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**Malnutrition and obesity
among older adults,
assessed by Mini Nutritional Assessment
and the body mass index, respectively:
prevalence and associations with mortality
and urinary tract infection**

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Abstract

Introduction: Malnutrition and obesity are health concerns among older (aged ≥ 65 years) adults, but the combination of them have not been studied thoroughly nor have they been thoroughly investigated in very old (aged ≥ 85 years) adults. The aims of this thesis were to investigate the prevalence, trends in prevalence and associations with mortality of malnutrition and obesity, assessed by Mini Nutritional Assessment (MNA) and the body mass index (BMI), respectively, and to examine the combined effects of these conditions on mortality. Malnutrition as a risk factor for urinary tract infection (UTI) was also investigated.

Material and Methods: The studies reported on in papers I and II were conducted with data from the Umeå85+/Gerontological Regional Database study, a population-based study of cohorts of very old adults. Data from all four Swedish cohorts (2000–2002, 2005–2007, 2010–2012 and 2015–2017), and from the 2000–2002 and 2005–2007 Swedish cohorts and a 2005–2006 Finnish cohort, respectively, were used. In the paper I study, trends in the prevalence of malnutrition (by MNA score) and obesity (by BMI) were investigated across cohorts. In the paper II study, the associations of MNA scores and BMI with 5-year mortality were investigated. The study reported on in paper III was conducted with data from the Senior Alert national quality registry; associations of Mini Nutritional Assessment–Short Form (MNA-SF) scores, BMI and 2-year mortality in older adults living in residential care facilities in Sweden were investigated. The study reported on in paper IV was conducted with data from the Frail Older People–Activity and Nutrition and Umeå Dementia and Exercise studies; risk factors for UTI among older adults in residential care facilities were investigated.

Results: In the paper I study, mean BMI increased between 2000–2002 and 2015–2017 and the prevalence of obesity were 13.4% and 18.3%, respectively; the prevalences of underweight were 7.6% and 3.0%, respectively. Mean MNA scores increased between 2000–2002 and 2010–2012 and were slightly lower in 2015–2017. The prevalence of malnutrition according to MNA scores in the four cohorts were 12.2%, 6.4%, 5.1% and 8.7%, respectively, and the prevalence of at risk thereof were 31.8%–37.2%. In the paper II study, 13.3% of participants were malnourished, and 40.3% at risk thereof according to MNA scores, and malnutrition was more common among women than men. Twenty-five percent of the population had BMIs ≥ 28.0 kg/m². Of those with malnutrition according to MNA scores, 17.4% had BMIs ≥ 24.7 kg/m²; of those with good nutritional status according to MNA scores, 13.8% had BMIs < 22.2 kg/m². Compared to malnutrition according to MNA, lesser mortality was found in individuals with good nutritional status. Compared to individuals with BMI < 22.2 kg/m², lesser mortality was found in those with BMI ≥ 28.0 kg/m². In the paper III study, 14.6% of the population was malnourished, and 45.0% at risk of malnutrition according to MNA-SF scores and 16.0% were obese. Compared to individuals with good nutritional status, greater mortality was found in those with malnutrition according to MNA-SF. Mortality was greater among underweight than among normal-weight participants and lesser among participants with obesity, including severe obesity. Higher BMIs were also associated with reduced mortality in subgroups defined by MNA-SF scores. In the paper IV study, malnutrition according to MNA scores was not a risk factor for UTI in the whole sample or in women. In men, the MNA score was associated with UTI in univariate analysis.

Conclusions: The results of this thesis highlight the importance of nutritional screening in older adults in residential care facilities and in very old adults, since malnutrition risk was common and associated with greater mortality among these populations. Malnutrition according to MNA was not a clear risk factor for UTI in older adults living in residential care facilities. Time trends indicated an increasing prevalence of obesity whereas no change in nutritional status according to MNA was observed among very old adults, although these trends need further investigation. The results also confirmed that higher BMIs were beneficial for survival in these populations, and in the residential care population this seems to apply also for BMIs reflecting severe obesity. Finally, in the residential care population, regardless of nutritional status according to MNA-SF, higher BMIs were associated with better survival.

Keywords

Malnutrition, obesity, underweight, Mini Nutritional Assessment, Body Mass Index, older adults, very old, community dwelling, residential care facilities, mortality, urinary tract infection

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