Çocuk Beslenmesindeki Yanlışların Erişkin Sağlığına Etkileri

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12-15 MAYIS 2022
LİMAK CYPRUS DELUXE HOTEL K.K.T.C

ÖNCELİKLER DEĞİŞTİ

Symposium: The Effects of Childhood Diet on Adult Health and Disease

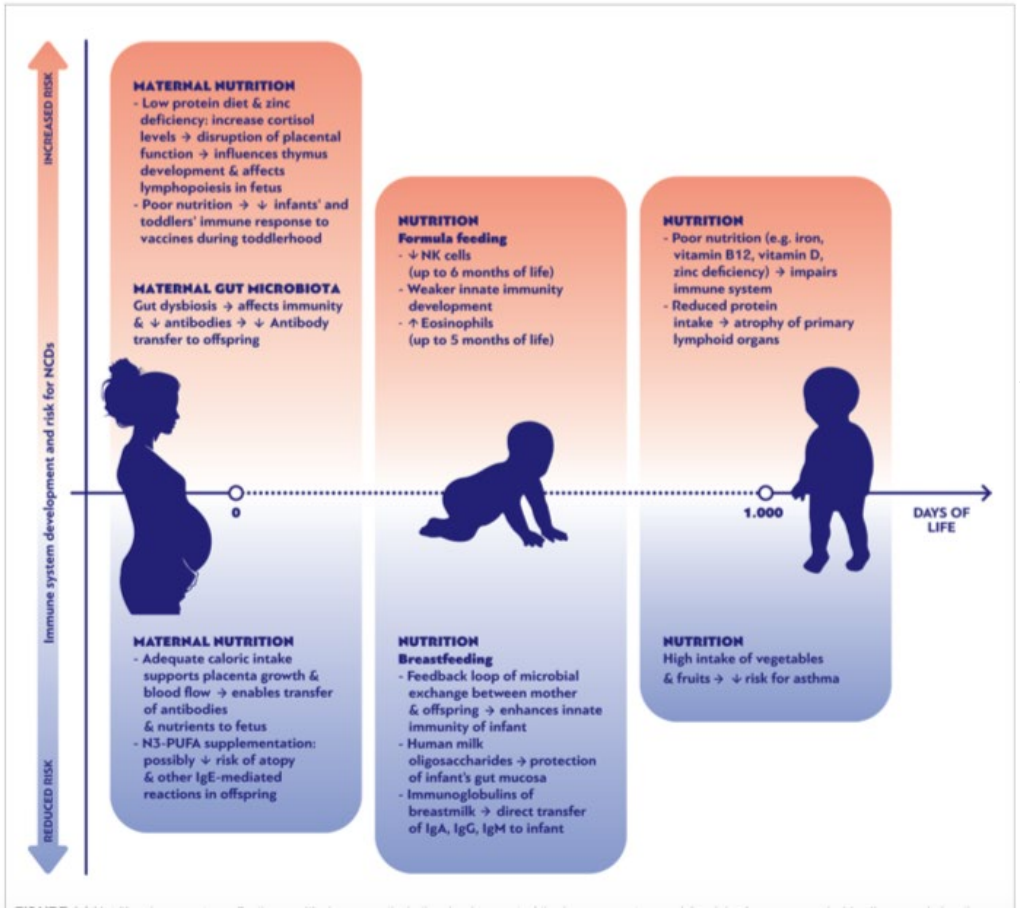
Erişkin hastalık etiyolojisini anlamada yaşam boyu yaklaşım modelleri

Bebek& çocuk beslenmesinin kısa ve uzun vadeli sağlığa etkileri

Son yıllarda, beslenme araştırmalarının odak noktası,

beslenme ihtiyaçlarının karşılanması ve eksikliklerin önlenmesinden,
beslenmenin uzun vadeli sağlık üzerindeki etkilerini anlamaya yöneldi

