THE IMPACT OF NUTRITIONAL STATUS, LOSS OF WEIGHT OR APPETITE, DYSPHAGIA, AND MICRONUTRIENTS DEFICIENCIES ON ALL-CAUSE MORTALITY IN OLDER PATIENTS

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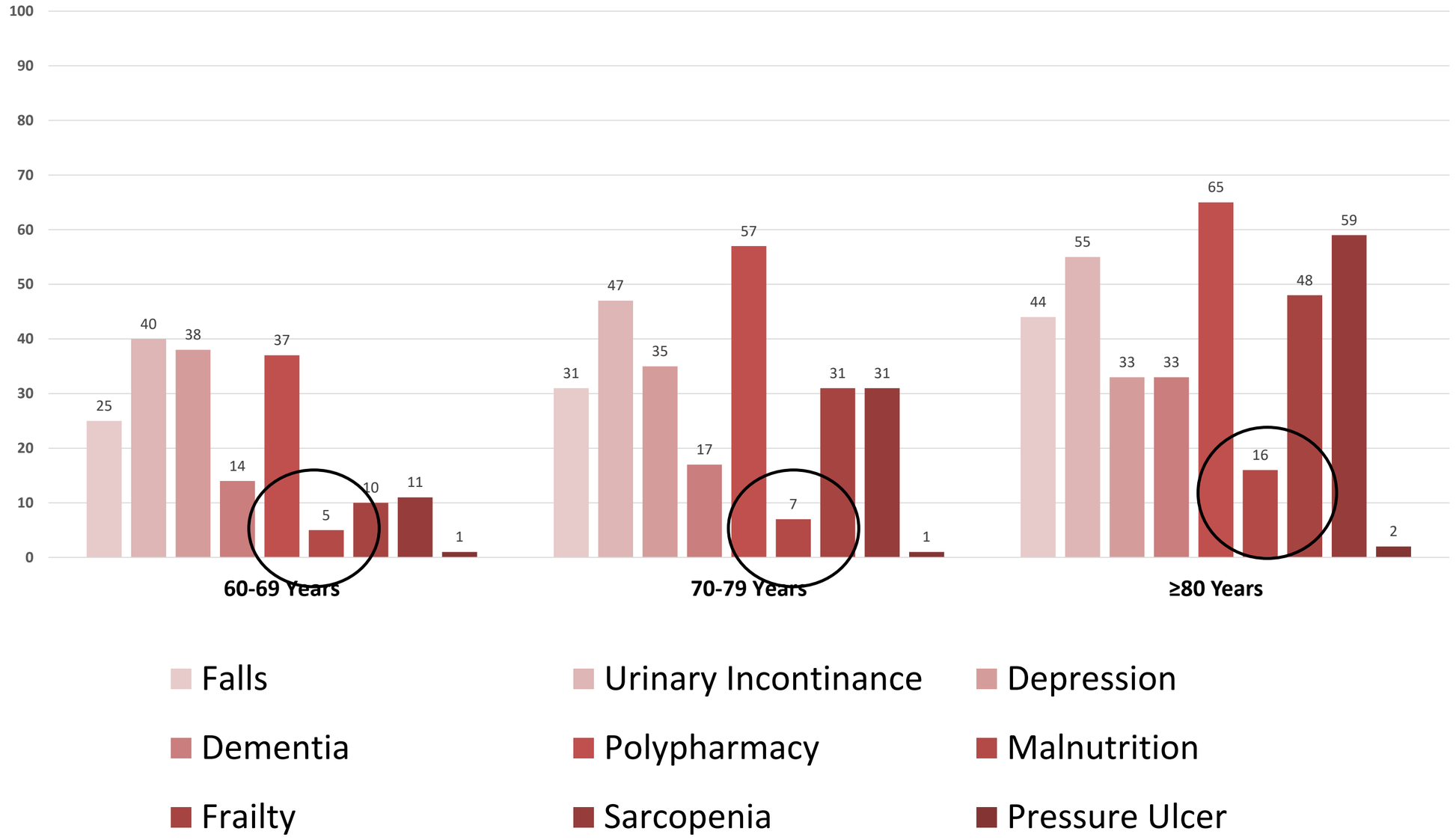
World Older Population

2015
600 million

2025
1.2 billion

2050
2 billion

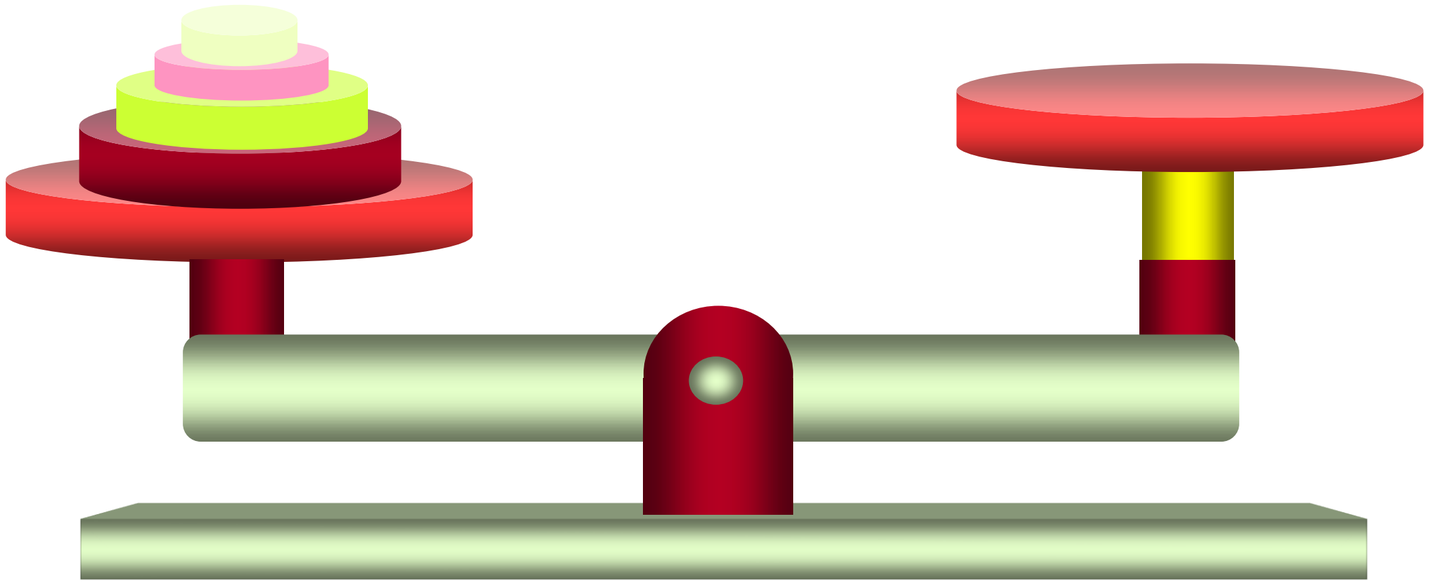
What is the geriatric syndrome?



