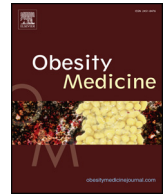




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## Social network body size is associated with body size norms of South Asian adults



Nicola Lancki<sup>a</sup>, Juned Siddique<sup>b</sup>, John A. Schneider<sup>c</sup>, Alka M. Kanaya<sup>d</sup>, Kayo Fujimoto<sup>e</sup>, Swapna S. Dave<sup>a</sup>, Ankita Puri-Taneja<sup>a</sup>, Namratha R. Kandula<sup>a,b,\*</sup>

<sup>a</sup> Feinberg School of Medicine, Division of General Internal Medicine, Northwestern University, 750 N Lake Shore Drive, Chicago, IL, 60611, United States

<sup>b</sup> Feinberg School of Medicine, Department of Preventive Medicine, Northwestern University, 420 E Superior, Chicago, IL, 60611, United States

<sup>c</sup> Department of Medicine and Public Health Sciences and the Chicago Center for HIV Elimination, University of Chicago, 5837 S. Maryland Ave, Chicago, IL, 60637, United States

<sup>d</sup> Division of General Internal Medicine, University of California San Francisco, 1545 Divisadero, San Francisco, CA, 94115, United States

<sup>e</sup> Division of Health Promotion & Behavioral Sciences, School of Public Health, University of Texas Health Science Center at Houston, Houston, TX, United States

## ARTICLE INFO

## Keywords:

Obesity  
Body size norms  
Social network influence  
South Asian American  
Cardiovascular risk

## ABSTRACT

**Aims:** To examine the association between social network body size and body size norms in South Asian adults.  
**Methods:** Participants (n = 766) from the Mediators of Atherosclerosis in South Asians Living in America (MASALA) study (2014–2018) provided detailed information about their five closest network members. Participants' perceptions of their network members' body sizes, their own body size (self-body size), and a healthy body size for men and women (body size norms) were assessed using the Stunkard 9-figure scale. Adjusted hierarchical linear regression models were used to examine associations between the average body size of network members and perceived body size norms.

**Results:** Participants' average age was 59.1 years (SD = 9.2) and 44.1% were women. Participants reported an average network body size of 4.0 (SD = 1.1). The average body size norm for male and female Stunkard images was 3.6 (SD = 1.0) and 3.4 (SD = 0.8), respectively. Social network body size was positively associated with increasing body size norms ( $\beta$ -coefficient = 0.31, 95% CI: 0.26, 0.36), independent of self-body size.

**Discussion:** Social networks may influence body size norms in South Asian adults. Long-term follow up of the MASALA cohort will determine if social network body size and body size norms are associated with weight-control behaviors and weight change.

### 1. Introduction

Obesity is a major public health problem in the United States (U.S.). South Asians (individuals from India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan, and Maldives) are the second fastest growing racial/ethnic group in the United States (U.S. Census Bureau, 2010), and they are at increased risk of obesity-related conditions, such as diabetes mellitus and coronary heart disease. South Asians have a higher prevalence of obesity compared to most other Asian groups (Holland et al., 2011; Joshi et al., 2007; Karter et al., 2013). Furthermore, cardiometabolic risk increases at a significantly lower body mass index in South Asians as compared to other racial/ethnic groups (Gujral et al., 2017; WHO expert consultation, 2004). Very little is known about the determinants of weight in South Asian immigrants; a better understanding

of the environmental, interpersonal, and individual factors that influence weight is necessary to strengthen obesity prevention efforts in an increasingly diverse U.S. population.

Previous research suggests that obesity clusters in social networks and that individual risk of becoming obese increases if network members become obese (Christakis and Fowler, 2007; Hruschka et al., 2011), although there are debates in their statistical approach (VanderWeele et al., 2012; Lyons, 2011). One of the proposed mechanisms of social influence on weight is through shared norms; group norms may influence individual perceptions of a healthy body size and related behaviors (Koehly and Loscalzo, 2009; Leahey et al., 2015). Social network members may also serve as role models for an individual and lead them to eat or exercise differently to approximate that ideal (Cutting et al., 1999). Population-level studies from the U.S. have found

\* Corresponding author. 420 E. Superior Street, 6th Floor, Northwestern University, Chicago, IL 60611, United States.

E-mail addresses: [nicola.lancki@northwestern.edu](mailto:nicola.lancki@northwestern.edu) (N. Lancki), [siddique@northwestern.edu](mailto:siddique@northwestern.edu) (J. Siddique), [jschneil@medicine.bsd.uchicago.edu](mailto:jschneil@medicine.bsd.uchicago.edu) (J.A. Schneider), [alka.kanaya@ucsf.edu](mailto:alka.kanaya@ucsf.edu) (A.M. Kanaya), [kayo.fujimoto@uth.tmc.edu](mailto:kayo.fujimoto@uth.tmc.edu) (K. Fujimoto), [swapna-dave@northwestern.edu](mailto:swapna-dave@northwestern.edu) (S.S. Dave), [ankita.puri@northwestern.edu](mailto:ankita.puri@northwestern.edu) (A. Puri-Taneja), [nkandula@nm.org](mailto:nkandula@nm.org) (N.R. Kandula).