Beslenme



İlk 1000 Gün

Bağırsak mikrobiyota bileşimini etkileyerek çocuğun gelişiminde kilit

ERİŞKİN DÖNEM

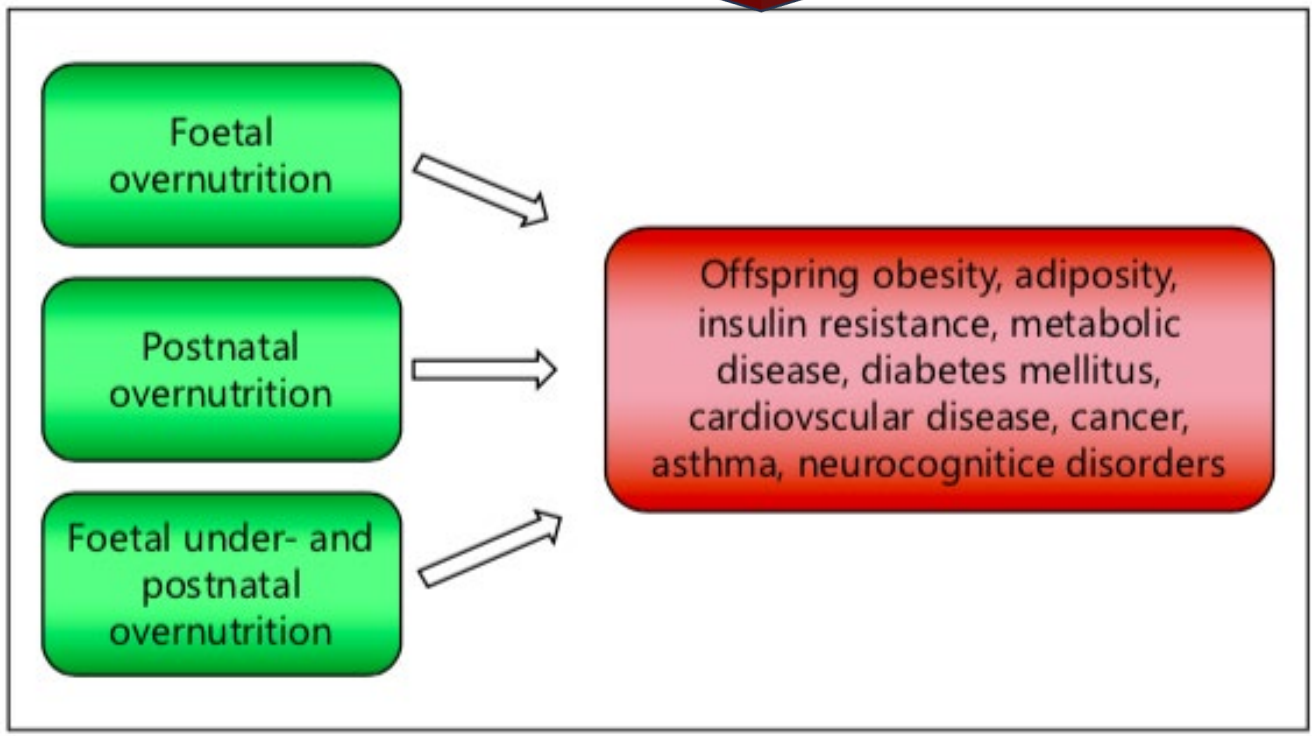
Front Immunol. 2021; 18;12:644269

Doğum öncesi & sonrası beslenme Plastisite üzerine etkisi

Beslenme ve metabolik faktörler

- Sitogenez
- Organogenez
- Metabolik ve endokrin yanıt
- Gen ekspresyonunun epigenetik modülasyonu

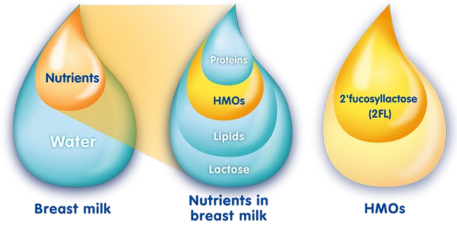
Epidemiyologlar yetersiz beslenmeden aşırı beslenmeye doğru "beslenme geçişi"

