

# IDENTIFICATION OF FACTORS RELATED WITH SARCOPENIC OBESITY PHENOTYPE: AN EXTENSIVE LITERATURE-BASED ANALYSES IN THE SO-NUTS EUROPEAN PROJECT

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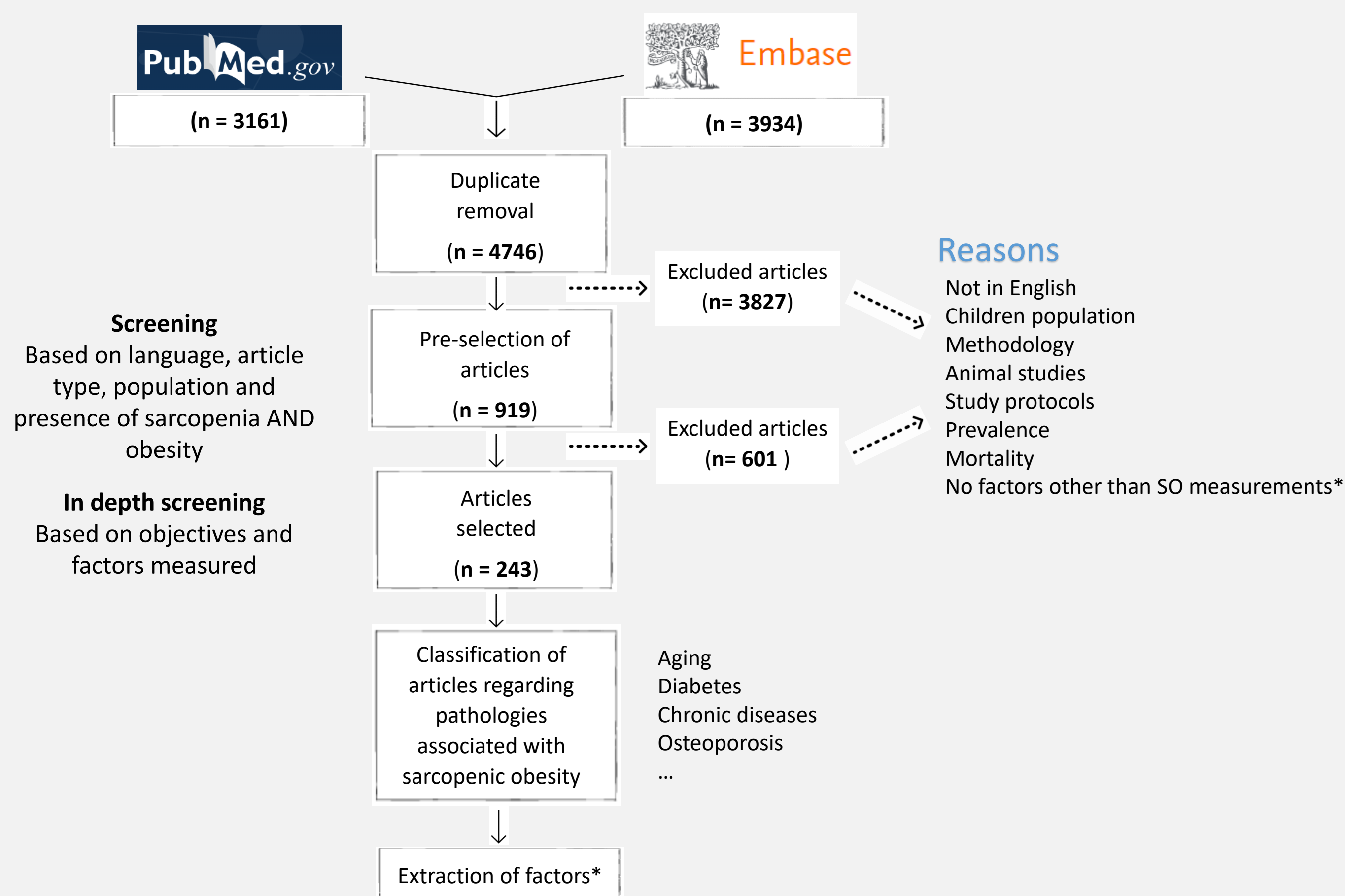
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## Introduction and objectives:

Excessive adiposity associated to reduced muscle mass & strength define sarcopenic obesity (SO) and lead to negative outcomes (Donini et al. 2022\*). A better characterization of the risk factors related to SO development will help its early diagnosis and prevention. These factors were identified in the literature and evaluated by a panel of experts.

