**ABSTRACT OF THE DOCTORAL DISSERTATION**

**PhD student:** Tran Chau Quyen

**Name of dissertation: *“Development and validation of height and weight estimation for hospitalized elderly from certain hospitals during the period 2018 to 2022”***

**Major:** Nutrition

**Code:** 9720401

**Academic advisors:** 1. Nghiem Nguyet Thu, MD., PhD

2. Prof. Pham Thang, MD., PhD

**Institution:** National Institute of Nutrition

**CONTENT**

**I. INTRODUCTION**

Weight and height represent fundamental criteria for nutrition care process. When elderly individuals are unable for conventional measurements, it's crucial to estimate using formulas.

The project entitled "Development and validation of height and weight estimation for hospitalized elderly from certain hospitals during the period 2018 to 2022" aim to streamline clinical processes and provide a convenient tool for medical staff with 3 main objectives:

*1. Development and validation of height estimation for hospitalized elderly from certain hospitals during the period 2018 to 2022.*

*2. 'Development and validation of weight estimation for hospitalized elderly from certain hospitals during the period 2018 to 2022.*

*3. Establish technical procedure for estimating the height and weight of elderly patients to facilitate the provision of nutritional care, utilizing formulas developed from certain hospitals during the period 2018 to 2022..*

**The novel contributions**

This study marks the first attempt to create a set of formula for height and weight estimation using anthropometric characteristics of Vietnamese elderly within hospital setting. Subsequently, this leads to the creation of lookup tables and the technical procedures for guiding the estimation of height and weight in case of elderly individuals unable to assume conventional measurements.

# **II. METHODOLOGY**

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|  | Equation development | Equation validation | Critical ill elderly validation |
| Study object | Ambulatory elderly | Ambulatory elderly | Critical ill elderly |
| Location | National Geriratric hospital Vietnam | Quy Nhon City and Khanh Hoa Province General Hospital | Intensive care center, Bach Mai hospital |
| Duration | 2018-2021 | 6 and 11/ 2021 | 8-10/2022 |
| Sample size | 518 | 298 | 26 men and 30 women |

- Study design: Cross sectional study

## - Estimate weight and height for elderly patients by lookup table

## - Establish technical procedure for estimating the height and weight of elderly patients **III. CONCLUSION**

**1. Height estimation equation**

For men:

EH1 (cm) = 1.529 x KH (cm) + 88.201 (r2 = 0.410; SEE = 5.177)

EH 2 (cm) = - 0.188 x Age + 1.440 x KH (cm) + 106.816 (r2 = 0.465; SEE = 4.949)

For women:

EH 1 (cm) = 0.657 x HL (cm) + 130.322 (r2 = 0.305; SEE = 5.454)

EH 2 (cm) = 0.410 x HL (cm) + 0.928 x KH (cm) + 97.162 (r2 = 0.434; SEE = 4.890)

EH3 (cm) = - 0.259 x Age+ 1.103 x KH (cm) + 120.292 (r2 = 0.479; SEE = 4.701)

Where: EH: estimated height (cm); HL: Humeruos lenght (cm); KH: Knee height (cm); SEE: Standard error of estimation (cm)

**2. Weight estimation equation**

For men:

EW1 (kg) = 2.379 x MAC (cm) - 8.527 (r2 = 0.616; SEE = 5.666)

EW 2 (kg) = 2.471 x CC (cm) - 24.874 (r2 = 0.580; SEE = 5.924)

EW 3 (kg) = 1.507 x MAC (cm) + 1.381 x CC (cm) - 29.401 (r2 = 0.714; SEE = 4.899)

For women:

EW 1 (kg) = 2.016 x CC (cm) - 14.419 (r2 = 0.644; SEE = 5.267)

EW 2 (kg) = 0.987 x MAC (cm) + 1.374 x CC (cm) - 20.090 (r2 = 0.720; SEE = 4.675)

Where: EW: Estimated weight; MAC: Mid arm circumference; CC: Calf circumference; SEE: Standard error of estimation (cm)

**3. The look up tables on height, weight estimation and the technical procedure for estimating the height and weight of elderly patients.**

**IV. RECOMMENDATIONS**

1. The height estimaion equations in men were EH (cm) = 1,529 x KH (cm) + 88,201 or EH (cm) = - 0.188 x Age + 1.440 x KH (cm) + 106.816; in women were EH (cm) = 0.410 x HL (cm) + 0.928 x KH (cm) + 97.162 or EH (cm) = - 0.259 x Age + 1.103 x KH (cm) + 120.292; can be applied in clinical practice.

2. The weight estimaion equations in men EW (kg) = 1.507 x MAC (cm) + 1.381 x CC (cm) - 29.401 and in women EW (kg) = 0.987 x MAC (cm) + 1.374 x CC (cm) - 20.090 can be applied in general clinical practice, but noted that the estimated results may be more prone to errors in women. However, it's advisable to restrict the use of these formulas to critically ill elderly.

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| **Academic advisor 1**  **Nghiem Nguyet Thu, MD., PhD** | **Academic advisor 2**  **Prof. Pham Thang, MD., PhD** | **PhD student**  **Tran Chau Quyen** |

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