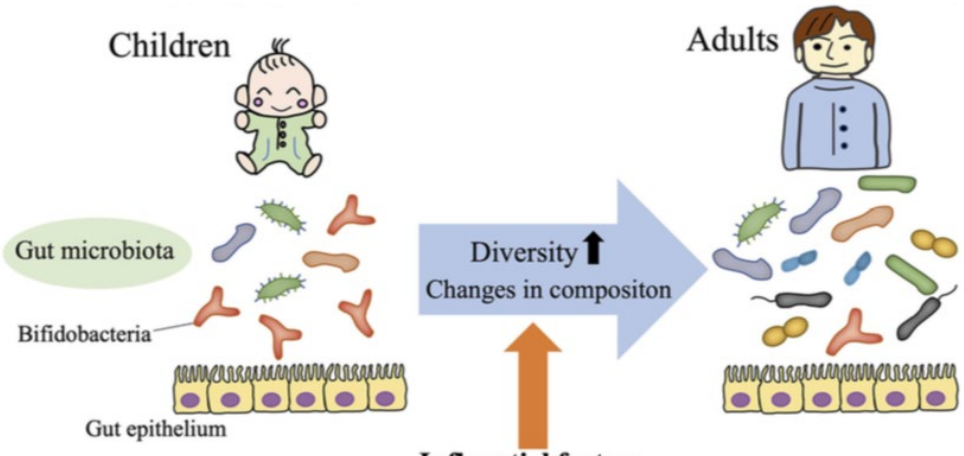


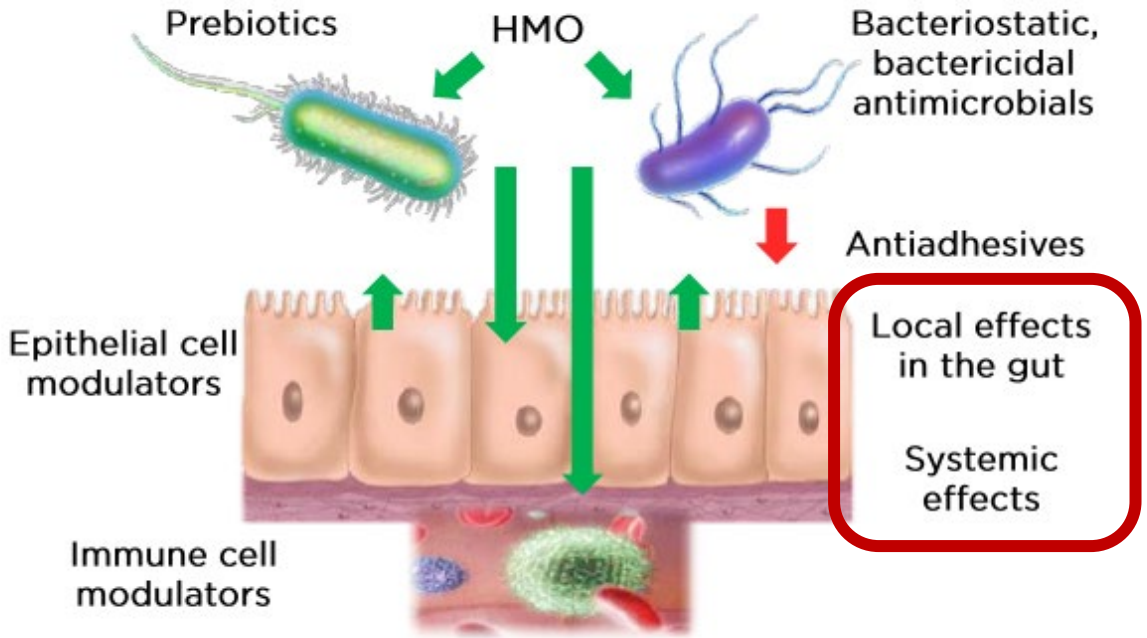
Yaşam boyu sağlık ve hastalık riskinin metabolik programlanması indüklenir

