Prevalence of lifestyle diseases in Maharashtra: A comparison between NFHS-5 and NFHS-4 surveys

Maya Vikas Kshirsagar, Madhura Dhananjay Ashturkar

Department of Community Medicine, MIMER Medical College, Talegaon Dabhade, India

Abstract

Background: Lifestyle diseases are non-communicable diseases (NCDs) of long duration and slow progression and are result of combination of genetic, physiological, environmental and behavioural factors. NCDs kill approximately 41 million people (71% of global deaths) worldwide each year, which includes 14 million premature deaths aged between 30 and 70 years. Aim: The aim of this study is to compare prevalence of obesity, diabetes and hypertension in Maharashtra as per NFHS-4 (2015-16) and NFHS-5 survey (2019-20). Methods: This study was based on the data from the fifth round of National Family Health Survey (NFHS-5) and fourth round of National Family Health Survey (NFHS-4) for the state of Maharashtra. NFHS-5 survey for Maharashtra was conducted from 19 June 2019 to 30 December 2019. Results: Prevalence of Diabetes was observed as 12.4% among women and 13.6% among men, prevalence of hypertension was observed 23.1% among women and 24.4% among men and prevalence of increased Waist Hip ratio was seen 44.5% among women and 40.7% among men. Conclusion: It has been noted that the lifestyle diseases are on the rise as compared with the last decade. The policy makers should focus all these diseases as the need of the hour.

Keywords: Diabetes, hypertension, lifestyle diseases, obesity

Introduction

Lifestyle disease is a medical condition or disorder regarded as being associated with way in which person lives, such as heart disease and obesity.[1] Lifestyle diseases are ailments that are primarily based on the day-to-day habits of people. Habits that detract people from activity and push them toward a sedentary routine can cause a number of health issues that can lead to chronic non-communicable diseases (NCDs) that can have near life-threatening consequences.[2] Lifestyle diseases are NCDs of long duration and slow progression and are result of combination of genetic, physiological, environmental and behavioural factors. NCDs kill approximately 41 million people (71% of global deaths) worldwide each year, which includes 14 million premature deaths aged between 30 and 70 years. According to World Health Organization (WHO), projections of total number of deaths from NCDs will increase to 55 million deaths by the year 2030.[3]

In India, total number of deaths reported due to NCDs was 63% in year 2016, and out of which 23% deaths were premature. As per 2016 NCDs report of WHO, prevalence of obesity was found to be 4%, diabetes 8% and raised blood pressure 24% among adults in India.[4] As per Ministry of Health and Family Welfare (MOHFW), there is increase in contribution of NCDs from 30% of total diseases burden Disability Adjusted Life Years (DALYs) in 1990 to 55% in year 2016 and increase in proportion of deaths from 37% in year 1990 to 62% in year 2016. Physical inactivity, unhealthy diets, stress, tobacco use and harmful use of alcohol are major behavioural risk factors for lifestyle diseases.[3]

Worldwide obesity has nearly tripled since 1975. As per WHO Report 2016, 13% were obese and 39% overweight among adults aged more than 18 years.[5] Global prevalence of diabetes rose from
4.7% in 1980 to 8.5% in 2014 among adults aged more than 18 years. Diabetes prevalence has been rising more rapidly in low- and middle-income countries and there was a 5% increase in premature mortality from diabetes between 2000 and 2016. An estimated 1.13 billion people worldwide have hypertension out of which two-third population is living in low- and middle-income countries.

Changes in the lifestyle and timely interventions are helpful to prevent morbidity and mortality associated with these lifestyle diseases. It is need of the hour to focus on lifestyle diseases to reduce future burden on health care facilities and reduce morbidity and mortality due to NCDs. The primary healthcare approach is helpful for early detection and timely treatment of lifestyle diseases interventions. Role of Family Physicians is important for non-pharmacological management (diet, exercise, stress management, etc.) of lifestyle diseases like diabetes and hypertension. So, the prevalence of lifestyle diseases like obesity, diabetes, and hypertension among adults as per NFHS-5 and NFHS-4 survey in Maharashtra was compared to know the current situation of these diseases. The district wise prevalence of obesity, diabetes, and hypertension among adults in Maharashtra as per NFHS-5 Survey was analysed.