What is malnutrition?

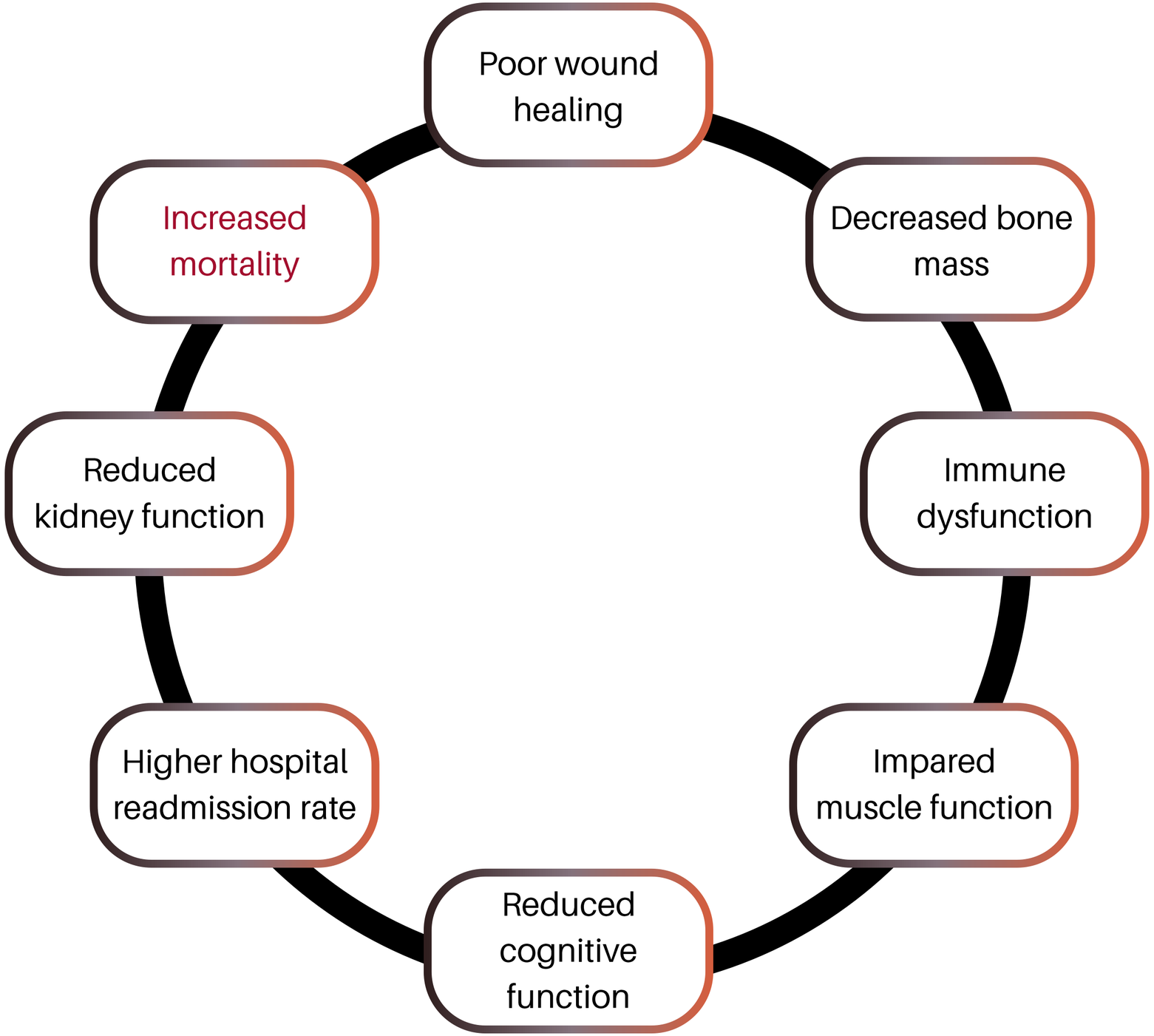
protein/energy intake

protein/energy consumption



CONSEQUENCES OF MALNUTRITION

- Malnutrition risk
- Loss weight
- Loss appetite
- Dysphagia
- Deficiency of vitamin D
- Deficiency of vitamin B12
- Folic acid deficiency



AIM OF THE STUDY

The study aimed to evaluate the effect of different indicators of nutritional status including undernutrition, the risk of malnutrition, malnutrition, weight loss or loss of appetite, dysphagia, and deficiencies of vitamin B12, folate, vitamin D on mortality in older patients.

ETHICAL APPROVAL AND STATISTICAL POWER ANALYSIS

- Bezmialem Vakıf University Ethics Committee (February, 2023)
- Bezmialem Vakıf University Academic Board (December, 2022)
- TÜBİTAK (The Scientific and Technological Research Council of Türkiye, A 2209)
- Sample size and power calculation determined that sufficient statistical power required 264 elderly patients

BEZMIALEM VAKIF UNIVERSITY 1845

TÜBİTAK 2209-A Üniversite Öğrencileri Araştırma Projeleri Destekleme Programı

MATERIAL & METHOD

Inclusion criterion

- November 2018 and June 2023 were examined
- Recorded document has no missing part
- Underwent Comprehensive geriatric assessment

Exclusion criterion

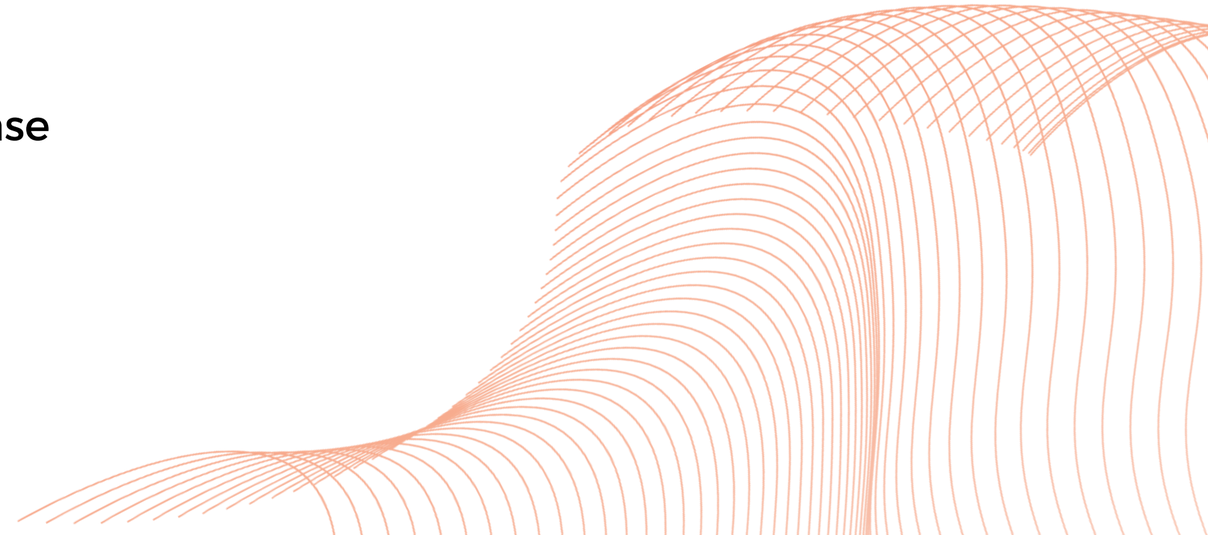
- Severe illnesses
- Severe dementia and delirium
- Vision or hearing impairment hindering communication