Ann Nutr Metab 2017;70:161–169

Çocukluk → Erişkin dönem



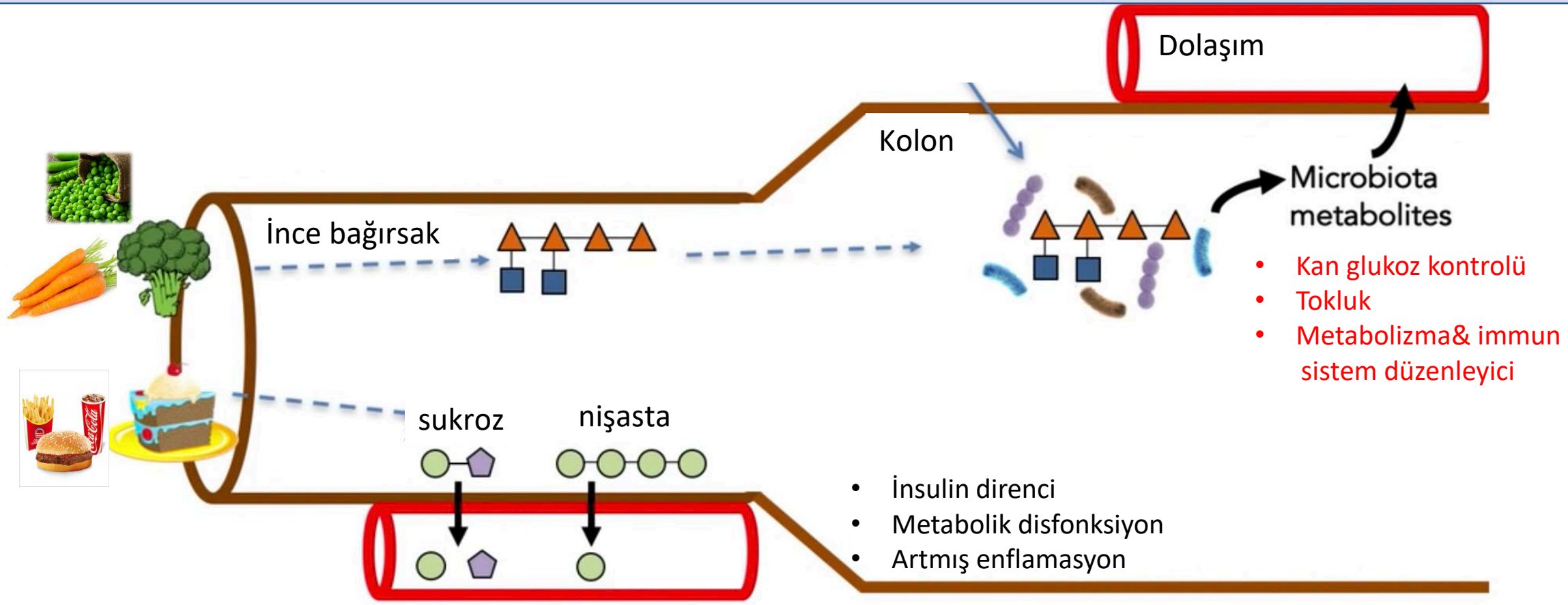




Cell Metab. 2014; 20(5): 779–786.
Front Nutr. 2021; 25;8:700058

Geleneksel beslenme

↑ Mikrobiyotaya ulaşabilen karbonhidrat → Mikrobiota çeşitlilik, Metabolik kapasite ↑ → KORUNMA



- Kan glukoz kontrolü
- Tokluk
- Metabolizma& immun sistem düzenleyici

- İnsulin direnci
- Metabolik disfonksiyon
- Artmış enflamasyon

(Sonnenburg ED, et al. Cell Metab. 2014)

