Overweight and Obesity among Older Adults on Admission to Hospital

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Abstract
Poor nutritional status, which includes both under- and over-nutrition, is associated with poor health outcomes. This cross-sectional study assessed the nutritional status of older patients admitted to an acute geriatric ward of a Dublin hospital. Anthropometric and clinical measurements were made. Thirty patients, mean (sd) age 79 (7) y and body mass index 26.6 (4.7) kg/m
2 participated. More patients were overweight (n=12) or obese (n=9) than underweight (n=1) or healthy weight (n=8) which indicates that this age-group may be part of the Irish obesity epidemic.

Introduction
Published definitions of poor nutritional status include both under- and over-nutrition. The World Health Organization (WHO) states that in developed countries, weight and BMI gradually increase during adult life, peak at 50-59y and decline after 60y. In Ireland, 16% to 84% of older patients (>65y) were shown to be at risk of under-nutrition on admission to hospital and it is well known that under-nutrition is associated with increased susceptibility to infection and sepsis, increased risk of pressure sores, increased length of hospital stay and increased hospital cost. The prevalence of over-nutrition however, amongst the elderly on admission to hospital in Ireland is unclear. Over-nutrition is increasing in the older population and is a risk factor for type II diabetes, cardiovascular disease and cancer. The aim of the current cross-sectional study was to assess the nutritional status of older patients on admission to an acute geriatric ward of a Dublin hospital.

Methods
The study was approved by the Medical Ethics Committee of Connolly Hospital, Blanchardstown, Dublin and all patients gave verbal consent. Patients were recruited consecutively and were considered eligible if they were e65y, not under the care of a clinical nutritionist/dietitian, not on artificial nutrition support and not terminally ill. Demographic and clinical data were determined from medical notes. Actual weight was measured to the nearest 0.1 kg using a chair scales (Seca 954 digital, Hamburg, Germany). Height was indirectly calculated as the difference of an individual's recumbent knee height measured using a knee-heel caliper (Chasmors, CMS Weighing Equipment Ltd, London, UK). Body mass index (BMI) was calculated and mid upper arm circumference (MUAC) was measured. Descriptive statistical analyses and independent t-tests or Mann Whitney U-tests were used and a P-value <0.05 was statistically significant. Published definitions of poor nutritional status include both under- and over-nutrition. In Ireland, 16% to 84% of older patients (>65y) were shown to be at risk of under-nutrition on admission to hospital and it is well known that under-nutrition is associated with increased susceptibility to infection and sepsis, increased risk of pressure sores, increased length of hospital stay and increased hospital cost. The prevalence of over-nutrition however, amongst the elderly on admission to hospital in Ireland is unclear. Over-nutrition is increasing in the older population and is a risk factor for type II diabetes, cardiovascular disease and cancer. The aim of the current cross-sectional study was to assess the nutritional status of older patients on admission to an acute geriatric ward of a Dublin hospital.

Results
This 30 participant cohort consisted of 23 females with an overall mean (sd) age 79 (7)y and BMI 26.6 (4.7)kg/m
2 patients were obese, (BMI e30kg/m
2), n=12 overweight (BMI 25-29.9kg/m
2), n=8 healthy weight (BMI <18.5kg/m
2). Most BMI values fell between the 75th-95th and the 50th-75th centile ranges (n=7, n=4 respectively). Five patients had a MUAC <23.5cm while two were =25cm. Good correlation was observed between MUAC and BMI (r=0.813, P<0.001). Patients were grouped according to Malnutrition Universal Screening Tool (MUST) MUAC cutoffs for estimating BMI. A MUAC <23.5cm indicates BMI<20kg/m
2, a MUAC 23.5–32cm indicates BMI 20-30kg/m
2 and a MUAC >32cm indicates BMI >30kg/m
2. Cross-classification showed that 21 patients were classified correctly (Table 1). One patient classified as undernourished by BMI had a MUAC measurement which was =23.5cm. Nine patients were obese, (BMI e30kg/m
2), n=8 healthy weight (BMI <18.5kg/m
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Discussion
A greater number of older patients were classified as overweight and obese than underweight on admission to hospital.

As with other studies, a significant correlation was found between MUAC and BMI. It was observed however that both underweight and overweight patients were misclassified by MUAC suggesting that the MUST recommended MUAC cut-offs may not be appropriate to determine BMI, although the authors acknowledge that the patient sample size in the current study was small. MUAC does not account for abdominal obesity and the measurement of waist circumference is a useful tool to estimate this. In conclusion, in the current study there were a greater number of older patients classified as over-weight than under-nourished on admission to hospital. This may reflect the increasing prevalence of over-nutrition in this population although extrapolation of these data to the general population must be carried out with caution.

Acknowledgements
We are grateful to the staff of the acute care ward for medicine for the elderly and to Dr Patrick McCormack, Connolly Hospital, Blanchardstown, for their assistance. Thanks also go to Dr NP Kennedy and Dr C Corish for reviewing the manuscript. We declare no funding or conflict of interest associated with this study.

MUAC: mid upper arm circumference; BMI: body mass index; MUST: Malnutrition Universal Screening Tool

Table 1
<table>
<thead>
<tr>
<th>BMI Classification</th>
<th>MUAC Classification</th>
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<tr>
<td>Underweight</td>
<td>&lt;23.5cm</td>
</tr>
<tr>
<td>Healthy Weight</td>
<td>23.5–32cm</td>
</tr>
<tr>
<td>Overweight</td>
<td>&gt;32cm</td>
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