## Materials and methods:



\*NB : Measurements of parameters focused on obesity (BMI, percent fat, ...) and sarcopenia (muscle mass, quality and function) are not considered as factors as they are already included in the definition of sarcopenic obesity (SO). We are focusing on factors associated with SO not on the definition of SO

Figure 1 : flow chart of scientific article selection for the identification of factors significantly associated with SO

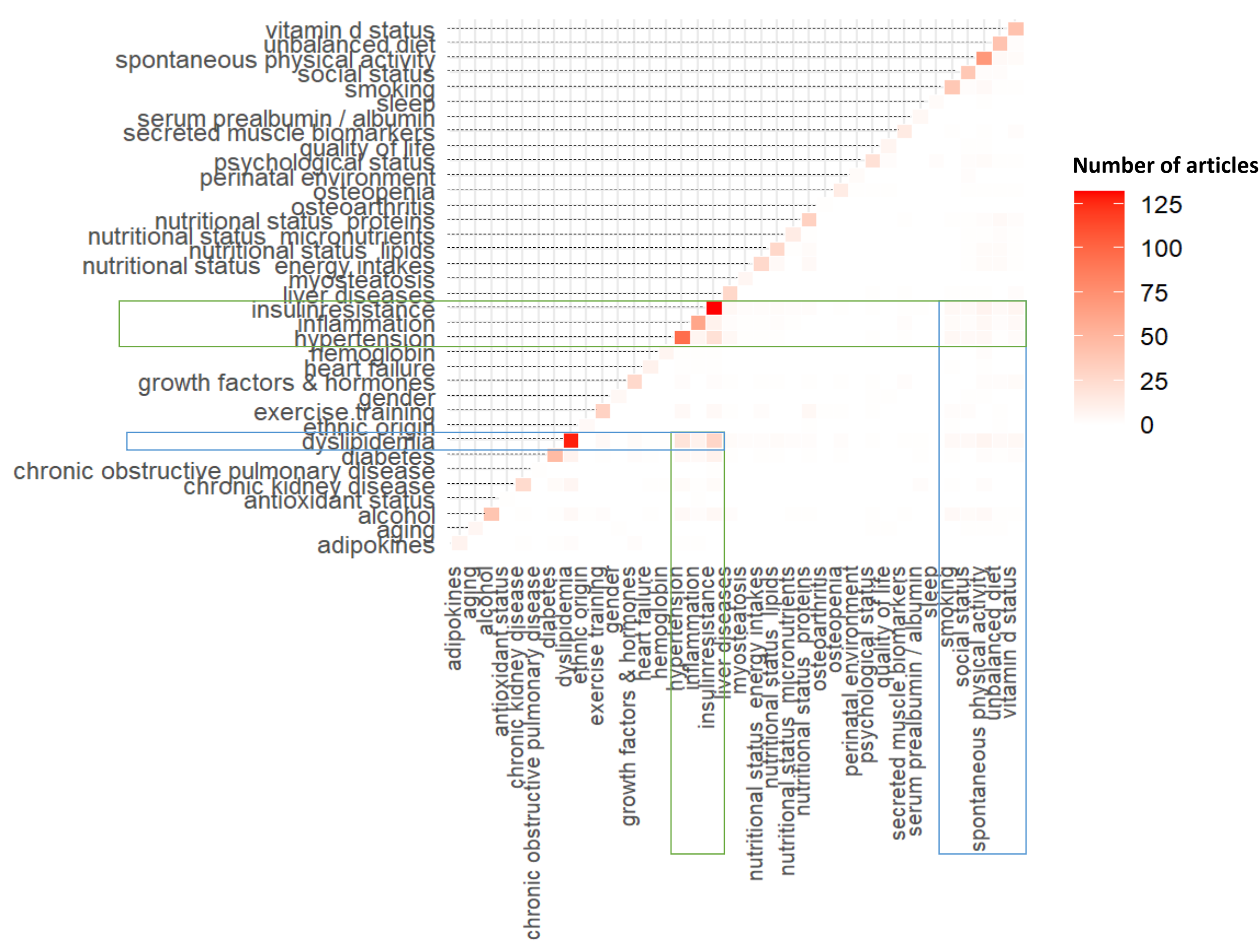


Figure 3 : double-entry matrix of significant factors commonly found in the same article  
 Based on articles where two or more significant factors were identified

