patients can achieve. While STHR's telemedicine services may be cost-effective, particularly with higher patient visit volumes, a more comprehensive economic evaluation is necessary to understand their impact fully. This evaluation should

assess the effectiveness of STHR and its surrounding CHCs/PHCs, including patient outcomes, quality of care, and long-term cost savings. Furthermore, the article examines the broader implications of telemedicine for healthcare delivery in tribal and hilly regions, highlighting its potential to reduce disparities and enhance health outcomes. This study will guide decision-makers in leveraging telemedicine to address healthcare challenges and advance health equity in tribal communities.

DECLARATIONS

- No funding was received to conduct this study.
- The study was started after obtaining ethical approval from the Institute Ethics Committee.
- The authors have no relevant financial or non-financial interests to disclose.
- Data were collected through telephonic interviews using a questionnaire.

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CONFLICTS OF INTEREST

There are no conflicts of interest.

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FIGURE 1: PATIENT WORKFLOW AT THE SATELLITE CENTRE FOR TRIBAL HEALTH AND RESEARCH (STHR)

TABLE 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE POPULATION VISITING STHR (N=1,638)

Parameter	Frequency	Percentage (%)
Age		
0-15 years	246	15
16-30 years	461	28.1
31-45 years	374	22.8
46-60 years	370	22.6
61 years & above	187	11.5
Gender		
Male	885	54
Female	753	46
Religion		
Hindu	1424	86.9
Muslim	216	13.1
Marital status		
Married	1145	69.9
Unmarried	493	30.1
Education		
Illiterate	630	38.4
Primary education	297	18.1
Secondary education	575	35.1
Graduation and above	137	8.4

TABLE 2: SOURCES OF INFORMATION ABOUT STHR FOR THE POPULATION (N=1,638)

Question: From where did you get to know about this centre?	Frequency	Percentage (%)
(a) Heard from peer group	274	16.7
(b) Referred from CHC/PHC	1150	70.2
(c) Referred from private hospital	9	0.6
(d) Saw Advertisement/newspaper/TV	0	0
(e) ASHA/ANM/Sarpanch	9	0.6
(f) Camps	196	12

TABLE 3: DEPARTMENT-WISE DISTRIBUTION OF PATIENTS VISITING STHR (N=1,638)

Department	Frequency	Percentage (%)
Cardiology	23	1.4
Dermatology	488	29.8
Endocrinology	37	2.2
General Medicine	495	30.2
General Surgery	18	1.1
Obstetrics and Gynaecology	50	3.1
Nephrology	5	0.3
Neurology	9	0.6
Pediatrics	249	15.2
PMR	214	13.1
Psychiatry	18	1.1
Pulmonary medicine	18	1.1
Urology	14	0.8

TABLE 4: NUMBER OF VISITS BY PATIENTS TO STHR (N=1,638)

Number of visits	Frequency	Percentage (%)
First	1566	95.5
Second	47	2.9
Third	15	1.0
Fourth	11	0.6

TABLE 5: DURATION BEFORE SEEKING FIRST MEDICAL CARE AT STHR AFTER ILLNESS (N=1,638)

When did you first seek medical care for this illness?	Frequency	Percentage (%)
Within a week	28	1.6
Within a month	306	18.6
1-3 months	365	22.2
3-6 months	407	25
6-12 months	138	8.5
>1 year	394	24.1

TABLE 6: ALTERNATIVE HEALTHCARE OPTIONS IF STHR WAS NOT AVAILABLE (N=1,638)

S. No	If you have not come to this centre, where would you have gone for treatment?	Frequency	Percentage (%)
1.	Sirohi govt hospital	265	16.2
2.	Sirohi private hospital	160	9.7
3.	Palanpur govt hospital	119	7.2
4.	Palanpur private hospital	329	20.1
5.	Udaipur govt hospital	18	1.1
6.	Udaipur private hospital	14	0.8
7.	Ahmedabad govt hospital	73	4.5
8.	Ahmedabad private hospital	187	11.4
9.	Abu Road govt hospital	237	14.5
10.	Abu Road private hospital	196	12
11.	Jodhpur govt hospital	5	0.3
12.	Jodhpur private hospital	5	0.3
13.	Mehsana private hospital	5	0.3
14.	Pindwada govt hospital	18	1.1
15.	Mumbai private hospital	5	0.3
16.	Punjab govt hospital	5	0.3

TABLE 7: MODES OF TRANSPORTATION USED BY PATIENTS VISITING STHR (N=1,638)

If you have gone somewhere else, what transportation would you take?	Frequency	Percentage (%)
Public transport	1442	88
Private transport	141	8.6
Own vehicle	55	3.3

TABLE 8: SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE POPULATION VISITING CHC/PHCS AT ABU ROAD (N=1,013)