<https://doi.org/10.1016/j.obmed.2018.06.001>

Received 7 June 2018; Accepted 22 June 2018

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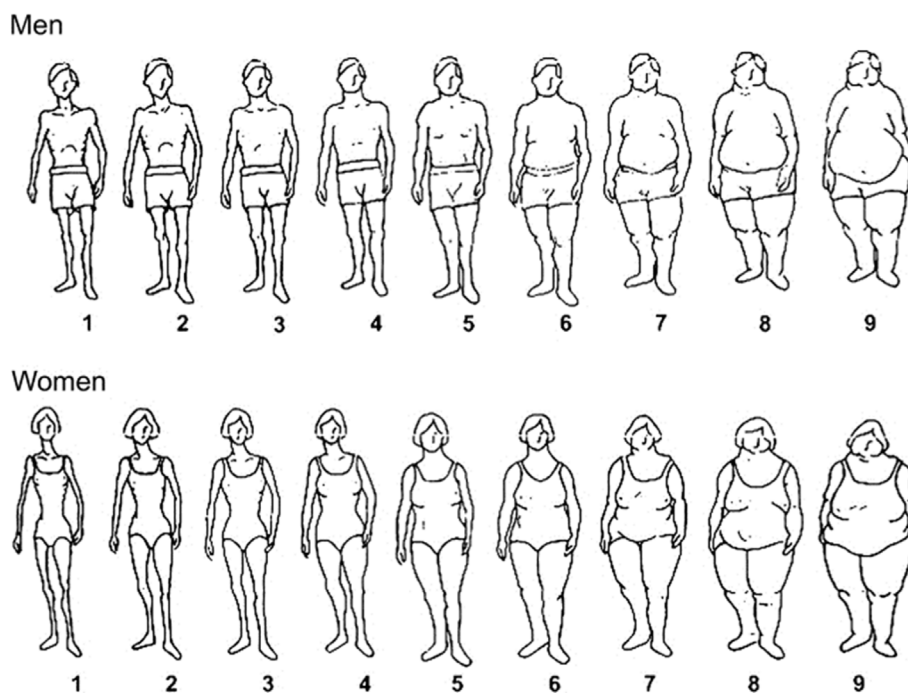


Fig. 1. Stunkard Figure Rating Scale for Men and Women. Reprinted with permission from *The Genetics of Neurological and Psychiatric Disorders* Copyright 1983, Raven Press (Stunkard et al., 1983).

that norms around appropriate body weight have trended upward over the past 25 years, concurrent with a similar shift in population body weight (Burke et al., 2010; Chandler-Laney et al., 2009; Winston et al., 2015a). In addition to social influence, culture shapes perceptions of body weight and health. The vast majority of South Asians in the U.S. are immigrants, whose cultural values may also shape conceptualizations of a healthy body weight. Effective treatment and prevention of obesity and related co-morbidities in South Asians requires recognition and understanding of the social and cultural aspects of weight. To our knowledge, no studies have examined social influences on body size norms in South Asians living in the U.S.

The primary objective of this study was to examine associations of social networks with body size norms among South Asian adults who participated in the Mediators of Atherosclerosis in South Asians Living in America (MASALA) study. For the purpose of this analysis, we defined an individual's social network as the set of people with whom they "discuss important matters." This definition is consistent with what has been used in other nationally representative surveys to define a personal network with potential for social influence (Cornwell et al., 2009). We hypothesized that the average perceived body size of network members would be positively associated with body size norms, independent of cultural factors.

## 2. Materials and methods

### 2.1. Setting and study population

The Mediators of Atherosclerosis in South Asians Living in America (MASALA) Study is a community-based cohort of South Asians. The study recruitment, methods and baseline measurements have been published previously (Kanaya et al., 2013). Briefly, using surname-based recruitment methods, a community-based sample of 906 South Asians was recruited between October 2010 and March 2013 from the San Francisco Bay Area and in Chicago and surrounding suburbs. To be eligible for the baseline MASALA exam, participants had to self-report South Asian ethnicity, be between the ages of 40–84 years, and be able to speak and/or read English, Hindi or Urdu. Exclusion criteria included

a physician diagnosed heart attack, stroke or transient ischemic attack, heart failure, angina, use of nitroglycerin, a history of cardiovascular procedures, current atrial fibrillation, active treatment for cancer, life expectancy < 5 years due to a serious medical illness, impaired cognitive ability, plans to move out of the study region in the next 5 years, living in a nursing home or on a waiting list, and weight > 300 pounds. The study protocol and procedures were approved by two institutional review boards and all study participants signed informed consent.

From 2014 to 2018, MASALA study participants were re-enrolled for a 2nd study visit where personal network characteristics were measured using an egocentric approach that examined the network members (alters) reported by the respondent (ego). The social network measurement methods have been described previously (Kandula et al., 2018). Briefly, for the social network visit, participants were asked to enumerate relevant alters by using a name generator; interviewers asked participants to list the people with whom they discuss "important matters." This name generator was selected to identify network "confidants" who have opportunities to exert social influence and normative pressure and with whom the participant may exchange information or advice regarding health, diet, physical activity, and weight. Participants were asked to provide further, detailed information on social, cultural and health-related questions for the first five confidants who were named.

### 2.2. Measures

Participants' sex, age, and other socio-demographic characteristics were collected at the baseline interview (2010–2013). Social network, body norm data, cultural characteristics, and clinical measures were collected from participants at the social network visit (2014–2018). Participant BMI was calculated based on height measurements from the baseline visit and weight measurements from the social network visit. For a small number of participants missing weight measurements at the social network visit, values from the baseline visit were used to calculate BMI.

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