Comprehensive geriatric assessment;

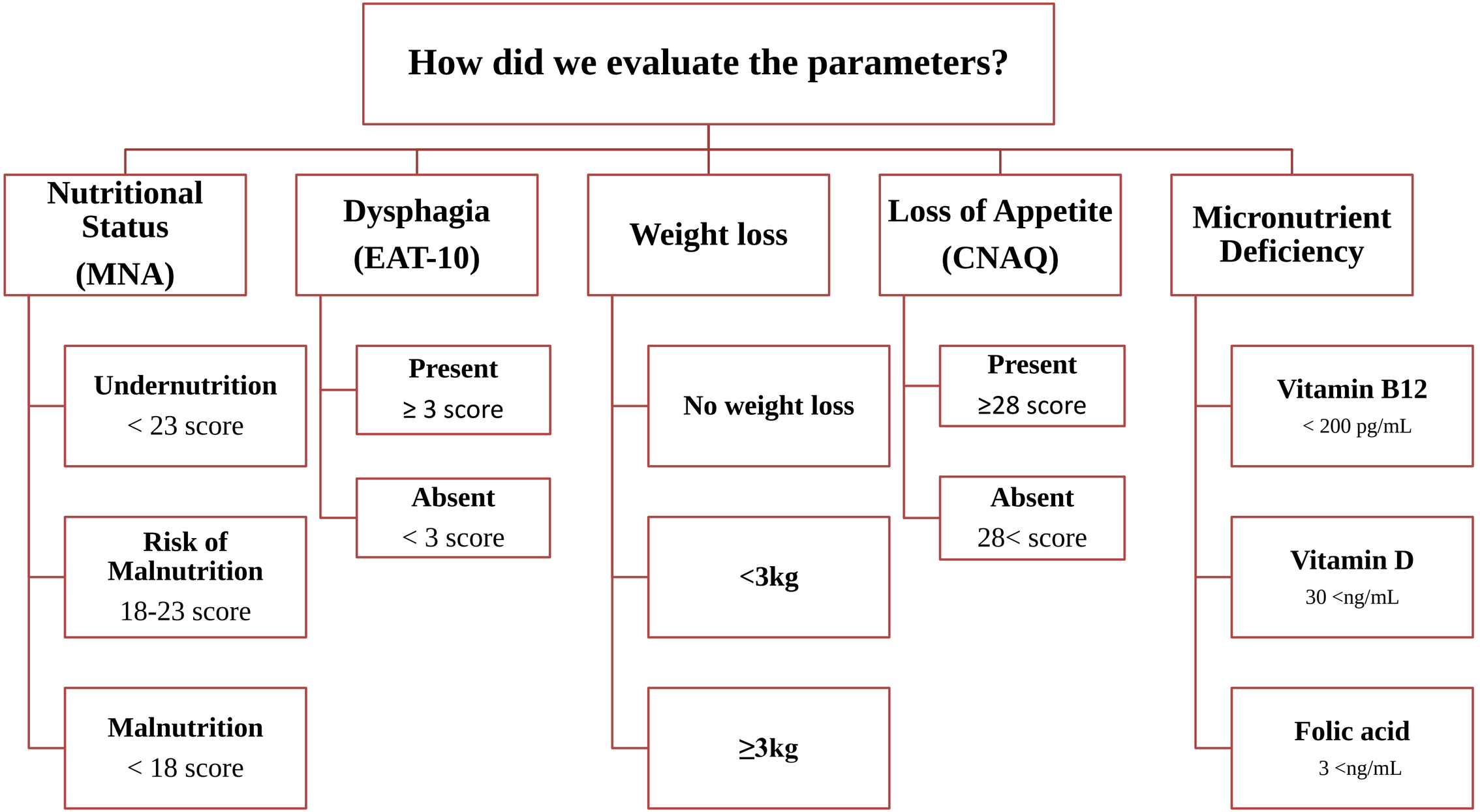
- Age, years, sex
- Educational Level
- Body weight, BMI
- Comorbidities

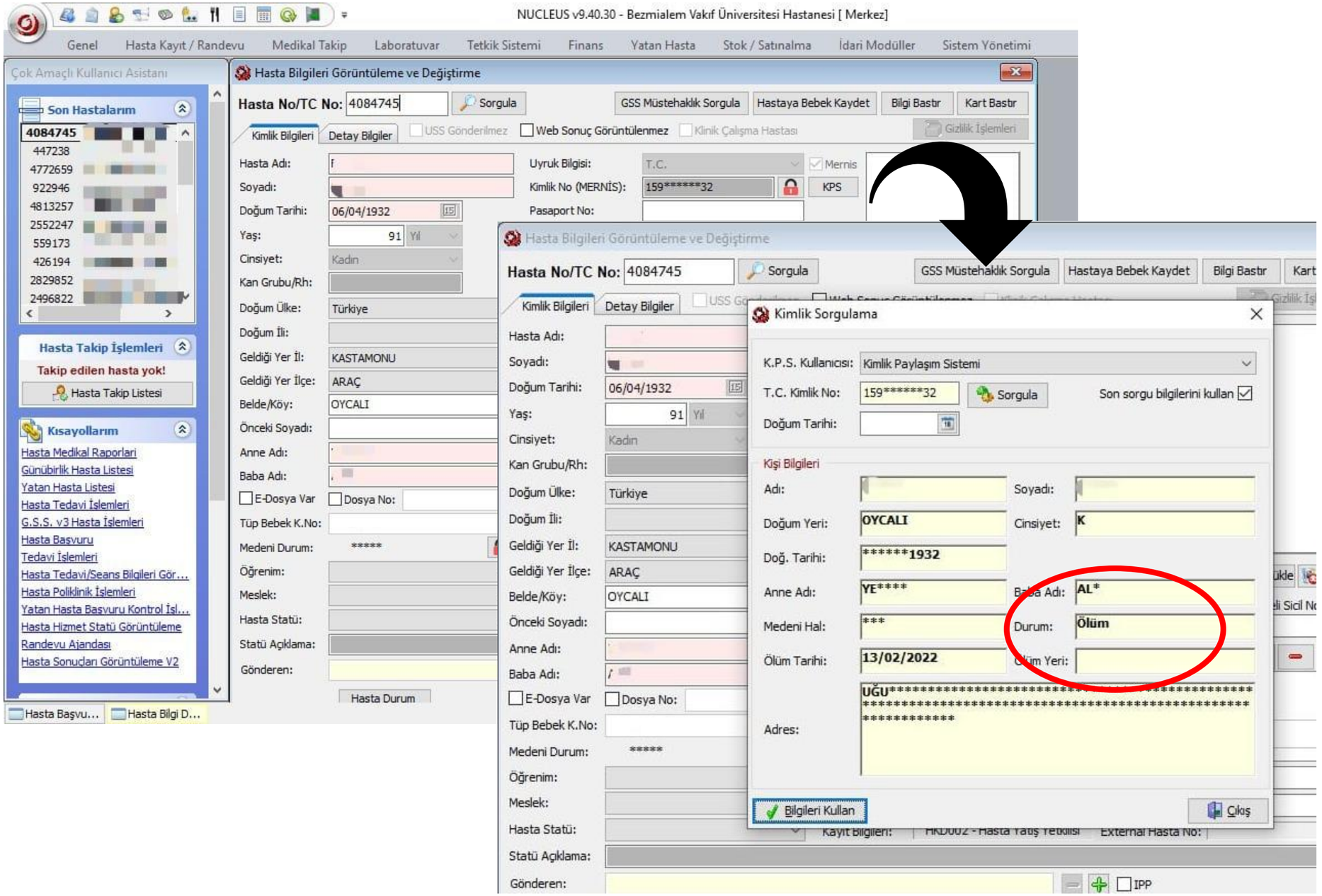
2 and more comorbid diseases → **Multimorbidite**

