SHORT ARTICLE

Mobile Medical Units: An alternate Pathway to address the burden of Non Communicable disease in Urban Slums of India

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Citation

Article Cycle

Abstract

Background: In India despite the increase in health coverage, a small but significant proportion of people in several parts of the country still do not get access to health care services. Mobile Medical Units (MMUs) are a key service strategy to reach such vulnerable population. The present study intends to know the socio-demographic profile of population attending the MMU and the prevalence of Non-Communicable disease (NCD) among them. **Materials and Methods**: The MMU are located at five different locations in two states. The MMU is equipped to provide primary health care services, essential lab investigations, medications and counselling. The secondary data of beneficiaries attending the MMU during March 2018 to March 2019 was analysed. **Results**: A total of 84,239 beneficiaries attended the MMU, which comprised of 39 % males and 61% females. There were 55,934 beneficiaries aged 30 years and above. Out of these majority (62.6%) were females and 44.4% beneficiaries were aged between 30 to 45 years. The prevalence of Diabetes and Hypertension among the beneficiaries above 30 years of age was 38.8% and 46.2%respectively. **Conclusion**: MMU can help in delivering quality health services to the vulnerable population and help early diagnosis of NCD.

Keywords

Introduction

India's health-care system encounters one of the most challenging task of addressing the needs of the most vulnerable population. Amid lack of an adequate health care infrastructure to address the health care needs, it is critical to find alternatives to deliver basic primary care health services to all. Despite improvement in coverage, reaching hard to reach areas remains a challenge. (1) To address this problem, use of Mobile Medical Units (MMU) to deliver primary care in rural and underserved areas appears to be a relevant alternative. (2)

Usually rural population migrate to cities and settle in urban slums. The transition results in lifestyle modifications which are risk factors for various NCD. (3) Piramal Swasthya Management and Research

Institute, a not for profit organization, through one of its projects provides primary healthcare services to the residents of urban slums where the public health services are either non-existent or weak.

Aims & Objectives

1. To know the socio-demographic profile of population attending the MMU.
2. To estimate the prevalence of Non-Communicable disease (NCD) among the residents of Urban Slums.

Material & Methods

Study Type: Cross sectional study based on secondary data of the project. The study used de-identified secondary data of the MMU from March 2018 to March 2019.

Study Population: Under this Corporate social responsibility Project in collaboration with Ujjivan Financial Services Limited there were five Mobile Medical Units (MMU) in two states, Karnataka and Maharasthra at five locations in Bangalore (two locations), Mumbai, Pune and Nasik. 22 urban slums at each location which lacked or had limited access to health care facilities were identified and MMU visited these service points every month. The MMU comprised of a doctor, nurse, pharmacist and a pilot (driver). The MMU provided primary health care services, essential laboratory investigations and medications free of cost to people residing in urban slums.

The patient details were maintained as electronic medical records and patients were informed that the data can be used for secondary research purpose before entering their information in application.

Inclusion Criteria: All registered patients with age equal to or greater than 30 years were considered in the study. **Exclusion Criteria:** Incomplete entries were excluded.

Ethical Approval: The study was approved by the Institutional Ethical Committee of the Organization.

Data Analysis: For the purpose of analysis, MS excel was used. Chi-Square test was used to determine association between the variables.

Working Definition: Variables which were considered for analysis include, respondent's current age (30-45, 46-60,>= 61 years); sex (male, female); Body Mass Index (Kg/M2)Blood pressure (systolic & diastolic); random blood sugar; alcohol intake; smoking status.

Based on random blood sugar reading respondents were divided into normal Blood sugar (<=199mg/dl),

and Blood sugar in Diabetes range (>=200mg/dl). (4) Self-reported cases of diabetes were added to diabetes category. Based on Blood Pressure measurements hypertension was divided into normal (systolic <120 & diastolic <80), pre-hypertensive (systolic 120-139 or diastolic 80-89) and hypertensive (systolic >=140 or diastolic >=90). (5) Self-reported hypertension was added to hypertensive category.

Based on height and weight measurements BMI was calculated and divided into underweight (<18.5 kg/m2), normal (18.5kg/m2-22.9kg/m2), overweight (23.0kg/m2-24.9kg/m2) and obese (>=25kg/m2) categories. (6)

Results

During the period of one year, a total of 84,239 beneficiaries were provided services through these five MMUs, out of which 55,934 patients were over the age of 30 years and hence included in the study. Of these, 62.6% were females and 37.4% were males. Majority of the beneficiaries (44.4%) were in the age group of 30 to 45 years.

The prevalence of hypertension was 46.2%. From (Table 1), it can be seen that hypertension status was significantly associated with factors like gender, age-group, body mass index, and alcohol and tobacco intake. Hypertension was more prevalent in males (39.2%) as compared to females (35.1%). The prevalence of hypertension was found to increase with increasing age. Also prevalence of hypertension was high among study subjects who were overweight and obese.

A total of 21568 beneficiaries were tested for RBS out of which 38.8% had Diabetes. From (Table 2), it can be seen that the Diabetes status was found to be significantly associated with (p<0.05) age-group, body mass index, tobacco and alcohol intake. Prevalence of having diabetes was more (48.1%) among the beneficiaries aged 46 to 60 years when compared to other age groups. Majority of the study subjects who were using tobacco in any form had diabetes (62.8%) when compared to non-tobacco users (37.7%). Similarly, majority of individuals with alcohol consumption had diabetes (47.1%).

