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Original Research Article

Beneficiary satisfaction with mobile medical units in the state of Andhra Pradesh

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ABSTRACT

Background: Mobile health services in India have gained significant attention recently. However, there is little information regarding the beneficiary satisfaction of such services. Beneficiaries' satisfaction and perception plays significant role in utilization of services. We assess the program beneficiaries' satisfaction of using mobile health services in rural Andhra Pradesh.

Methods: We used a cross-sectional study design to survey the mobile health services program beneficiaries in rural Andhra Pradesh (October 2016 to October 2018). Beneficiaries availing the mobile health services from 277 mobile medical vans across 13523 villages were selected using multistage sampling. Exit interviews (using Likert-scale questions) were used to reveal the ease of access in utilising mobile health services and satisfaction among the program beneficiaries.

Results: A total, 1080 exit interviews were conducted. Above ninety percent of beneficiaries completed the exit interviews (response rate: 95%). More than two-thirds (72%) of the respondents were females and aged >45 years (71%). Of all respondents, the majority were Hindu (89%), belonging to socially disadvantaged groups (80%), and illiterate (56%). Nearly all (95%) program beneficiaries found mobile health services easily accessible and building their knowledge and awareness (94%) on key health issues. Ninety-five percent of the program beneficiaries strongly favoured recommending the use of mobile health services to others. The overall satisfaction rate was 95% (Cronbach alpha 0.925).

Conclusions: Mobile health services in rural areas are effective in meeting the beneficiaries' expectations. High beneficiary satisfaction and trust in mobile health services strongly favours such services in other rural geographies.

Keywords: Diabetes mellitus, Hypertension, Mobile medical unit, Non-communicable disease, Primary health care

INTRODUCTION

India is amongst the first countries to recognise the importance of primary healthcare.[1] However, implementing it in its full potential has been challenging, especially in rural and hard to reach areas.[2] Even though the rural population makes a larger significant part of India's medical visits (86%), the majority still traveling more than 100 km from avail health care and public health facilities.[3] A recent survey estimate reveals the Infant mortality rate (IMR) and the maternal mortality rate (MMR) of India are still high compared to other BRICS nations (41/1000 live birth and 130 respectively).[4] The urban-rural and the inter-state disparities further highlight the inefficiencies within the existing health system. The Global Health Workforce Alliance and World Health Organisation (WHO) categorised, India among 57 countries that face a severe crisis in human resources for health.[5] The WHO benchmark for qualified health workers is 44.5/10,000 population whereas India has 29.1/10000 population a huge shortfall.[6,7] These incompetencies push the patients to seek private healthcare, and that results in increased out of the pocket expenditure.[8] The proportion of households with

catastrophic health expenditures showed an increasing trend from 1993-2014.[9] This further contributes to poor health outcomes in rural areas than their urban counterparts.

Reducing and overcoming the existing barriers in healthcare needs innovative and cost-effective solutions. International organisations urged governments to start adopting alternate and innovative solutions such as public-private partnerships (PPP). Public-private partnerships bring a convergence of private players' interest and public sector goals, which enhance the availability of healthcare to the rural poor.[10] The government of India observed the mobile medical units (MMUs) as an excellent supplement to the existing public health system and is being used extensively to reach the poor and marginalised rural India population.[11] The Andhra Pradesh mobile medical unit program (APMMU) is an innovative public-private partnership with Piramal Swasthya, and the government of Andhra Pradesh started in 2016. It provides primary healthcare to a population of three distinct zones, namely tribal, rural, and hard to reach areas living in 13,523 villages of Andhra Pradesh.

Despite extensively used, systematic evaluation studies of MMUs are minimal, especially in the Indian context. Researchers and scholars in the past attempted to find evidence to substantiate the efficiency of MMUs in serving the underserved. None of those researchers explored beneficiary satisfaction and beneficiaries' perception regarding the services offered through the MMUs. Beneficiary satisfaction is an important indicator of health care quality and is usually linked with greater adherence to medical technology, high health service utilisation, and better health outcomes.[12-15] Therefore, it is essential to understand the beneficiary's satisfaction regarding services provided to improve the health outcomes. This paper aims to estimate the beneficiary's satisfaction with the Andhra Pradesh Mobile medical unit program.