Endüstriyel beslenme

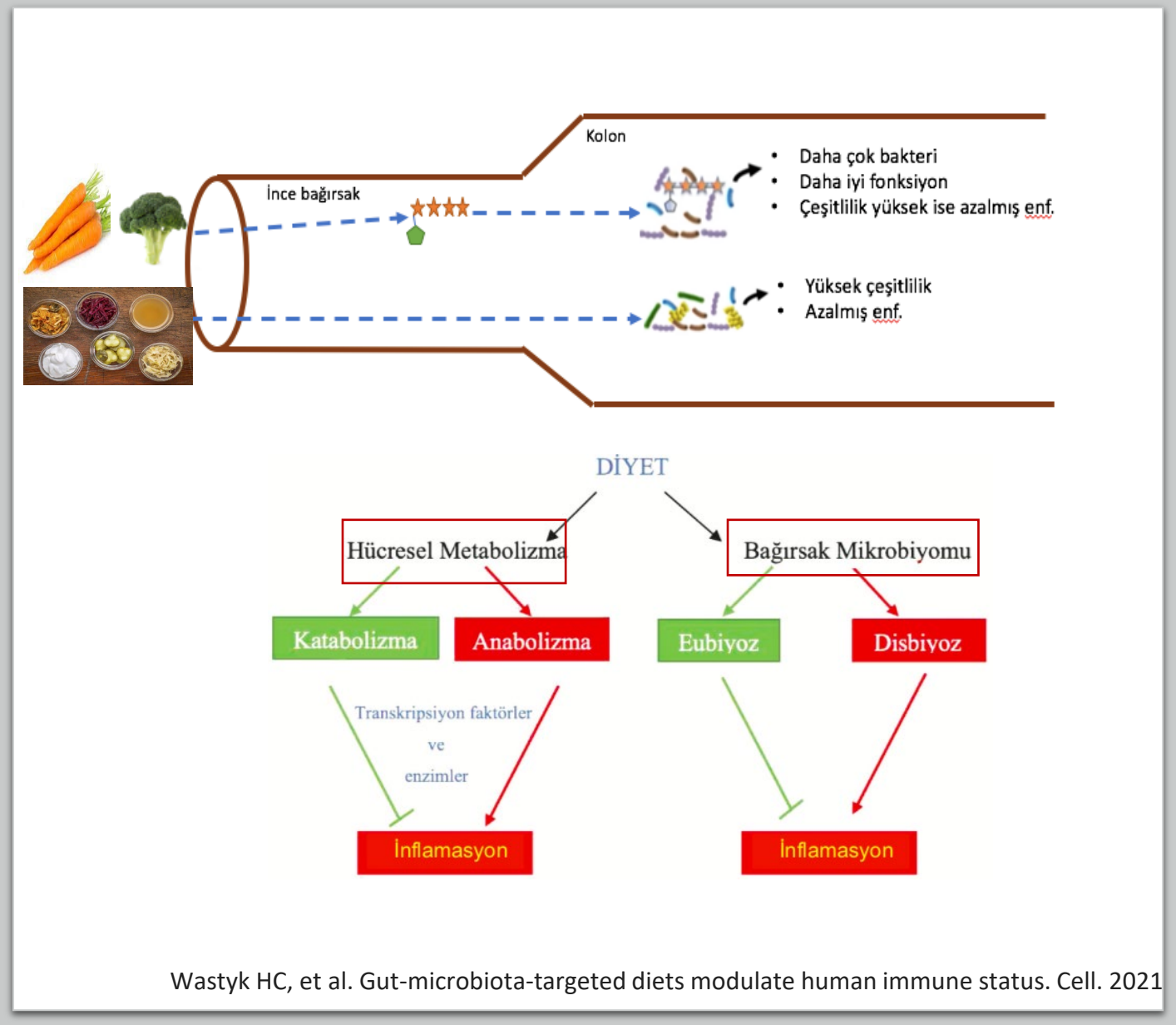
↓ Mikrobiyotaya ulaşabilen karbonhidrat → Mikrobiota çeşitlilik, Metabolik kapasite ↓ → KRONİK HASTALIKLAR

Cell Metab. 2014; 20(5): 779–786.
Front Nutr. 2021; 25;8:700058

Endüstriyel tip beslenme

- Aşırı işlenmiş besin ve fazla fruktoz
- Fermente ve lifli besin az

- Bağırsak florası bozulur
- Mikrobiyom çeşitililiğini azalır, kompozisyonu değişir
- Barsak musin tabakası incelir
- Dolaşımda patolojik mikrobiyal ve yan ürünler artar
- Tokluk merkezi sinyallerini bozulur, sürekli açlık hali
- İnflamasyonu artışı
- Hepatosteatoz ve bağırsak geçirgenliğinde artış