  - Diabetes Mellitus
  - Dementia
  - Hypertension
  - Coronary Artery Disease
  - Chronic Obstructive Pulmonary Disease
  - Cerebrovascular Disease
  - Chronic Kidney Disease
  - Congestive Heart Failure
  - Parkinson Disease



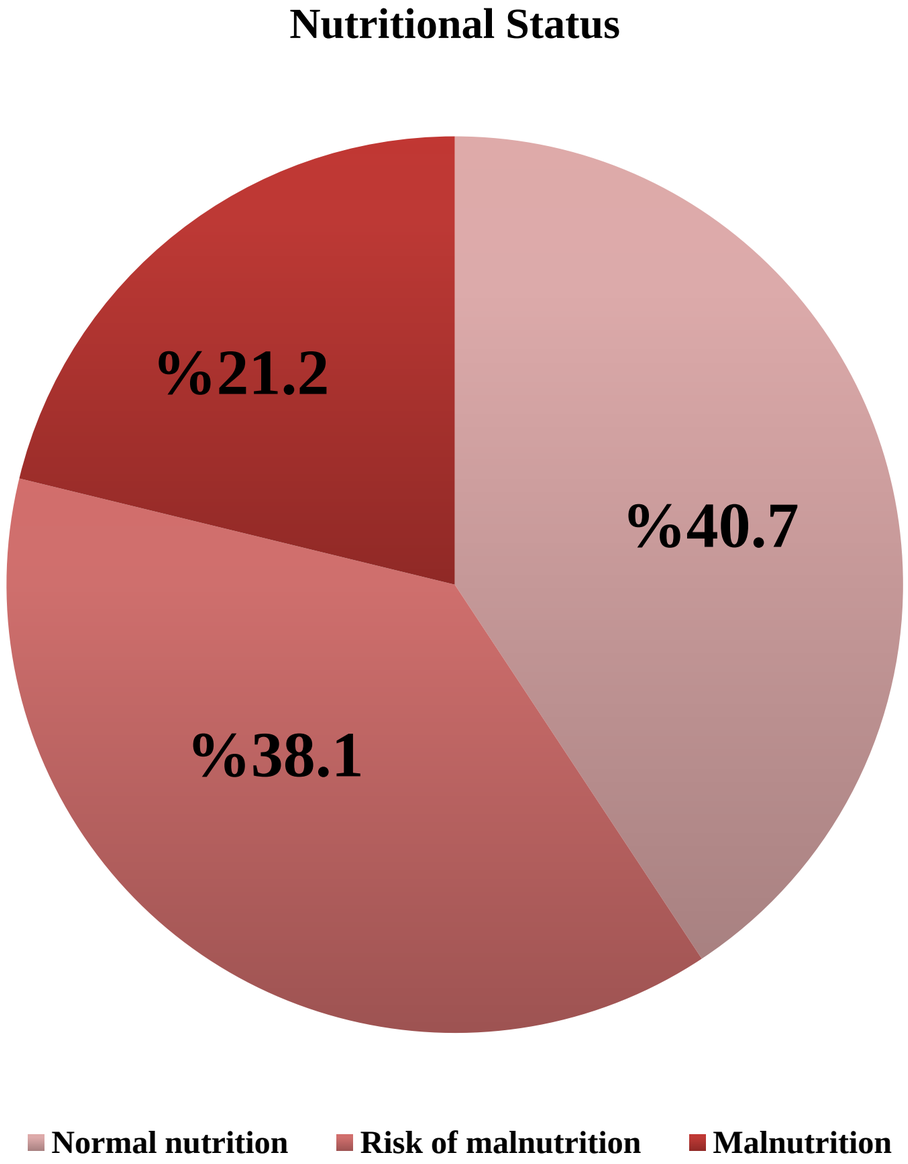
How did we evaluate the parameters?