Material and Methods

This study was based on the data from the fifth round of National Family Health Survey (NFHS-5) and fourth round of National Family Health Survey (NFHS-4). The study was based on secondary data analysis. NFHS-5 and NFHS-4 were conducted by the Ministry of Health and Family Welfare, coordinated by the International Institute for Population Sciences, Mumbai and implemented by a group of survey organizations and Population Research Centres, selected following a rigorous selection procedure. NFHS-5 survey for Maharashtra was conducted from 19 June 2019 to 30 December 2019, whereas NFHS-4 survey was conducted from 1 April 2015 to 25 September 2015. The survey was carried out across all 29 states and 7 union territories (UTs) in India and it is representative of national, state and district wise population. The study is based on secondary data available in public domain of NFHS 4 and NFHS 5 survey with no identifiable information on the participants and can be freely accessed from NFHS website. The ethical approval for NFHS 4 and NFHS 5 surveys are obtained from ethics review board of the International Institute of Population Sciences, Mumbai, India. These surveys are reviewed and approved by the International Review Board. Informed written consent for participation in this survey is obtained from the respondent during the survey.

NFHS adopted a 2-stage stratified random sampling approach by selecting primary sampling units (PSUs) (villages in rural areas and census enumeration blocks in urban areas) with probability proportional to population size at the first stage and subsequently, picking the same number of households from each of selected PSUs through systematic random sampling. Both male and female interviewers were recruited by field agencies to interview respondents.

Information was collected from 31,643 households, 33,755 women, and 5,497 men in NFHS-5 Survey. Whereas in NFHS-4 Survey, information was gathered from 26,890 households, 29,460 women, and 4,497 men in Maharashtra. The National Family Health Survey 2019–20 (NFHS-5) and NFHS-4 survey provides information on population, health and nutrition and many important indicators for India and each state/UT. The scope of clinical, anthropometric and biochemical testing has been expanded in NFHS-5 survey to include measurement of waist and hip circumferences, and the age range for the measurement of blood pressure and blood glucose. The information was gathered by four Survey Schedules Household, Woman, Man, and Biomarker in local languages using Computer Assisted Personal Interviewing. Among these, the Biomarker Schedule covered measurements of height, weight, waist and hip circumference, and blood pressure and random blood glucose levels for women and men age 15 years and over. The study was based on data which is available in public domain and can be accessed by everyone. Available data set with no identifiable information on the survey participants.

Results

In NFHS-5 survey, information was gathered from 31,643 households, 33,755 women and 5,497 men, while in NFHS-4 Survey, information was gathered from 26,890 households, 29,460 women and 4,497 men in Maharashtra.

BMI in urban area is reduced from NFHS-4 to NFHS-5 survey for both women (32.4% to 29.6%) to men (31.2% to 28.9%), while BMI is increased in percentage in rural area. There is not much difference in BMI for total Maharashtra among women and men [Table 1].

| BMI | NFHS-5 | NFHS-4 |
|-----|--------|--------|
|     | Urban  | Rural  | Total | Urban  | Rural  | Total |
| ≥25 women | 29.6 | 18.3 | 23.4 | 32.4 | 14.6 | 23.4 |
| ≥25 men | 28.9 | 21.3 | 24.7 | 31.2 | 16.4 | 23.8 |

Table 2: Percentage of women and men population with raised blood sugar level in Maharashtra

| BSL | NFHS-5 | NFHS-4 |
|-----|--------|--------|
|     | Urban  | Rural  | Total | Urban  | Rural  | Total |
| Men |        |        |        |        |        |        |
| >140 | 7     | 6.2   | 6.5   | 6.5   | 5.4   | 5.9   |
| >160 | 6.8   | 5.2   | 5.9   | 2.6   | 2.4   | 2.5   |
| Women |        |        |        |        |        |        |
| >140 | 6.2   | 5.2   | 5.7   | 5.7   | 4.4   | 5     |
| >160 | 6.5   | 4.5   | 5.4   | 2.7   | 1.8   | 2.3   |
Table 2 shows that there is an increase from 5% to 5.7% in the Blood sugar level (BSL) >140 mg/dl and 2.3% to 5.4% >160 mg/dl among women and from 5.9% to 6.5% in BSL >140 mg/dl and 2.5% to 5.9% >160 mg/dl among men from NFHS-4 to NFHS-5 survey. This rising trend is observed both in urban and rural area.

Table 3 shows that there is an increase from 7.1% to 13.7% and 1.4% to 5%, respectively. It was observed that percentage of mild and moderate hypertension among men, from 11.5% to 16% and 3.6% to 5.3%, respectively. Mild hypertension was increased in urban and rural area by almost double points.

Table 4 shows prevalence of diabetes is 14.6% in urban and 10.7% in rural area among women, while 15.3% in urban area and 12.4% in rural area among men. Prevalence of hypertension is 23.1% among women and 24.4% among men.

Table 5 shows percentage of women and men with increased waist hip ratio in urban and rural areas of Maharashtra. Prevalence of increased waist hip ratio is more in urban (51.5%) among women and (43.2%) men as compared with rural area (38.65% and 38.7%).