Insulin resistance, inflammation and hypertension are the most commonly found factors (green boxes) and were frequently evaluated with dyslipidemia, smoking status, social status, spontaneous physical activity, unbalanced diet and vitamin D status (blue boxes).

## Results:

Table 1 : frequency of factors found significantly associated with SO

Factors identified	Frequency (%)
Insulin resistance	53 (11.62%)
Dyslipidemia	42 (9.21%)
Exercise training	31 (6.8%)
Inflammation	28 (6.14%)
Hypertension	27 (5.92%)
Spontaneous physical activity	25 (5.48%)
Diabetes	18 (3.95%)
Liver diseases	17 (3.73%)
Nutritional status - proteins	17 (3.73%)
Growth factors & hormones	16 (3.51%)
Psychological status	15 (3.29%)
Chronic kidney disease	14 (3.07%)
Vitamin D status	13 (2.85%)
Unbalanced diet	11 (2.41%)
Osteopenia	10 (2.19%)
Nutritional status - lipids	9 (1.97%)
Social status	9 (1.97%)
Alcohol	9 (1.97%)
Nutritional status - energy intakes	7 (1.54%)
Smoking	7 (1.54%)
Sleep	7 (1.54%)
Adipokines	6 (1.32%)
Osteoarthritis	6 (1.32%)
Secreted muscle biomarkers	6 (1.32%)
Cancer treatment	5 (1.1%)
Chronic obstructive pulmonary disease	5 (1.1%)
Genetic variation	5 (1.1%)
Nutritional status - micronutrients	5 (1.1%)
Aging	4 (0.88%)
Ethnic origin	4 (0.88%)
Gender	4 (0.88%)
Myosteatosis	4 (0.88%)
Heart failure	3 (0.66%)
Perinatal environment	3 (0.66%)
Quality of life	3 (0.66%)
Serum prealbumin / albumin	3 (0.66%)
Hemoglobin	2 (0.44%)
Surgery	2 (0.44%)
Antioxidant status	1 (0.22%)