NUCLEUS v9.40.30 - Bezmialem Vakıf Üniversitesi Hastanesi [Merkez]
Genel
Hasta Kayıt / Randevu
Medikal Takip
Laboratuvar
Tetkik Sistemi
Finans
Yatan Hasta
Stok / Satınalma
İdari Modüller
Sistem Yönetimi
Çok Amaçlı Kullanıcı Asistanı
Son Hastalarım
4084745
447238
4772659
922946
4813257
2552247
559173
426194
2829852
2496822
Hasta Takip İşlemleri
Takip edilen hasta yok!
Hasta Takip Listesi
Kısayollarım
Hasta Medikal Raporları
Günübirlik Hasta Listesi
Yatan Hasta Listesi
Hasta Tedavi İşlemleri
G.S.S. v3 Hasta İşlemleri
Hasta Başvuru
Tedavi İşlemleri
Hasta Tedavi/Seans Bilgileri Gör...
Hasta Poliklinik İşlemleri
Yatan Hasta Başvuru Kontrol İşl...
Hasta Hizmet Statü Görüntüleme
Randevu Ajandası
Hasta Sonuçları Görüntüleme V2
Hasta Başvu...
Hasta Bilgi D...
Hasta Bilgileri Görüntüleme ve Değiştirme
Hasta No/TC No: 4084745
Sorgula
GSS Müstehaklık Sorgula
Hastaya Bebek Kaydet
Bilgi Bastır
Kart Bastır
Kimlik Bilgileri
Detay Bilgiler
USS Gönderilmez
Web Sonuç Görüntülenmez
Klinik Çalışma Hastası
Gizlilik İşlemleri
Hasta Adı:
Soyadı:
Doğum Tarihi: 06/04/1932
Yaş: 91 Yıl
Cinsiyet: Kadın
Kan Grubu/Rh:
Doğum Ülke: Türkiye
Doğum İli:
Geldiği Yer İl: KASTAMONU
Geldiği Yer İlçe: ARAÇ
Belde/Köy: OYCALI
Önceki Soyadı:
Anne Adı:
Baba Adı:
E-Dosya Var
Dosya No:
Tüp Bebek K.No:
Medeni Durum: *****
Öğrenim:
Meslek:
Hasta Statü:
Statü Açıklama:
Gönderen:
Hasta Durum
Uyruk Bilgisi: T.C.
Mernis
Kimlik No (MERNİS): 159******32
KPS
Pasaport No:
Kimlik Sorgulama
K.P.S. Kullanıcısı: Kimlik Paylaşım Sistemi
T.C. Kimlik No: 159******32
Sorgula
Son sorgu bilgilerini kullan
Doğum Tarihi:
Kişi Bilgileri
Adı:
Soyadı:
Doğum Yeri: OYCALI
Cinsiyet: K
Doğ. Tarihi: ******1932
Anne Adı: YE****
Baba Adı: AL*
Medeni Hal: ***
Durum: Ölüm
Ölüm Tarihi: 13/02/2022
Ölüm Yeri:
Adres: UĞU**********
Bilgileri Kulları
Çıkış
IPP

RESULTS

- 1911 older patients
- Average age of 81.0±13.0
- Female ratio is 70.8%
- On average followed 71.61 months (6 years)

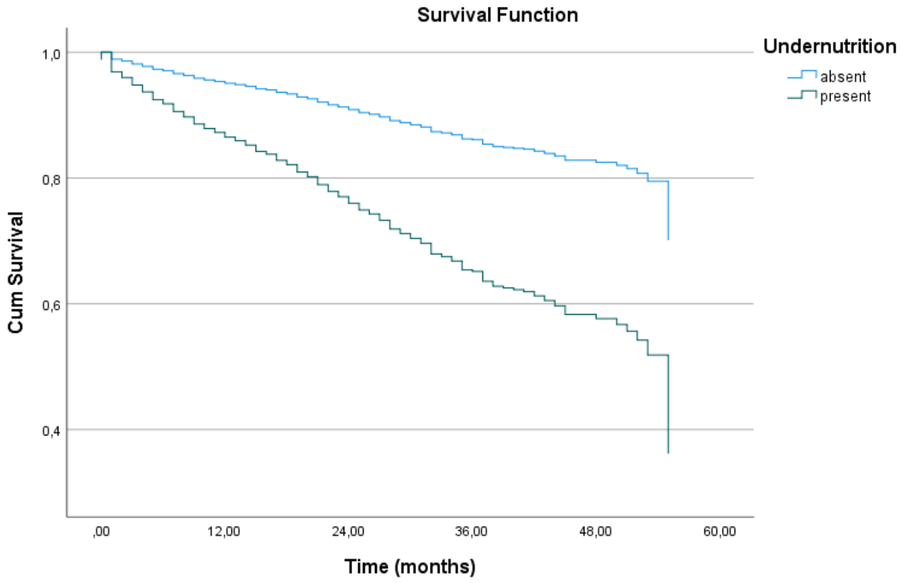


Parameters	Normal nutrition (n=778)	Risk of malnutrition (n=728)	Malnutrition (n=405)	P value
Age, years	79.14 ± 7.79	81.74 ± 7.57	83.66 ± 7.42	0.267
Female, %	65.8	75.1	72.8	<0.001
Educational Level, years	5.0 (0-28.0)	5.0 (0-18.0)	4.0 (0-16.0)	<0.001
Body weight, kg	76.01 ± 13.27	69.97 ± 13.51	62.36 ± 15.58	<0.001
Body Mass Index, kg/m^2	30.27 ± 5.22	28.95 ± 5.59	26.23 ± 6.28	<0.001
Falls, %	35.5	49.2	51.3	<0.001
Decreased Calf Circumference, %	3.0	10.0	35.1	<0.001
BADL	95.0 (0-100.0)	81.0 (0-100.0)	55.0 (0-100.0)	<0.001
IADL	19.0 (0-23.0)	10.0 (0-23.0)	3.0 (0-23.0)	<0.001
Comorbidities, %				
Diabetes Mellitus	34.7	%38.8	34.5	0.178
Dementia	19.2	40.0	46.2	<0.001
Hypertension	70.8	70.4	66.3	0.232
Coronary Artery Disease	18.4	21.0	20.3	0.444
Chronic Obstructive Pulmonary Disease	7.1	5.9	8.2	0.335
Cerebrovascular Disease	8.7	12.9	15.1	<0.001
Chronic Kidney Disease	38.4	52.2	54.8	<0.001
Congestive Heart Failure	8.2	12.1	16.4	<0.001
Parkinson Disease	4.5	12.2	3.4	<0.001
Nutritional Parameters				
MNA Skor	25.5 (23.3-30.0)	21.0 (17.5-23.0)	13.5 (0-17.0)	<0.001
Dysphagia, %	16.3	26.0	47.7	<0.001
Loss of appetite, %	27.7)	63.7	92.0	<0.001
Weight loss, %	10.3	40.6	82.2	<0.001
Vitamin D deficiency, %	41.4	43.8)	44.5	0.637
Folate Deficiency, (<3 ng/ml),%	3.3	5.3	9.6	<0.001
Vitamin B12 deficiency, (<200 ng/ml),%	11.7	8.0	10.5	0.111

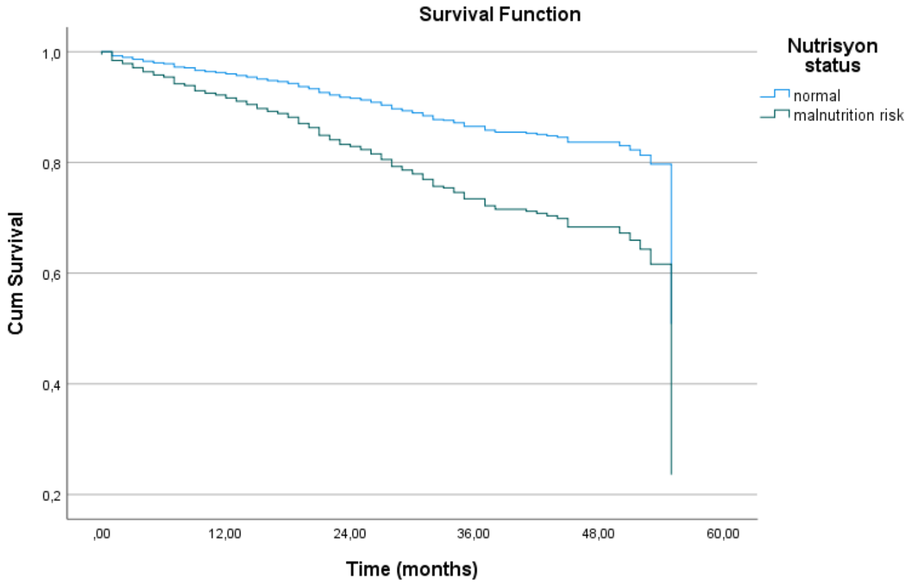
Table 1 showed that characteristics of the patients according to the nutritional status