Blood sugar level—high or very high (>140 mg/dl) or taking medicine to control blood sugar level among men and women were observed maximum in Sindhudurg (23.4% men and 20.6% women) followed by Mumbai Suburban (21% men and 19.7% women) and Mumbai (18.2% men and 17.5% women) districts. Whereas, minimum was observed in Buldhana (9%) and Washim (9.1%) districts among men and Gadchiroli (7.3%) and Gondiya (7.9%) districts among women.

Table 3: Percentage of women and men population with hypertension in Maharashtra

| Hypertension | NFHS-5 | NFHS-4 |
|--------------|--------|--------|
|              | Urban  | Rural  | Total | Urban  | Rural  | Total |
| Men          |        |        |       |        |        |       |
| Mild         | 16.8   | 15.4   | 16    | 12.1   | 11     | 11.5  |
| Moderate     | 5      | 5.5    | 5.3   | 4.4    | 2.7    | 3.6   |
| Women        |        |        |       |        |        |       |
| Mild         | 14.1   | 13.4   | 13.7  | 7.6    | 6.6    | 7.1   |
| Moderate     | 4.4    | 3.5    | 5     | 1.4    | 1.4    | 1.4   |

Table 4: Prevalence of BSL >140 mg/dl or on medicines and BP 140/90 mm of Hg or on medicines among population of Maharashtra (NFHS-5)

| BSL >140 mg/dl on medicine | Urban | Rural | Total |
|----------------------------|-------|-------|-------|
| Women                      | 14.6  | 10.7  | 12.4  |
| Men                        | 15.3  | 12.4  | 13.6  |
| HTN >140/90 or on medicines|       |       |       |
| Women                      | 23.8  | 22.6  | 23.1  |
| Men                        | 25.7  | 23.5  | 24.4  |

Table 5: Percentage women and men with increased waist hip ratio in urban and rural area of Maharashtra

| Waist Hip ratio | Urban | Rural | Total |
|-----------------|-------|-------|-------|
| Women ≥0.85     | 51.5  | 38.6  | 44.5  |
| Men ≥0.90       | 43.2  | 38.7  | 40.7  |

Waist Hip ratio among women was observed highest in Thane (62.2%) followed by Palghar (61.9%), Sindhudurg (61.4%), Raigarh (59.3%), Mumbai suburban (58.3%), and least in Washim (18%) and Jalna (21.4%) districts.

Blood sugar level—high or very high (>140 mg/dl) or taking medicine to control blood sugar level among men and women were observed maximum in Sindhudurg (23.4% men and 20.6% women) followed by Mumbai Suburban (21% men and 19.7% women) and Mumbai (18.2% men and 17.5% women) districts. Whereas, minimum was observed in Buldhana (9%) and Washim (9.1%) districts among men and Gadchiroli (7.3%) and Gondiya (7.9%) districts among women.

Table 3: Percentage of women and men population with hypertension in Maharashtra

| Hypertension | NFHS-5 | NFHS-4 |
|--------------|--------|--------|
|              | Urban  | Rural  | Total | Urban  | Rural  | Total |
| Men          |        |        |       |        |        |       |
| Mild         | 16.8   | 15.4   | 16    | 12.1   | 11     | 11.5  |
| Moderate     | 5      | 5.5    | 5.3   | 4.4    | 2.7    | 3.6   |
| Women        |        |        |       |        |        |       |
| Mild         | 14.1   | 13.4   | 13.7  | 7.6    | 6.6    | 7.1   |
| Moderate     | 4.4    | 3.5    | 5     | 1.4    | 1.4    | 1.4   |

Table 4: Prevalence of BSL >140 mg/dl or on medicines and BP 140/90 mm of Hg or on medicines among population of Maharashtra (NFHS-5)

| BSL >140 mg/dl on medicine | Urban | Rural | Total |
|----------------------------|-------|-------|-------|
| Women                      | 14.6  | 10.7  | 12.4  |
| Men                        | 15.3  | 12.4  | 13.6  |
| HTN >140/90 or on medicines|       |       |       |
| Women                      | 23.8  | 22.6  | 23.1  |
| Men                        | 25.7  | 23.5  | 24.4  |

Table 5: Percentage women and men with increased waist hip ratio in urban and rural area of Maharashtra

| Waist Hip ratio | Urban | Rural | Total |
|-----------------|-------|-------|-------|
| Women ≥0.85     | 51.5  | 38.6  | 44.5  |
| Men ≥0.90       | 43.2  | 38.7  | 40.7  |

Elevated blood pressure (Systolic ≥140 mm of Hg and/or Diastolic ≥90 mm of Hg) or taking medicine to control blood pressure was observed higher among both men and women in Sindhudurg (37.9% and 36.6%), Ratnagiri (33.9% and 32.4%) and Kolhapur (33.2% and 31%) districts and lower was observed in Gadchiroli (17.2%) and Wardha (14%) districts among men and Nanded (16.7%) and Gadchiroli (17%) districts among women.

