



# Overweight and obesity prevalence among Indian women by place of residence and socio-economic status: Contrasting patterns from 'underweight states' and 'overweight states' of India



Angan Sengupta<sup>a, b, \*</sup>, Federica Angeli<sup>c</sup>, Thelakkat S. Syamala<sup>d</sup>, Pieter C. Dagnelie<sup>e</sup>, C.P. van Schayck<sup>f</sup>

<sup>a</sup> Health Services Research, CAPHRI, Maastricht University, The Netherlands

<sup>b</sup> Institute of Health Management Research, Bangalore, India

<sup>c</sup> Department of Health Services Research, CAPHRI, Maastricht University, Duboisdomein 30, 6229 GT, Maastricht, The Netherlands

<sup>d</sup> Population Research Centre, Institute for Social and Economic Change, V.K.R.V. Rao Road, Nagarbhavi, 560072, Bangalore, India

<sup>e</sup> Department of Nutritional Epidemiology, Faculty of Health, Medicine and Life Sciences, CAPHRI, Maastricht University, Debyeplein 1, 6229 HA, Maastricht, The Netherlands

<sup>f</sup> Department of General Practice, Faculty of Health, Medicine and Life Sciences, CAPHRI, Maastricht University, Debyeplein 1, 6229 HA, Maastricht, The Netherlands

## ARTICLE INFO

### Article history:

Available online 9 June 2015

### Keywords:

India  
Overweight  
Obesity  
Underweight states  
Overweight states  
Nutrition transition

## ABSTRACT

Evidence from developing countries demonstrates a mixed relationship of overweight/obesity with socioeconomic status (SES) and place of residence. Theory of nutrition transition suggests that over the course of development, overweight first emerges among rich and urban people before spreading among rural and poor people. India is currently experiencing a rapid rise in the proportion of overweight and obese population especially among adult women. Under the backdrop of huge socio-economic heterogeneity across the states of India, the inter-state scenario of overweight and obesity differs considerably. Hence, this paper investigates the evolution over time of overweight and obesity among ever-married Indian women (15–49 years) from selected 'underweight states' (Bihar, Orissa and Madhya Pradesh, where underweight proportion is predominant) and 'overweight states' (Kerala, Delhi and Punjab, where overweight is the prime concern), in relation to a few selected socio-economic and demographic indicators. This study analysed National Family Health Surveys- NFHS-2 (1998–99) and NFHS-3 (2005–06) following Asian population specific BMI cut-offs for overweight and obesity. The results confirm that within India itself the relationship of overweight and obesity with place of residence and SES cannot be generalized. Results from 'overweight states' show that the overweight problem has started expanding from urban and well-off women to the poor and rural people, while the rural-urban and rich-poor difference has disappeared. On the other hand in 'underweight states' overweight and obesity have remained socially segregated and increasing strongly among urban and richer section of the population. The rate of rise of overweight and obesity has been higher in rural areas of 'OW states' and in urban areas of 'UW states'. Indian policymakers thus need to design state-specific approaches to arrest the rapid growth of overweight and its penetration especially towards under-privileged section of the society.

© 2015 Elsevier Ltd. All rights reserved.

## 1. Introduction

Undernutrition and related issues have remained very important part of Indian policies. However, recent studies suggest that the proportion of overweight among adult women is on a steep rise in India. According to National Family Health Surveys (NFHS-2 and NFHS-3), percentage of overweight women among those who are currently married has increased from 10.6% to 14.4% between

\* Corresponding author. Institute of Health Management Research, #319, Hulimangala, Near Thimma Reddy Layout, Electronic City-I, Hulimangala Post, Bangalore 560105, India.

E-mail addresses: [angan.and@gmail.com](mailto:angan.and@gmail.com), [angan@iihmr.org](mailto:angan@iihmr.org), [angan\\_and@rediffmail.com](mailto:angan_and@rediffmail.com) (A. Sengupta), [federica.angeli@maastrichtuniversity.nl](mailto:federica.angeli@maastrichtuniversity.nl) (F. Angeli), [syamala@isec.ac.in](mailto:syamala@isec.ac.in) (T.S. Syamala), [dagnelie@maastrichtuniversity.nl](mailto:dagnelie@maastrichtuniversity.nl) (P.C. Dagnelie), [onno.vanschayck@maastrichtuniversity.nl](mailto:onno.vanschayck@maastrichtuniversity.nl) (C.P. Schayck).

1998–99 and 2005–06. National Nutrition Monitoring Bureau (NNMB) surveys show that in rural India the prevalence of overweight/obesity ( $BMI \geq 25 \text{ kg/m}^2$ ) has increased from 3% in 1975–79 to 16% in 2011–12. There are considerable variations across Indian states in terms of the anthropometric status of people (Ackerson et al., 2008; Wang, Y. et al., 2009; Chockalingam et al., 2011). NFHS surveys show that proportion of overweight and obese people has increased in almost all states, but the rise has not been uniform. In a few states, alongside successful eradication of undernourishment, overweight appeared as a major public health concern during recent past. At the same time, in some other states, the problem of overweight/obesity has just begun to appear alongside an already existing high level of undernutrition (IIPS, 2000; IIPS, 2007). Following ‘Asian population specific BMI cut-offs’ ( $BMI \geq 23 \text{ kg/m}^2$ ) for overweight and obesity, in 2005–2006 eight major Indian states reported a proportion of overweight women exceeding that of underweight women, whereas in 1998–99 there were only four such states (Sengupta et al., 2014).