	Univariate			Multivariate[a]			Multivariate[b]		
	HR	**95% CI**	**p**	**HR**	**95% CI**	**P**	**HR**	**95% CI**	**P**
Undernutrition	3.32	2.56-4.30	<0.001	2.96	2.25-3.89	<0.001	2.86	2.19-3.73	<0.001
Malnutrition risk	2.29	1.72-3.05	<0.001	2.11	1.56-2.85	<0.001	2.13	1.59-2.85	<0.001
Malnutrition	2.40	2.07-2.79	<0.001	4.81	3.50-6.62	<0.001	4.40	3.26-5.95	<0.001
Weight loss (≥3 kg)	2.62	2.12-3.24	<0.001	2.41	1.94-2.98	<0.001	2.45	1.95-3.09	<0.001
Weight loss (<3 kg)	2.39	0.87-1.75	<0.001	1.04	0.73-1.49	<0.001	0.97	0.65-1.45	0.89
Dysphagia	1.24	1.85-2.98	<0.001	2.15	1.67-2.76	<0.001	1.71	1.37-2.14	<0.001
Loss of Appetite	1.67	1.32-2.13	<0.001	1.62	1.25-2.09	<0.001	1.62	1.26-2.06	<0.001
Vitamin D deficiency	1.55	1.17-2.05	0.002	1.66	1.23-2.23	<0.001	1.62	1.24-2.11	<0.001
Folic acid Deficiency	1.98	1.17-3.35	0.010	1.55	0.88-2.73	0.123	1.20	0.77-1.88	0.404
Vitamin B12 deficiency	0.95	0.61-1.48	0.848	1.16	0.72-1.84	0.531	0.71	0.46-1.09	0.122

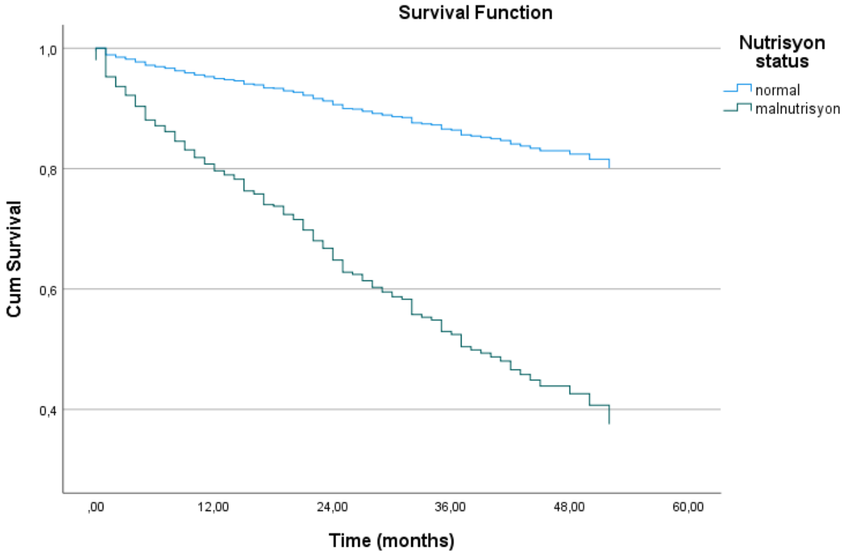
[a]Multivariate regression model included age and sex. [b]Multivariate hazard ratio after adjusted for age, sex and multimorbidity



1a

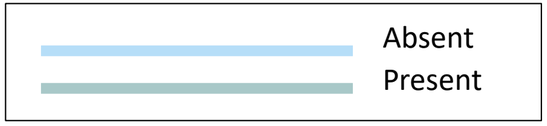


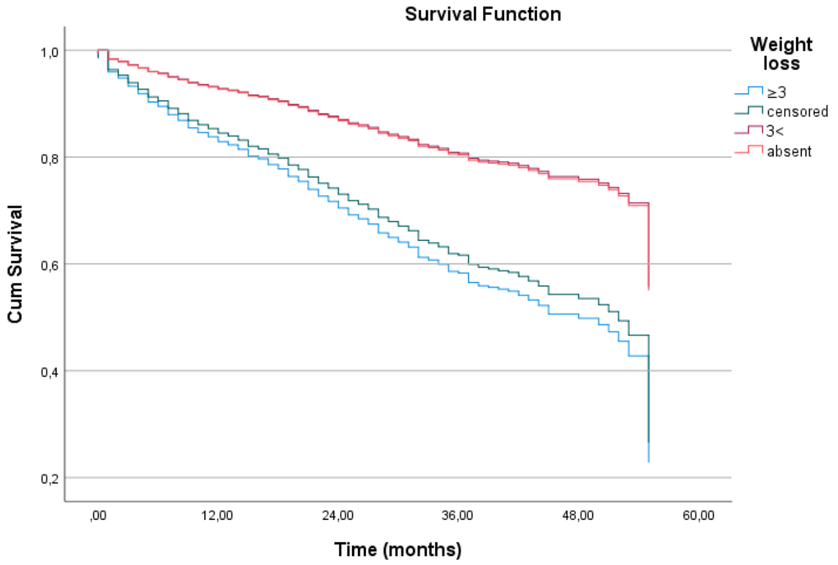
1b



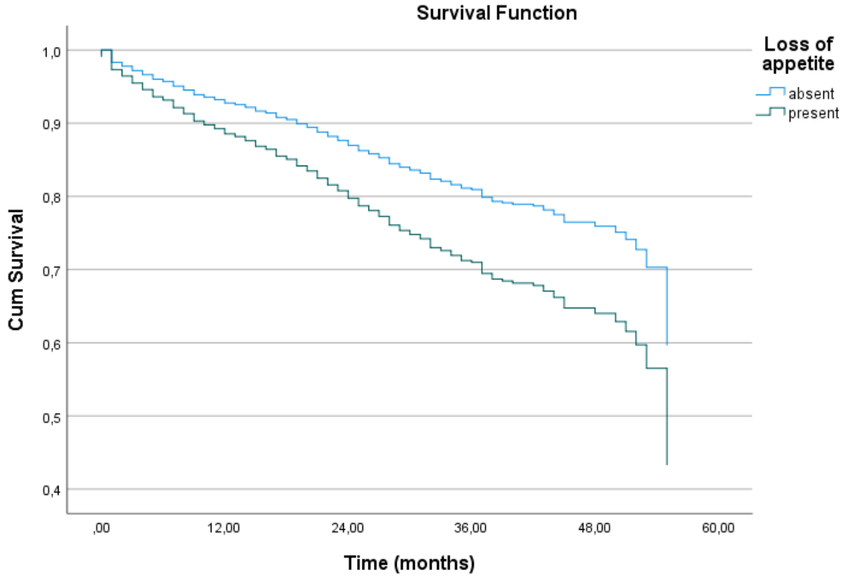
1c

Figures 1a, b, and c, show **Kaplan-Meier** curves of different nutritional parameters including; **undernutrition, risk of malnutrition, and malnutrition**.