Discussion

The quality of life in urban slums is quite challenging; as the standard of hygiene and living conditions are often compromised due to poverty and illiteracy. In addition to communicable diseases it has been seen that NCDs like diabetes and hypertension are on the

rise in slum areas due to lifestyle changes.(7) The diabetes prevalence in our study is high as compared to various studies from urban slums.(8,9) It may be due to the age group taken which is above 30 years; as with increasing age there are higher chances of having diabetes. The study shows that individuals who were underweight were equally prone to diabetes as obese Higher prevalence of hypertension in slums is also being seen.(10) In our study, the prevalence of hypertension was high among obese individuals. Observations from our study highlight that urban slums have high prevalence of NCD and their risk factors and there is a strong need for proper healthcare system to identify NCD at the earliest as these areas are more likely to be neglected.

It can be seen from our study that people from urban slums are having high prevalence of both diabetes and hypertension and providing primary health care services through MMUs can be an alternative for achieving universal health care in these areas. Keeping in mind the epidemiological transition and high likelihood of these areas to be burdened by NCDs, MMUs can provide health services to the vulnerable population residing in the urban slums close to their door steps. Literature provides evidence that MMUs are of great importance in providing free medical services with laboratory diagnostic facilities.(2) Our study reinforces the importance of MMUs in achieving universal coverage by enabling health care delivery to the neglected population of urban slums. They also help in early diagnosis of NCDs, thereby preventing complications.

Conclusion

Out of 55,934 patients aged 30 years and above, 62.6% were females and 37.4% were males. Majority of the beneficiaries (44.4%) were in the age group of 30 to 45 years. The prevalence of Hypertension and Diabetes was 46.2% and 38.8% respectively. The NCD status was significantly associated with factors like age-group, body mass index, and alcohol and tobacco intake.

Recommendation

Mobile Medical Units support in addressing the inequity and achieving universal health coverage in areas like urban slums where basic health facilities are not available. MMUs could be the potential alternative in delivering quality health services to the vulnerable population and helping with early diagnosis of Non-communicable diseases.

Relevance of the study

The study provides information on the emerging epidemic of NCDs in urban slums, the prevailing risk factors and burden of NCD regarding which there is limited literature available. Our study shows a high prevalence of NCD by screening of individuals aged 30 years and above which otherwise would have gone undetected and reinforces the need for alternatives like MMU to reach the unreached and support early diagnosis.

Authors Contribution

All the authors have contributed significantly to the study.

Acknowledgement

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Tables

TABLE 1 ASSOCIATION OF HYPERTENSION STATUS WITH SOCIO-DEMOGRAPHIC AND ANTHROPOMETRIC MEASURES.

Variables	Hypertension status N (%)			χ2	p-value
	Normal	Pre-Hypertensive	Hypertensive		
Gender					
Female	4810 (21.4)	7883 (35.1)	9797 (43.5)	410.72	<0.001
Male	1484 (10.4)	5581 (39.2)	7181 (50.4)		
Transgender	3 (0.0)	0 (0.0)	4 (0.0)		
Total	6295 (17.1)	13466 (36.7)	16982 (46.2)		
Age-Groups					
30-45	3626 (23.7)	6462 (42.3)	5186 (34.0)	1800	<0.001
46-60	1944 (14.0)	4598 (33.2)	7327 (52.8)		
>=61	725 (9.5)	2406 (31.6)	4469 (58.9)		
Total	6295 (17.1)	13466 (36.7)	16982 (46.2)		
BMI					
Underweight	553 (16.1)	1817 (52.9)	1065 (31.0)	2000	<0.001
Normal	2604 (23.2)	4336 (38.6)	4302 (32.2)		
Overweight	664 (11.8)	2042 (36.3)	2923 (51.9)		
Obese	2423 (15.2)	4965 (31.2)	8546 (55.6)		
Total	6244 (17.2)	13160 (36.3)	16836 (46.5)		
Tobacco intake status					
Tobacco usage in any form	303 (23.9)	485 (38.5)	477 (37.7)	38.64	<0.001
Not taking tobacco	5990 (16.9)	12976 (36.6)	16503 (46.5)		
Total	6293 (17.1)	13461 (36.6)	16980 (46.2)		
Alcohol status					
Alcohol intake	84 (12.0)	296 (42.3)	320 (45.7)	13.82	<0.001
Not taking alcohol	6202 (17.3)	13099 (36.5)	16587 (46.2)		
Total	6286 (17.2)	13395 (36.6)	16907 (46.2)		

TABLE 2 ASSOCIATION OF DIABETES STATUS WITH SOCIO-DEMOGRAPHIC AND ANTHROPOMETRIC MEASURES.

Variable	Normal	Diabetes	χ2	P value
Gender				
Female	7735 (61.6)	4819 (38.4)	3.55	0.169
Male	5458 (60.6)	3550 (39.4)		
Transgender	5 (83.3)	1 (16.7)		
Total	13,198 (61.2)	8370 (38.8)		
Age-Groups				
30-45	5461 (75.9)	1730 (24.1)	1000	<0.001
46-60	4940 (51.9)	4573 (48.1)		

>=61	2797 (57.5)	2067 (42.5)		
Total	13,198 (61.2)	8370 (38.8)		
BMI				
Underweight	1023 (57.9)	743 (42.1)	99.5	<0.001
Normal	3858 (59.9)	2585 (40.1)		
Overweight	2101 (69.1)	939 (30.9)		
Obese	6051 (59.9)	4048 (40.1)		
Total	13033 (61.0)	8315 (39.0)		
Tobacco intake status				
Tobacco usage in any form	351 (37.2)	592 (62.8)	239.8	<0.001
Not taking tobacco	12847 (62.3)	7778 (37.7)		
Total	13198 (61.2)	8370 (38.8)		
Alcohol status				
Alcohol intake	238 (52.9)	212 (47.1)	20.44	<0.001
Not taking alcohol	12900 (61.3)	8139 (38.7)		
Total	13138 (61.2)	8351 (38.9)		