Parameter	Frequency	Percentage (%)
Age		
0-15 years	7	0.7
16-30 years	183	18.1
31-45 years	263	26
46-60 years	332	32.8
61 years & above	228	22.5
Gender		
Male	524	51.7
Female	489	48.3
Religion		
Hindu	917	90.5
Muslim	96	9.5
Marital status		
Married	981	96.8
Unmarried	24	2.4
Widow/widower	8	0.8
Education		
Illiterate	153	15.1
Primary education	621	61.3
Secondary education	208	20.5
Graduation and above	31	3.1
Occupation		
Agriculture/ Labour	287	28.3
Govt/private job	50	4.9
Skilled/Unskilled worker	3	0.3
Businessman	76	7.5
Housewife	474	46.8
Unemployed/student	54	5.3
Retired	69	6.8

TABLE 9: DEPARTMENT-WISE DISTRIBUTION OF PATIENTS VISITING CHC/PHCS AT ABU ROAD (N=1,013)

Department	Frequency	Percentage (%)
Cardiology	349	34.5
Dermatology	10	1
General Medicine	517	51
General Surgery	69	6.8
Gynaecology	60	5.9
Neurology	1	0.1
Psychiatry	4	0.4
Urology	3	0.3

TABLE 10: NUMBER OF VISITS BY PATIENTS CHC/PHCS AT ABU ROAD (N=1,013)

Number of visits	Frequency	Percentage (%)
First	321	31.7
Second	245	24.2
Third	76	7.5
Fourth	15	1.5
More than 4 visits	356	35.1

TABLE 11: DURATION BEFORE SEEKING FIRST MEDICAL CARE AT CHC/PHCS AT ABU ROAD (N=1,013)

When did you first seek medical care for this illness?	Frequency	Percentage (%)
Within a week	633	62.5
Within a month	301	29.7
1-3 months	46	4.5
3-6 months	18	1.8
6-12 months	12	1.2
>1 year	3	0.3

TABLE 12: PROPORTION OF PATIENTS TAKING FOLLOW-UP FROM CHC/PHC ITSELF (N=1,013)

Patients coming for follow-up to CHC/PHC	918 (90.6%)
Patients referred from CHC/PHC to another center	95 (9.4%)
Patients coming for follow-up to CHC/PHC	918 (90.6%)
Patients referred from CHC/PHC to another center	95 (9.4%)

TABLE 13: PROPORTION OF PATIENTS' CHOICE FOR REFERRAL TO DIFFERENT HEALTH FACILITIES VISITING CHC/PHCS AT ABU ROAD (N=1,013)

Health facility	Frequency	Percentage (%)
STHR AIIMS Jodhpur Telemedicine	923	91.12
Sirohi govt hospital	33	3.25
Sirohi private hospital	14	1.38
Palanpur govt hospital	9	0.88
Palanpur private hospital	19	1.87
Udaipur govt hospital	2	0.19
Udaipur private hospital	6	0.59
Ahmedabad govt hospital	1	0.09
Ahmedabad private hospital	3	0.29
Abu Road Private Hospital	3	0.29

TABLE 14: MODE OF TRANSPORTATION OPTIONS BY PATIENTS VISITING CHC/PHCS AT ABU ROAD (N=1,013)

If you have gone somewhere else, what transportation would you take?	Frequency	Percentage (%)
Public transport	384	37.9
Private transport	204	20.1
Personal vehicle	323	31.9
Others	102	10.1

TABLE 15: ESTIMATED MONTHLY AND ANNUAL COSTS FOR OPERATING THE STHR TELEMEDICINE CENTER

Details	Cost	Cost (Monthly)	Cost (Yearly)
Rent of the room providing teleconsultations (Monthly)	2500	2500	30000
1 Bed*	5000	83.33333333	1000
1 Curtain*	1000	16.66666667	200
2 Table*	21060	351	4212
2 Chairs Revolving*	10873.5	181.225	2174.7
Laptop 1*	65000	1083.333333	13000
1 Screen*	10000	166.6666667	2000
BP Hb Machine*	6000	100	1200
Weighing machine*	1000	16.66666667	200
Speaker*	3000	50	600
Salary 1 Medical, 1 Nursing officer and 1 MSW**	118500	59250	711000

Internet System Cost yearly	7500	625	7500
Electricity bill of STHR yearly	30000	2500	30000
PHeD Bill (Water Dept.) yearly	9000	750	9000
Cost of stationery used yearly	15000	1250	15000
Cost of Advertisement yearly	1500	125	1500
Maintenance charges yearly	15000	1250	15000
Miscellaneous yearly	6000	500	6000
Total Cost		**70799**	**849587**

*Assume that the average life of the product is 5 years. ** The current teleconsultation utilizes 50% of the staff, and the following staff members were involved in other activities of consultation centres.

TABLE 16: PATIENT SATISFACTION BASED ON QUESTIONNAIRE AT STHR (N=1,638)

Questionnaire	Frequency (Yes)	Percentage (%)
Was it easy to use telemedicine?	1291	78.8
Could you easily talk to a clinician using a telehealth system?	1282	78.3
Were the visits provided over the telehealth system the same as in-person visits?	1287	78.6
Will you use telehealth services again?	1273	77.7
Do you find telemedicine an acceptable way to receive health care services?	1296	79.1
Did the telemedicine services has helped you to improve your health?	1278	78