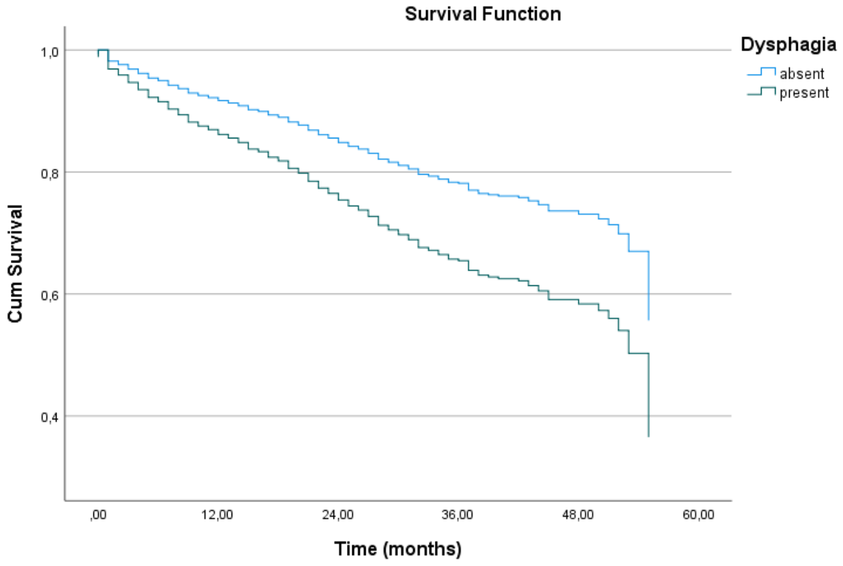




2a

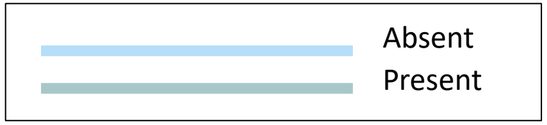


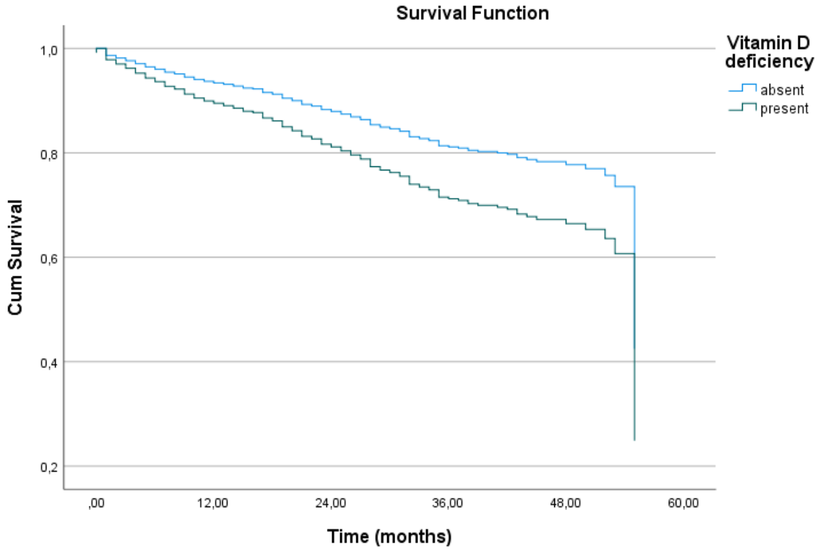
2b



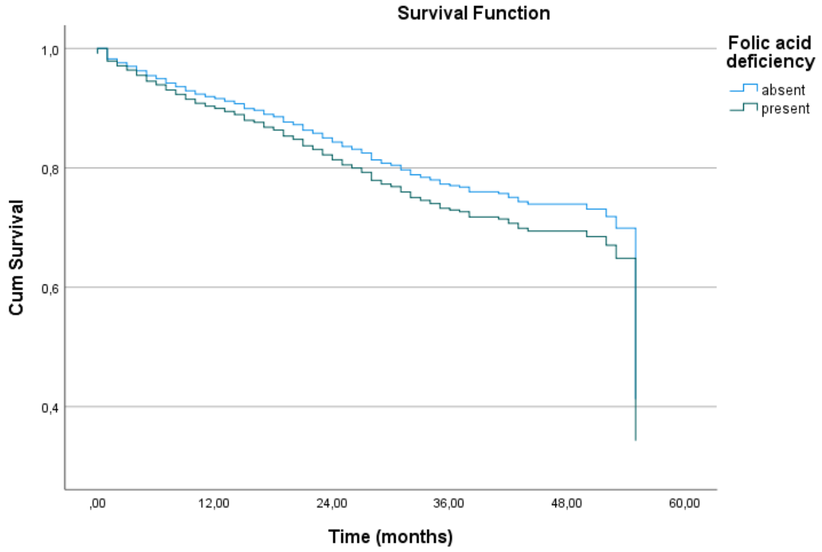
2c

Figure 2a, b and c, show **Kaplan-Meier** curves of different nutritional parameters including; **weight loss, loss of appetite, and dysphagia**

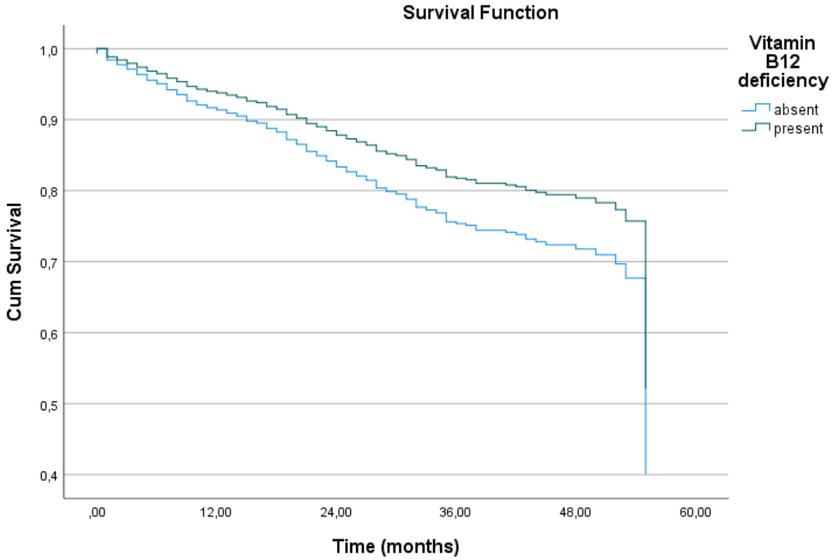




3a



3b



3c

Figure 3a, b and c, show **Kaplan-Meier** curves of different nutritional parameters including; **vitamin D deficiency, folate deficiency, and vitamin B12 deficiency**