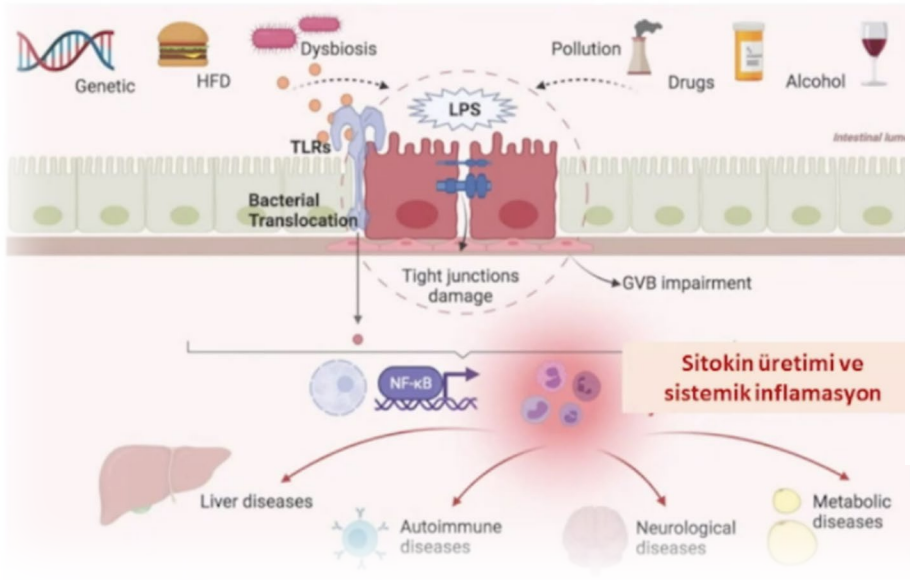


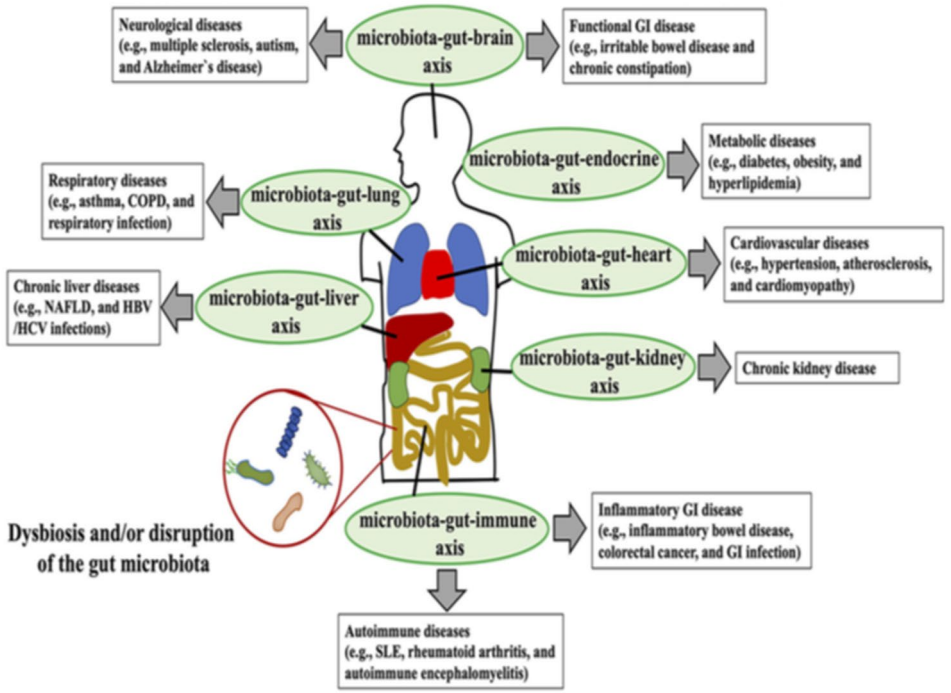
Wastyk HC, et al. Gut-microbiota-targeted diets modulate human immune status. Cell. 2021

Microbiol Spectr. 2015:3(3).