METHODS

Program description and settings

The MMU provides free primary and selective secondary health care services by collaborating with the village ASHA, Anganwadi Workers, sub-centre ANM, and the village health and sanitation committee in 13523 villages across 13 districts Andhra Pradesh. 277 MMUs are operational for 22 days to 24 days in a month, covering two villages each day with 1500 population. The van delivers preventive, promotive, curative, and referral services to the community, thereby bridging the gaps in the healthcare delivery system.

Elements of an MMU

Each van is equipped with highly skilled human resource; a qualified medical doctor (MBBS), a nurse (GNM/MPHA) (generally a female), a pharmacist (D-pharmacy), a laboratory technician (DMLT/BSc MLT), and a driver (SSC with heavy vehicle lenience). The mobile medical unit has arrangements for basic laboratory set up to perform preliminary investigations for diagnostic purpose including an ECG machine. It also has a laptop and 2 android tablets for data collection and the data can be tracked real-time on the CM CORE dashboard. The van also has essential drugs and consumable that are supplied by the Government of Andhra Pradesh.

The patient flow process

The mobile medical units visit a particular village based on a defined schedule, assigned by the program manager beforehand. Every village has a designated place for the camps to be set up. The camp has five different counters numbered sequentially for the patients' convenience and ease of patient flow. At counter one, beneficiaries' registration, sociodemographic profile data collection, and generation of unique identification is done. At the second counter, a nurse checks and records the vitals, anthropometric, medical history, and chief complaints. At the third counter, the beneficiaries' medical examination is done, and the medical doctor takes clinical history. Then the doctor can send the patient to either counter four where the lab assistant can do an array of lab investigations or at counter five, where the pharmacist can dispense prescribed medicines, depending upon the case clinical requirement. The beneficiaries who need secondary or tertiary care are referred to nearby government facilities.

The following figure depicts the routine service flow of Mobile Medical Units on any particular day.

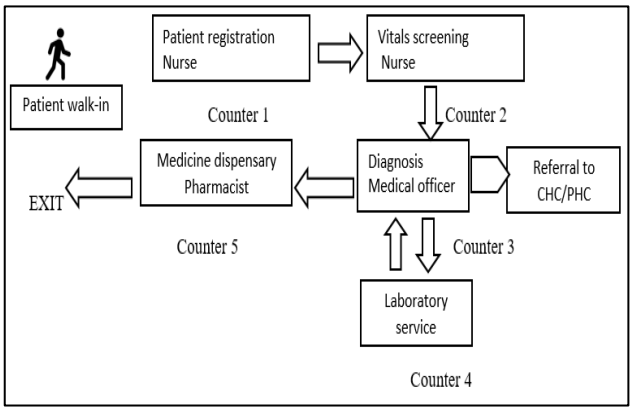

Figure 1: Patient flow.

Study design

The study was a cross-sectional community-based quantitative in nature, it was conducted during October 2016 to October 2018 among 1108 beneficiaries of 13 districts in Andhra Pradesh.

Sampling

The beneficiaries are selected through a multi-stage sampling procedure. Total number of functional MMU in Andhra Pradesh was 277. At the first stage we selected 15% of the total MMU through random sampling and obtained 41 MMUs. Each MMU visit 35 service sites, and the total sample of service sites calculated as 1435. At stage 2 of sampling, we selected 5% of the total service sites through random sampling. The sample obtained was 72 service sites. Fifteen beneficiaries were interviewed from each service area through purposive sampling to obtain a mix of beneficiaries availed services for hypertension (HTN), diabetes mellitus (DM), general medicine (Others), and antenatal care (ANC). Therefore, the total study sample obtained is 1080 beneficiaries. The researcher excluded mentally and terminally ill patients, children below 14 years, and geriatric patients >80 years of age from the study.