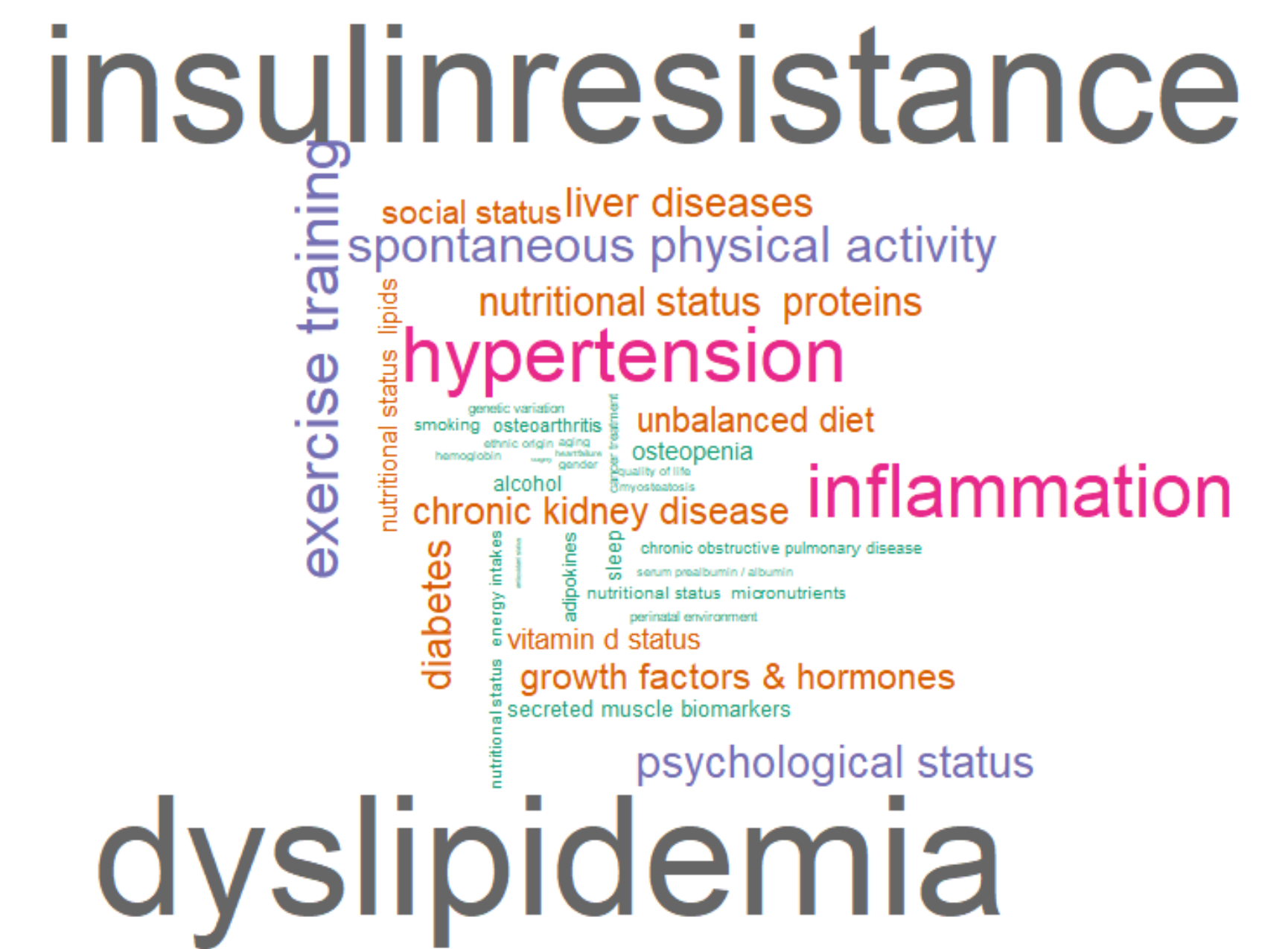


Figure 2 : word cloud illustrating the most frequent factors found significantly associated with SO