Int J Ffood Sci Tech- nol. 2016;51(9):1937-46

DİSBİYOZİS &KRONİK DÜŞÜK DERECELİ İNFLAMASYON





Bacteroides, proteobacteria (E.Coli,Klebsiella,Enterobacter,Acinetobacter) ⇧

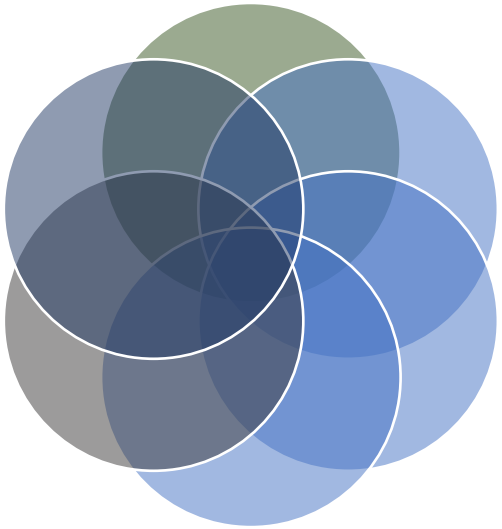
Bifidobacter, Lactobasillus, Enterococ,Akkermensia, Firmicutes ⇩

Erişkin dönem &kronik hastalıklar

Infant Nutrition and Later Health: A Review of Current Evidence

AS &yetişkinlikte “daha sağlıklı” beslenme düzenine sahip

yetişkin sağlığı etkiler



Emzirme, anne diyetinden gelen uçucu tat bileşiklerine maruz bırakır

Tat tercihi ve gıda reddi yaşam boyu beslenme alışkanlıkları için önemli

Emzirme bebeklik döneminde tat tercihi edinimini etkiler

Erken diyet maruziyetleri tat tercihini etkilemekte

Nutrients 2012, *4*, 859-874

Pediatrics. 2018 ;141(2):e20173716.

AS erken kesilmesi

- Emzirme, obezite, kan basıncı,dislipdemi ve diyabet riskine etkileri
- Emzirmeyi 6 aydan önce durdurmak, yaşamın ilerleyen dönemlerinde aşırı kilo ve obezite riskinde artış
- 6 aydan önce AS dışında bir süt verilmesi 20 yıl sonra obezite riskinde artış

Annals of Nutrition & Metabolism

Ann Nutr Metab 2014;64:262–270
DOI: 10.1159/000365031

Published online: October 2, 2014

Early Infant Feeding and Adiposity Risk: From Infancy to Adulthood

Wendy H. Oddy[a] Trevor A. Mori[b] Rae-Chi Huang[a] Julie A. Marsh[a]
Craig E. Pennell[c] Paola T. Chivers[d] Beth P. Hands[d] Peter Jacoby[a]
Peter Rzehak[e] Berthold V. Koletzko[e] Lawrence J. Beilin[b]

BMJ. 1992 Mar 28;304(6830):801-5. doi: 10.1136/bmj.304.6830.801.

Relation of infant feeding to adult serum cholesterol concentration and death from ischaemic heart disease

- ✓ 1911-1930 /İngiltere
- ✓ 5718 E / 474 İskemik kalp hast ex
- ✓ 1381 AS+Formula
- ✓ 3733 sadece AS
- ✓ 357 sadece formula

- ✓ Sütten kesme yaşı
- ✓ Bebek besleme yöntemi,
- ✓ Yetişkin LDL kolesterol düzeyi ve iskemik kalp hastalığı ölüm oranına etkili

TABLE I—*Standardised mortality ratios for ischaemic heart disease in 5471 men born in east Hertfordshire, 1911-30, according to method of feeding as infants. (Numbers of deaths are in parentheses)*

Weight at 1 year (lb)	Breast fed: Breast and bottle fed	Breast fed: Weaned at 1 year	Breast fed: Not weaned at 1 year	Bottle fed	All
≤18	87 (8)	93 (14)	140 (10)	126 (4)	104 (36)
−20	88 (21)	93 (39)	95 (26)	97 (6)	93 (92)
−22	90 (37)	92 (77)	121 (55)	75 (9)	97 (178)
−24	66 (22)	69 (51)	65 (21)	109 (13)	71 (107)
−26	42 (8)	67 (24)	87 (13)	104 (6)	68 (51)
>26	26 (2)	23 (3)	73 (4)	50 (1)	36 (10)
All weights	73 (98)	79 (208)	97 (129)	95 (39)	83 (474)
95% Confidence interval	59 to 89	69 to 90	81 to 115	68 to 130	75 to 90
Ratio for non-circulatory disease	74 (147)	84 (329)	85 (166)	69 (42)	81 (684)
95% Confidence interval	62 to 87	75 to 94	73 to 99	50 to 94	75 to 87