Data collection methods

Face to face exit interviews of the MMU beneficiaries is done for data collection. The interview schedule prepared in the local language was used to capture the data. The first part of the survey interview schedule collected socio-demographic information of the beneficiaries such as age, religion, caste, gender, level of education, occupation, and family income. The second part contained eight questions pertinent to providing the required information, treating beneficiaries with respect and dignity, and other general items that assess beneficiary satisfaction with MMUs. Piramal Swasthya Research formed a team of field investigators, and they were trained on the data collection process. The team from headquarter in Hyderabad did the Monitoring of data collection for quality and completion of the data collection. The Likert scale captured responses ranging from 1-5 scores.

Data cleaning and analysis: Out of 1080 beneficiaries interviewed, 1052 people responded to the survey. Ten beneficiaries out of 1052 beneficiary were removed due to incomplete data. Data analysis is done using SPSS 20 software. We analysed the data for socio-demographic variable and satisfaction to various attributes of the MMU services. The Cronbach's alpha coefficient of the Likert scale was calculated and found as 0.925. The researcher combined the Likert scale scores and modified the responses into strongly agree/agree, neutral, and disagree. (1-3 scores).

Ethical consideration

The primary author took the ethical permission for conducting the research study from the Institutional ethical committee of Piramal swasthya management and research institute. Preceding the data collection, the data collectors explained to each beneficiary the purpose of data collection. Verbal and written informed consent were taken before beginning the interview. Investigator has maintained the confidentiality and anonymity of the respondent's data. Access to hard and soft data is limited to the investigator, and all personal identifiers are removed before sharing it within the analytical team.

RESULTS

In this present study, the beneficiary response rate was 95.3%. Table 1 illustrates the socio-demographic characteristics of the study population.

Table 1: Socio-economic status of beneficiaries.

Variable (n=1042)	Respondents (%)
Age (years)	
18-35	226 (22)
36-45	72 (7)
46-60	346 (33)
>60	398 (38)
Religion	
Hindu	932 (89)
Christian	86 (8)
Muslim	24 (2)
Caste	
General	210 (20)
OBC	724 (70)
ST	108 (10)
Gender	
Male	290 (28)
Female	752 (72)
Education	
Illiterate	579 (56)
Primary	181 (17)
High school	184 (18)
Intermediate and above	89 (9)
NA	9 (1)
Occupation	
Employed	536 (51)
Unemployed	481 (46)
NA	25 (2)
Family income	
<5000	597 (57)
5000-10000	315 (30)
11000-20000	81 (8)
21000-30000	10 (1)
>30000	13 (1)
NA	26 (3)
Patient category	
Hypertension	434 (42)
Diabetes mellitus	344 (33)
ANC	181 (17)
Others	222 (21)

A significant percentage (38%) of the respondents were above 60 years of age. Women's participation in the program is high, as 72% of the respondents were females. Around 56% of the respondents were illiterates, and 46%

were unemployed. Most of the beneficiaries (70%) were from other backward classes. A significant percentage (57%) of the respondent's monthly family income was less than 5000 rupees, which shows that the MMU beneficiaries are socio-economically backward. A whooping Forty-two percent of the beneficiaries had hypertension, thirty-three percent diabetes, seventeen percent of them were ANC beneficiaries, and the rest approached the MMU for other complaints, including minor illnesses.

Beneficiary satisfaction

In the survey, the beneficiaries were asked eight questions based on MMU services' and responses were recorded using a Likert scale. The internal consistency of the Likert scale, measured as Cronbach's alpha, was 0.925, implying high internal consistency of the questions in the scale.[16] Most of the participants (95%) found satisfied with the MMUs services. The majority of the participants strongly agree or agree with all questions asked. Table 2 shows the details of the responses recorded for beneficiary satisfaction with MMUs service.

Table 2: Beneficiary satisfaction with MMU service.