On a positive note, Indian socio-demographic and economic indicators have shown signs of significant improvement. As per Sample Registration System of India (2011), the Crude Death Rate has declined from 25 in 1951 to 7.2 in 2010, and Total Fertility Rate declined from 6.0 to 2.5 during these six decades. India has also experienced a sharp fall in Infant Mortality Rate from 146 per 1000 live births in 1951 to 47 in 2010.

Besides the demographic transition, studies suggest that India is currently lying between the first and second stage of a nutrition transition (Griffiths and Bentley, 2001; Shetty, 2002). The rising problem of overweight and obesity in India can be explained in tandem with the nutrition transition. According to the theory proposed by Popkin (1993), rapidly developing societies experience changes in dietary patterns and a decline in the level of physical activities among its population. Food basket transforms from more cereal and home-based foods towards more non-vegetarian, fat, sugar and salt based and ready-made foods. According to NNMB report (2012) the prevalence of overweight/obesity was significantly higher among those with high consumption levels of milk and milk products, fats and oils, sugar and salt etc. During the last three decades, the intake of coarse-cereals, fruits and vegetables have declined, while intake of fats, animal food, salt and sugars increased among Indians (Ray, 2007; Deaton and Dreze, 2009; Gaiha et al., 2010; Misra et al., 2011). Higher risk factor for obesity and cardio-vascular diseases (CVD) among urban middle aged women could be explained by higher income and education, consumption of dietary fat and low physical activity (Pandey et al., 2013). The existence of considerable regional differences in India, in terms of socio-economic factors, cultural practices and dietary intakes, also influences the anthropometric status of the population (Shetty, 2002).

Levels of overweight and obesity across low- and middle-income countries have approached levels found in higher-income countries (Popkin and Slining, 2013). Cross-country evidences mainly from the developing nations suggest that the rise in overweight appears first among the people from more developed regions and well-to-do sections of society. In developed parts of the world overweight is prevalent among people with low socio-economic profile, while in low- and middle-income countries the problem exists mainly among the rich and urban population. However, overweight/obesity in many low- and middle-income countries can no longer be attributed as a problem of urban and wealthier sections (Popkin and Gordon-Larsen, 2004; Mendez et al., 2005; Porterico et al., 2011; Jones-Smith et al., 2012; Razak et al., 2013; Gakidou et al., 2014). In India the problem of overweight has been concentrated mainly among urban and wealthier classes (Subramanian and Smith, 2006; Subramanian et al., 2009;

Garg et al., 2010; Sengupta and Syamala, 2012). Nevertheless, recently overweight and related morbidities are also appearing within rural and poorer segments (Reddy et al., 2007).

Due to huge variation in overweight scenario and the related factors across Indian states the relationship of overweight and obesity with place of residence and socioeconomic status (SES) cannot be generalized. In particular, how overweight patterns have evolved over time is still unclear. This study investigates the paradigm shift between 1999 and 2006 in the existence of overweight and obesity among ever-married women aged 15–49 years, by place of residence and socio-economic status. Indian states, that are characterized either by highest or lowest burden of overweight/obesity, were selected for this study.

## 2. Methods

### 2.1. Data and sample

Data for this study are drawn from the National Family Health Survey (NFHS)-2 (1998–99) and NFHS-3 (2005–06). NFHS-2 collected information on 89,199 ever-married women aged 15–49 years, whereas the next edition of the survey included never-married women (total 124,385) from the same age group. Since, NFHS-2 survey did not gather information on never-married women, our study focused only upon the ever-married women. There were total 26 states during NFHS-2 and 29 states during NFHS-3. Three states namely Jharkhand, Chhattisgarh and Uttaranchal were formed in 2001. We have selected specific states for our analysis based on the proportion of underweight and overweight/obesity among ever-married women across Indian states (Jharkhand, Chhattisgarh and Uttaranchal were not considered). Kerala, Punjab and Delhi have been classified as ‘Overweight states (‘OW states’). According to NFHS-2 and NFHS-3, these states are characterized by highest proportions of overweight/obesity and lowest prevalence of underweight among ever-married women. On the other hand, we have selected Bihar, Orissa and Madhya Pradesh as ‘Underweight states (‘UW states’)’ since people from these states traditionally struggle over the problems related to undernutrition (highest during NFHS-3). At the same time, they demonstrate lowest prevalence of overweight women.

Random sampling techniques were adopted in both rounds of NFHS. For NFHS-2 and -3, respectively the 1991 and 2001 Census lists served as sampling frames. Rural samples were selected from the census list of villages, while the urban sample selection was done using the list of urban wards. The urban and rural samples within each state were drawn separately and allocated proportionally to the size of the state’s urban and rural populations. In each state, the rural sample was selected in two stages. At the first stage villages were selected as primary sampling units (PSUs), with a probability proportional to population size (PPS). This was followed by the random selection of households within each PSU in the second stage. In urban areas, a three-stage procedure was followed. In the first stage, wards were selected with PPS sampling. In the next stage, one census enumeration block (CEB) was randomly selected from each sample ward. In the final stage, households were randomly selected within each selected CEB (IIPS, 2007).

### 2.2. Measures

#### 2.2.1. Outcome

The nutritional status of adults, which is our dependent variable, is given in terms of the Body Mass Index (BMI). BMI of an individual is calculated as weight in kilograms divided by height in metres squared ( $\text{kg/m}^2$ ). A solar-powered scale was used to measure weight with accuracy to the nearest 0.1 kg and height was

Download English Version:

<https://daneshyari.com/en/article/7332207>

Download Persian Version:

<https://daneshyari.com/article/7332207>

[Daneshyari.com](https://daneshyari.com)