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# Association between body mass index and patient-reported-outcome questionnaire scores (CAT<sup>TM</sup>, ACT<sup>TM</sup>, mMRC dyspnoea scale, IPAQ) in Ukraine, Kazakhstan and Azerbaijan: results of the CORE study

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## Abstract

**Background:** The overweight/obese population (evaluated by a body mass index, BMI) represents a global health problem and contributes to the development of various chronic diseases. In this epidemiological study we evaluated this relationship by analyzing patient-reported questionnaires related to respiratory function, physical activity and BMI.

**Methods:** In 2013–2015, adult residents of selected cities were enrolled to this study in: Ukraine (M/F: 403/561), Kazakhstan (M/F = 348/597) and Azerbaijan (M/F: 389/544). Height was measured using a vertical measuring board, and body weight was measured by using portable digital scales. All participants were interviewed using CAT<sup>TM</sup>, mMRC scale and IPAQ; respondents who also reported wheezing or whistling chest sounds during the previous 12 months additionally ACT<sup>TM</sup>.

**Results:** 45.4% of respondents in Ukraine, 47.6% in Kazakhstan and 54.9% of respondents in Azerbaijan were found to be overweight/obese (BMI  $\geq$  25 kg/m<sup>2</sup>). The mean CAT<sup>TM</sup> total score among this population versus those respondents with a normal weight was 5.2 versus 3.6 (Ukraine,  $p < 0.001$ ), 4.2 versus 2.9 (Kazakhstan,  $p < 0.001$ ) and 5.9 versus 4.3 (Azerbaijan,  $p < 0.001$ ). The number of respondents without airflow limitations (mMRC score 0) among overweight/obese respondents versus normal weight respondents was 298 (68.2%) versus 456 (86.7%) in Ukraine, 261 (58.1%) versus 387 (78.2%) in Kazakhstan and 343 (67.1%) versus 345 (82.3%) in Azerbaijan. The ACT<sup>TM</sup> total score between overweight/obese respondents and normal weight respondents was not statistically different. IPAQ showed a tendency towards a higher proportion of “low activity” results (compared to “moderate” and “high”) in the overweight/obese subgroup (24.7% vs. 23.8% in Kazakhstan, 18.5% vs. 14.6% in Azerbaijan), and in Ukraine this difference was significant (12.4% vs. 5.2%,  $p < 0.001$ ).

**Conclusion:** CAT<sup>TM</sup> and mMRC are widely used tools for respiratory function assessment. Despite CAT<sup>TM</sup> scores being close to a normal value ( $< 5$ ), the relationship of both CAT<sup>TM</sup> and mMRC scores with being overweight/obese was demonstrated in the general adult population of three CIS countries. IPAQ may also be a useful instrument for

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