

High degree of BMI misclassification of Malnutrition among Swedish Elderly Population: Age-adjusted height estimation using Knee Height and Demi-span

Nivetha Natarajan Gavriilidou

Abstract

The grade of misclassification of obesity and underneath nutrition amongst elders due to imprecise height capacities is examined using height projected by knee height (KH) and demi-span equations. Cross-sectional scrutiny was completed amidst an off-the-cuff heterogeneous sample from five municipalities in Southern Sweden from a general population study 'Good Aging in Skåne' (GÅS). The sample comprised two groups: Group 1 (KH) including 2839 GÅS baseline participants aged 60-93 years with a valid KH measurement; and Group 2 (demi-span) including 2871 GÅS follow-up examination participants (1573 baseline; 1298 new), aged 60-99 years, with a legitimate demi-span measurement. Participation rate was 80%. Height, weight, KH and demi-span were measured. KH and demi-span equations were formulated using rectilinear regression analysis among participants aged 60-64 years as reference. Body mass index (BMI) was calculated in kg/m².

MATERIALS AND METHODS

Study population: A cross-sectional study was conducted among participants aged ≥ 60 years during a longitudinal, randomized, general population-based study called 'Good Aging in Skåne' (GÅS), a part of the Swedish National Study on Aging and Care (SNAC).^{28,29} This study involves a heterogeneous sample of men and ladies from five municipalities of Scania. The National Population Registry was used to randomly invite the participants by letter. Predefined target populations were invited for the age cohorts 60, 66, 72, 78, 81, 84, 87, 90 and 93 years, with an oversampling of the youngest and therefore the oldest cohorts. The sample comprised two groups. The primary group (group 1) consisted of 2839 elderly participants (aged 60-93 years), 58% of the randomly invited general population residents who

accepted to participate within the baseline investigation of GÅS in 2001-2004 and had valid KH measurement. The second group (group 2) included 2871 participants aged 60-99 years, 1573 from baseline and 1298 new participants who took part within the follow-up examination of GÅS conducted in 2007-2010 (participation rate: 80%) and had a legitimate demispan measurement. A complete of 92 participants were excluded from group 1 and 490 from group 2 because that they had missing KH and demispan values, respectively.

Data collection: All participants were examined at a search center, except if they were frail (home visits), after consent was obtained. Survey, checkup and physical functioning tests were conducted by qualified physicians and nurses. An consent was obtained. The close ended questionnaire investigated sociodemographics, physical, psychological state and social factors. The descriptive variables included age, sex, place of birth, legal status, education, alcohol consumption, smoking habits and physical activity. These data were obtained from the survey. The legal status denoted whether the participants were single, married, divorced or living with a partner. Education was stratified as primary, secondary, higher secondary or university level. Smoking status indicated whether the participants were regular or irregular smokers or had quit smoking. Alcohol frequency included responses as 'have never drunk', 'a few times within the last year but not since last month' and 'have had alcohol a couple of times within the last month'. The degree of physical activity was investigated in terms of the degree or intensity of coaching and categorized into barely physically active ('nothing at all', 'very light activity/ mostly sedentary'), mild ('around 2-4 h a week'), moderate ('1-2 h a week'), heavy ('at least 3 h a week') and really heavy ('regularly or several times a week').

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Nivetha Natarajan Gavriilidou
Lund University, Sweden

RESULTS

There were 2839 participants in group 1 and 2871 participants in group 2, with a mean age of 71 ± 10.4 years (sex difference not significant). Group 1 comprised 44.2% men, 55.8% women, 53.6% married, 13.3% smokers, 24.4% who consumed alcohol a minimum of until last month, 8.3% who were barely physically active, 24.9% who reported moderate activity (1-2 h/week) and three .2% with but primary education. Group 2 included 44.4% men, 55.6% women, 62.4% married, 39.5% smokers, 33.2% who consumed alcohol a minimum of until last month, 6.9% who were barely physically active, 26.4% with moderate activity and 1.7% with but primary education. A sociodemographic evaluation amongst contributors and failures displayed no significant difference (results not shown). Average stature, heaviness, KH, demispan, HeightKH and Heightdemispan are shown in Table 1. Mean measured height decreases by ~6.2 cm among men and seven .8 cm among women from 60-64 to 85+ years aged. this is often calculated by the typical difference between the mean heights aged groups from 60-64 years to 85+ years in groups 1 and a couple of for men and ladies , respectively. Demispan diminutions later 70-74 years by 2.7 cm in men and 1.5 cm in women. The ratio between KH and Height and therefore the ratio between demispan and Height increase with age among women, however only demispan: Height ratio increases with age among men. Figures 1a and b demonstrates the sex-specific regression equations to estimate the anticipated body height supported KH and DS, respectively.

Women aged 85+ years have undernutrition prevalence of 21.3% by BMIKH compared with 11.3% by BMI. BMIKH estimated overall obesity prevalence is 17.5% in men and 14.6% in women and is less than BMI. Sex difference between BMI and BMIKH are often noted at different age groups. Among men, it's notable at 80-84 years aged and among women it's notable as early as 70-74 years aged (26.2% by BMI and 17.1% by BMIKH). BMIKH estimates among men aged 80-84 years (7.4%) are almost half that estimated by BMI (16.5%). At 85+ years, the BMIKH obesity prevalence is further lower (4.9%); that's , when BMI classifies 1 in 10 men as obese, it's 1 in 20 consistent with BMIKH. additionally , when 2 in 10 women aged 80-84 years are obese by BMI, just one in 10 is consistent with BMIKH. For comparison, we tried to use the Chumlea's KH equation to calculate BMIChumlea.

Under nutrition between women elderly 85+ years was 7.3% compared with 21.3% using the BMIKH and 11.3% using BMI (results not shown). BMI demispan under nutrition pervasiveness is projected to be above that by BMI. Among men, there's little or no difference in prevalence rates between the 2 methods at each group, except at the age of 65-69 years, where BMIdemispan gives higher value (2.1%) than BMI (1.5%). However, among women aged 85+ years, there's 16.5% undernutrition by BMIdemispan compared with 10% by BMI. Overall obesity prevalence estimated by BMIdemispan is less than that by BMI in both sexes. for instance , the values are as follows: 16.7% by BMI vs 10.9% by BMIdemispan among men aged 80-84 years. Midst of the women elderly 75-79 years, it is 24.6% by BMI vs 18.2% by BMIdemispan. BMI-estimated obesity prevalence is nearly twice that estimated by BMIdemispan among the participants aged 85+ years, with small or no difference in younger groups.