Table 3: Percentage of women and men population with hypertension in Maharashtra

| Hypertension | NFHS-5 | NFHS-4 |
|--------------|--------|--------|
|              | Urban  | Rural  | Total | Urban  | Rural  | Total |
| Men          |        |        |       |        |        |       |
| Mild         | 16.8   | 15.4   | 16    | 12.1   | 11     | 11.5  |
| Moderate     | 5      | 5.5    | 5.3   | 4.4    | 2.7    | 3.6   |
| Women        |        |        |       |        |        |       |
| Mild         | 14.1   | 13.4   | 13.7  | 7.6    | 6.6    | 7.1   |
| Moderate     | 4.4    | 3.5    | 5     | 1.4    | 1.4    | 1.4   |

Table 4: Prevalence of BSL >140 mg/dl or on medicines and BP 140/90 mm of Hg or on medicines among population of Maharashtra (NFHS-5)

| BSL >140 mg/dl on medicine | Urban | Rural | Total |
|----------------------------|-------|-------|-------|
| Women                      | 14.6  | 10.7  | 12.4  |
| Men                        | 15.3  | 12.4  | 13.6  |
| HTN >140/90 or on medicines|       |       |       |
| Women                      | 23.8  | 22.6  | 23.1  |
| Men                        | 25.7  | 23.5  | 24.4  |

Table 5: Percentage women and men with increased waist hip ratio in urban and rural area of Maharashtra

| Waist Hip ratio | Urban | Rural | Total |
|-----------------|-------|-------|-------|
| Women ≥0.85     | 51.5  | 38.6  | 44.5  |
| Men ≥0.90       | 43.2  | 38.7  | 40.7  |

Discussion

This study was focused on the prevalence of lifestyle diseases like obesity, diabetes and hypertension among adults in Maharashtra. It was observed that there is rising trends for obesity, diabetes and hypertension from NFHS-4 to NFHS-5 survey in Maharashtra.

BMI in urban area was reduced from NFHS-4 to NFHS-5 survey for both women (32.4% to 29.6%) and men (31.2% to 28.9%), while increased BMI was found in rural women, that is, 14.6% to 18.3% and 18.4% to 21.3% among men. It was also observed that prevalence of increased waist hip ratio was 51.5% among urban women and 43.2% urban men as compared with rural area (38.6% and 38.7%).
19% were men and 23.9% women and prevalence of obesity is 4.7% out of which 3.1% men and 6.5% women. In another study carried out by Nagarkar et al., overweight was found to be 38.9% and obesity 21.2% in urban slum area.

There was increase in the BSL. Random >140 mg/dl (5% to 5.7%) and >160 mg/dl (2.3% to 5.4%) among women. It was also observed that BSL Random >140 mg/dl increased from 5.9% to 6.5% and BSL >160 mg/dl (2.5% to 5.9%) among men in NFHS-5 survey as compared with NFHS-4 survey. The rise was also observed in BSLR >140 (5.4% to 6.2% among men and 4.4% to 5.2% among women) and BSLR >160 (2.4% to 5.2% among men and 1.8% to 4.5% among women) in rural population. This rise may be due to changing lifestyle and urbanization.

As per NFHS-5 survey, prevalence of BSL Random >140 mg/dl or on medicines was observed 12.4% among women and 13.6% among men, that is, total prevalence was 13% among the total population and 15% of urban population in Maharashtra. Similar findings were observed in a meta-analysis carried by Ransinghe et al. which has shown that prevalence of diabetes in rural and urban India was 15% and 19%, respectively, during years 2015–2019 and highest (24%) was in Tamil Nadu. It was rising trend of diabetes or increase in blood sugar level (12.4% among males and 10.8% among females) as per LASI study. ICMR multicentric study showed prevalence of DM in Mumbai was 9.3%. The other study carried out by Nathan S et al. showed prevalence of DM in India 11%, that is, second highest in SEAR countries.

Prevalence of lifestyle diseases like obesity, diabetes and hypertension are rising over period, so timely interventions are required to reduce the morbidity and mortality associated with these diseases.

**Conclusion**

It has been noted that the lifestyle diseases like obesity, diabetes and hypertension are on rise as compared with last decade. The policy makers should focus all these diseases as the need of the hour. The lifestyle diseases need to be screened and controlled at primary health care as these diseases have complications in future lives and lot of burden on health care facilities. Comprehensive care facilities including primary prevention, health awareness, screening, early diagnosis and treatment and management of complications are required to beat the burden of lifestyles diseases at state and national level.

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**Conflicts of interest**

There are no conflicts of interest.

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