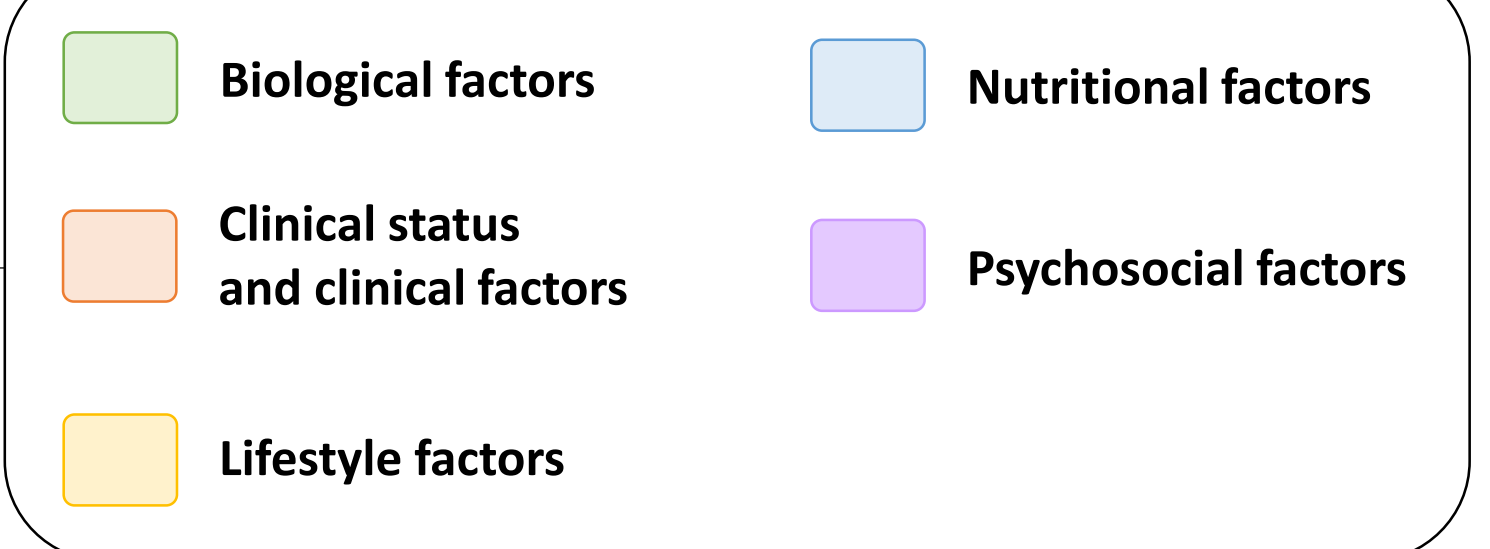


Table 2 : Evaluation of factors by experts

Factors evaluated	mean	SD	Factors evaluated	mean	SD
Spontaneous physical activity	1,416	0,458	Osteoarthritis	-0,173	0,638
Nutritional status – energy intake	1,375	0,629	Heart Failure	-0,190	0,674
Nutritional status – proteins	1,374	0,463	Liver diseases	-0,218	0,617
Exercise training	1,275	0,772	Osteopenia	-0,219	0,735
Age	1,223	0,690	Nutritional status – micronutrients	-0,223	0,593
Unbalanced diet	1,183	0,465	Glucocorticoid treatment	-0,290	0,977
Inflammation	1,060	0,406	Ethnic Origin	-0,292	0,567
Myosteatosis	0,980	0,688	Chronic obstructive pulmonary disease	-0,306	0,933
Insulin resistance	0,961	0,651	Gender	-0,308	0,805
History of weight cycling	0,718	0,610	Orthopedic surgery	-0,341	0,718
Diabetes	0,644	0,510	Oral Health	-0,355	0,706
Quality of life	0,488	0,896	Antidepressive therapies	-0,358	0,965
Growth factors & Hormones	0,364	0,567	Gut microbiota	-0,451	0,654
Vitamin D status	0,355	0,502	Surgery	-0,520	0,792
Secreted muscle biomarkers	0,184	0,789	Chronic Kidney Disease	-0,570	0,869
Post Intensive Care Unit recovery	0,129	0,861	Dyslipidemia	-0,615	0,723
Social status	0,087	0,489	Serum prealbumin / albumin	-0,673	0,748
Post COVID-19 patients	0,077	0,957	Hypertension	-0,701	0,847
Psychological status	0,069	0,558	Cushing syndrome	-0,736	0,970
Postmenopausal status	0,061	0,876	Perinatal environment	-0,855	0,944
Adipokines	0,053	0,816	Smoking	-0,900	0,567
Bariatric surgery	0,002	0,901	Alcohol	-0,973	0,856
Nutritional status – lipids	-0,038	0,756	Antioxidant status	-1,028	0,453
Sleep	-0,058	0,750	Genetic variation	-1,153	0,465
Health Literacy	-0,134	0,703	Hemoglobin	-1,251	0,888
Cancer treatment	-0,145	0,753			

Standardized normal distribution of factors according to the score obtained when evaluated by the experts (from 0, not important, to 10, very important in SO phenotype. Some of them were suggested by the experts and were not previously found in the literature

## Conclusion:

Despite some differences on the most relevant factors of SO between the analysis of the literature and the experts' evaluation, this step will help to define a solid SO phenotype and better detect predisposed subjects for tailored multimodal lifestyle interventions. The relation between the factors identified and the risk of sarcopenic obesity is evaluated in international cohorts such as the Rotterdam study (see poster O28 for more details)

Donini, L. M., Busetto, L., Bischoff, S. C. et al. Definition and Diagnostic Criteria for Sarcopenic Obesity: ESPEN and EASO Consensus Statement. Obesity Facts 2022 doi: 10.1159/000521241.