OBJECTIVES
To document clinical associations of perceived well-being (PWB) in obese subjects

SUBJECTS AND METHODS
Prospectively collected ‘Obesity Polyclinic’ database was retrospectively analyzed for the answers to the questionnaire fulfilled during the initial evaluation for obesity. After exclusion unavailable cases, the answers to the question ‘how do you describe your general health/well-being?’ i) excellent ii) good iii) fair iv) poor v) extremely poor each were categorized, and these groups were compared for BMI per se, total body fat content, waist-hip ratio, fasting plasma glucose, HOMA-IR, LDL-C, HDL-C, TSH, anti-thyroid peroxidase, free thyroxine, hemoglobin, creatinine, transaminases, 25(OH)D, albumin levels. As a secondary analysis, the associations of the symptoms with the PWB were examined.

EXCLUSION CRITERIA: Medications with glucocorticoids or antipsychotics, Cushing syndrome, thyrotoxicosis, pillarian insufficiency, uncontrolled diabetes mellitus (requirement of insulin or oral antidiabetics other than metformin), chronic kidney diseases, rheumatic diseases, chronic liver diseases, bronchial asthma, neuromuscular diseases, psychiatric or mental retardation were excluded.

RESULTS
During the study period, who satisfied the inclusion criteria, 623 subjects (M, 69554, median 42-year-old with a BMI of 34.6 kg/m²) had completed the initial evaluation form. The distribution of answers to PWB was as 89 (14.3%) good, 269 (43.2%) fair, 229 (36.7%) poor, and 36 (5.8%) extremely poor. Nervousness, sleep disturbances, headache, depressive mood, lassitude, correlated with PWB (Table 1, 2).

The curve estimation demonstrated independent associations of increasing PWB scores with higher levels of 25(OH)D, albumin, and HDL-C, but no association with HOMA-IR or presence of metabolic syndrome or TSH or anti-thyroid peroxidase levels. Further, both 25(OH)D and albumin levels associated with the number of symptoms also (i.e. 68.8% of subjects with 25(OH)D levels ≥ 30 ng/mL had 0–1 symptom, 25.0% had 2–3 symptoms, and 6.2% had 4–5 symptoms; whereas this distribution in subjects with 25(OH)D levels ≤ 20 ng/mL was as: 33.2% had 0–1 symptom, 33.6% had 2–3 symptoms, 33.2% had 4–5 symptoms, p<0.006; similar distribution differences were observed between albumin level groups).

CONCLUSIONS
25(OH)D and albumin levels correlate with perceived general well-being scores, and the reduction of their circulating levels contributed to an increased risk of symptoms such as nervousness, sleep disturbances, headache, depressive mood, and lassitude in our representative sample of overweight/obese individuals. Moreover, these correlations persist irrespective of the presence of metabolic syndrome, thyroid autoimmunity, and thyroid function. Further longitudinal interventional studies are warranted to document the causal relationships among these public health problems.

Table 1: Characteristics of the study subjects (n=623)

Table 2: Anthropometric and laboratory comparisons of overweight/obese subjects based on their perceived general well-being

Figure 1: Distribution of the number of symptoms within groups classified according to 25(OH)D level and to albumin level (the symptoms are nervousness, sleep disturbances, headache, depressive mood, and lassitude).

Figure 2: Frequency of symptoms with a comparison among groups classified by perceived general well-being scores.

Figure 3: Distribution of the number of symptoms within groups classified according to each symptom.