Absent
Present

Powerful sides

- High sample size
- Evaluation with multiple parameters
- Comprehensive geriatric assessment

Limitations

- Retrospective study
- Evaluation of drugs one by one
- Intermittent patients could not be examined
- Used MNA's weight criterion when evaluating weight loss

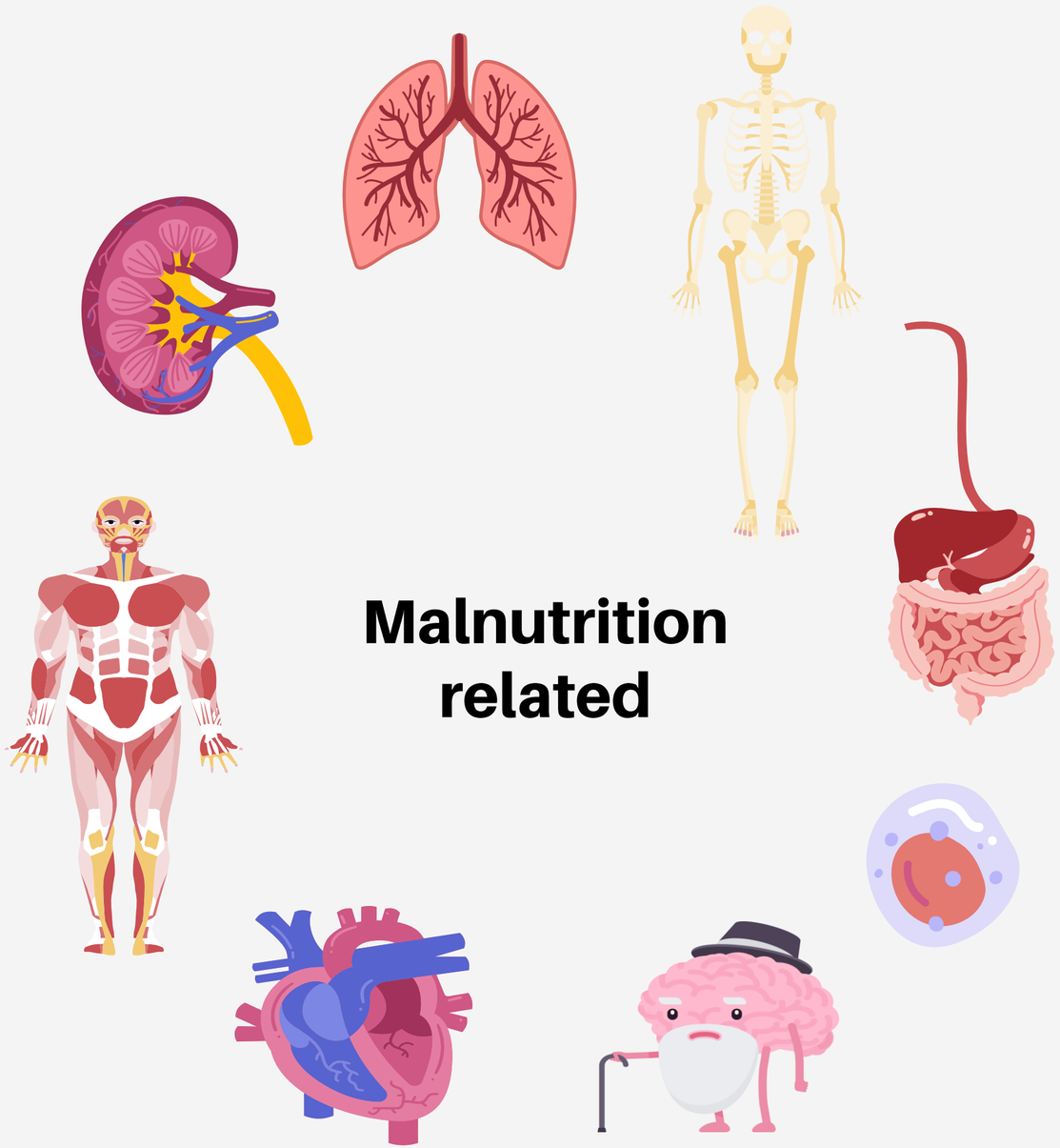
CONCLUSION & DISCUSS

Associated with mortality;

- Malnutrition (HR: 4.40)
- Undernutrition (HR: 2.86)
- Risk of malnutrition (HR: 2.13)
- Weight loss ,≥3kg (HR: 2.45)
- Dysphagia (HR: 1.71)
- Loss of appetite (HR: 1.62)
- Vitamin D deficiency (HR: 1.62)

Not-associated with mortality;

- Weight loss, 3kg >
- Vitamin B12 deficiency
- Folic acid deficiency



Vitamin D deficiency associated with mortality;

Review > Am J Geriatr Pharmacother. 2010 Feb;8(1):4-33. doi: 10.1016/j.amjopharm.2010.02.004.

Extraskeletal effects of vitamin D in older adults: cardiovascular disease, mortality, mood, and cognition

Karen Barnard [1], Cathleen Colón-Emeric

Affiliations + expand

Low Vitamin D Levels and Frailty Status in Older Adults: A Systematic Review and Meta-Analysis

Diego Marcos-Pérez [1 2], María Sánchez-Flores [1 3 4], Stefania Proietti [5], Stefano Bonassi [6 7], Solange Costa [3 4], Joao Paulo Teixeira [3 4], Juan Fernández-Tajes [8 9], Eduardo Pásaro [1 2], Vanessa Valdiglesias [2 4 10], Blanca Laffon [1 2]

Affiliations + expand

PMID: 32751730 PMCID: PMC7469050 DOI: 10.3390/nu12082286

> Nutr Res. 2009 Aug;29(8):525-30. doi: 10.1016/j.nutres.2009.07.007.

Low serum 25-hydroxyvitamin D concentrations are associated with greater all-cause mortality in older community-dwelling women

Richard D Semba [1], Denise K Houston, Luigi Ferrucci, Anne R Cappola, Kai Sun, Jack M Guralnik, Linda P Fried

Many Thanks to,

- Prof. Dr. Pınar Soysal
- Associate Prof. Dr. Özge Pasin
- Rabia Koç

&

- organizing committee

Thank you for listening

Do you have any questions/contributions ?

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18- 24 March

Respect for the Elderly Week