Item (n=1042)	Strongly agree/agree N (%)	Neutral N (%)	Disagree N (%)
It is easy to find the place where 104 services offered	990 (95)	2 (0.2)	2 (0.2)
104 gave me time to express	989 (95)	4 (0.4)	1 (0.1)
104 provide complete information regarding my disease	978 (94)	10 (1)	6 (0.6)
104 has all medicines which doctor prescribed	976 (94)	15 (1.4)	3 (0.3)
I will come back to 104 in the future	988 (95)	5 (0.5)	1 (0.1)
I would like to recommend MMU to others	989 (95)	5 (0.5)	0 (0)
104 providers didn't ask money for the services	991 (95)	3 (0.3)	0 (0)
Overall, I am satisfied with the services of 104 van	986 (95)	7 (0.7)	1 (0.1)

DISCUSSION

Our study found that 95% of the beneficiaries are overall satisfied with the MMUs services. This finding is concurrence with the study conducted in Srikakulam, Andhra Pradesh, that states 94.8% beneficiary satisfaction with MMUs.[17] Most of the beneficiaries (95%) admitted that they would come back to the mobile medical units in the future; the recall value to services is a good proxy for good quality of the mobile health service delivery model in addressing community needs. Our result is in complete agreement with a similar study conducted in the United States of America states that mobile health services respond dynamically to the increasing community needs to improve health outcomes.[18] The satisfaction scores reflect the extent to which the program beneficiaries endorsed mobile health services. This outcome is in complete alignment with the study having similar settings, states, beneficiaries are pleased with MMUs and are willing to utilise the services in the future.[19] A study from Nigeria, affirms 100% of the beneficiaries are satisfied with MMU's services, but users' privacy experience scored a meagre (12.6%) satisfaction rate.[20] However, our study displayed a similar satisfaction score with the eight attributes analysed.

The affordability of medicines is a critical indicator of healthcare accessibility.[21] People who are poor cannot bear the cost of medicines. According to estimates, the burden of impoverishment in India is mainly caused by household expenditure on medications; it accounted for over three-fourth of all medical impoverishment.[8] The MMUs model tries to resolve this issue by providing free medicines to all end-users. In our study, 94% of beneficiaries admit that the MMU has all medicine prescribed by the doctor, and 95% of the users accept that all the services provided are free of cost.

Many studies quoted that satisfaction scores impact different outcomes like medication compliance and adherence to doctor-recommended follow-ups.[22,23] Literature on satisfaction on health services by the geriatric population says that the patient's perceptions of physician quality play a significant role in predicting satisfaction scores.[24] Thus, we can consider a high satisfaction rate with mobile health services as a proxy indicator for quality health care services.

Previous literature indicates that mobile health services successfully reduce barriers in accessing healthcare by reaching the high risk and stigmatised population.[25] Our study supports this finding as 57% of our beneficiaries are economically vulnerable (family income <5000 per month), and 56% are illiterate. Participation of above sixty years of age (38%), women (72%), and unemployed (46%) were significant. The above results strongly support that mobile health services reduce health disparities; and also argued higher utilisation and satisfaction by the socio-economically vulnerable population as a proxy indicator of mobile medical health acceptability and accessibility.

There are very few studies in India that estimate beneficiary's satisfaction and perceptions about MMUs. This makes our study relevant as it fills a critical knowledge gap in understanding the beneficiary's satisfaction with MMU in rural India. It is crucial to

evaluate the program from the beneficiary's perspective to understand the program's community acceptance. It further helps the program managers to modify the program for better outcomes and replication. The large sample of the study makes the results more generalizable.

Despite these strengths, our study also has limitations. We didn't estimate the region-wise (rural tribal and hard to reach) beneficiary satisfaction with the mobile medical units services due to overwhelming homogeneity in beneficiary satisfaction. Also, we couldn't correlate the satisfaction rate with socio-demographic factors and disease categories. These are the main limitations of our study.

As the next step, we suggest studies that explore the patients' health outcomes in similar settings. Additionally, the cost-effectiveness of MMUs should be explored systematically to assist in building evidence to justify the inclusion of mobile health services in the existing primary healthcare system of the country.

CONCLUSION

Mobile health services in rural areas are effective in meeting the beneficiaries' expectations. High beneficiary satisfaction and trust in mobile health services strongly favour such services in other rural geographies. A mobile medical unit can be an alternative to reach the last mile.

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