	Breast fed: Breast and bottle fed (n=116)	Breast fed: Weaned at 1 year (n=253)	Breast fed: Not weaned at 1 year (n=91)	Bottle fed (n=25)	All groups (No of men) (n=485)	Standard deviation
Cholesterol (mmol/l)	6·6	6·6	6·9*	7·0*	6·7 (485)	1·2
Non-fasting cholesterol (mmol/l)	6·4	6·4	6·9**	7·1**	6·5 (431)	1·2
Low density lipoprotein cholesterol (mmol/l)	4·6	4·6	5·0**	5·1*	4·7 (470)	1·1
High density lipoprotein cholesterol (mmol/l)	1·2	1·2	1·2	1·2	1·2 (470)	0·3
Low density lipoprotein:high density lipoprotein	3·8	3·8	4·2**	4·2	3·9 (470)	1·5
Triglyceride (mmol/l)†	1·4	1·4	1·5	1·4	1·4 (485)	1·6
Apolipoprotein A1 (g/l)†	1·31	1·30	1·29	1·35	1·30 (466)	1·2
Apolipoprotein B (g/l)†	1·08	1·08	1·14	1·14	1·09 (464)	1·3
Lp(a) lipoprotein (mg/l)†	92	100	96	83	97 (469)	3·6
Height (m)	1·71	1·72	1·72	1·72	1·72 (485)	0·07
Body mass index (kg/m²)	26·5	27·0	27·1	27·1	26·9 (485)	3·5
% Current smokers	23	28	27	28	27 (482)	44
% Current social class IV or V	25	24	29	24	25 (480)	43
% Social class IV or V at birth	46	48	64**	50	51 (458)	50

BMJ. 1992;304:801–805

AS SÜRESİ / AŞIRI KİLOLU&OBEZİTE

- 17 Çalışmanın değerlendirildiği meta analiz
- Uzun bir emzirme süresi yetişkinlikte aşırı kilo riskinde azalma ile doğrusal ilişkili
- Erişkinlikte aşırı kilolu olma riski, emzirmenin her ek ayı için %4 oranında azalmakta

TABLE 3. Duration of breastfeeding and risk of overweight: categorial analysis (random-effects model)

	Duration of breastfeeding				
	<1 month	1–3 months	4–6 months	7–9 months	>9 months
No. of duration-specific study estimates	5	14	15	11	7
Odds ratio for overweight	1.0	0.81	0.76	0.67	0.68
95% confidence interval	0.65, 1.55	0.74, 0.88	0.67, 0.86	0.55, 0.82	0.50, 0.91

Am J Epidemiol 2005;162:397–403

- AS &endojen kolesterol sentezi üzerine etkisi yaşamın ilerleyen dönemlerinde belirginleşen regülasyon farklılıkları
- Emzirme, bebeklik döneminde TC ve LDL ↑
- Yetişkinlikte ise daha düşük seviyelerle ilişkili
- Yetişkin yaşamda AS formulaya göre daha düşük TC
- **≥1 yıl emzirme TC&LDL seviyelerine daha iyi etkili**

TABLE 1. Continued

Reference	Year	Study Type	Source	Year Born	Age Measured	No. Breast, Bottle	Gender	Feeding Practices Recorded	Formula Type/ Comments	Exclusive Infant Feeding Groups	MD in TC mmol/L (SE)
Plancoulaine[46]	2000	C	From previous pre- and primary school phases	1981 to 1987?	5–11 y 5–11 y	111, 131 101, 118	M F	PQ	SF	No, Br F group included those who were also FF	−0.3 (0.13) 0 (0.16)
Hodgson[68]	1976	C	Questionnaire respondents from a child clinic	1962 to 1975	7–12 y 7–12 y	12, 10 18, 10	M F	PQ in infancy and medical records	SF (group fed cow milk excluded)	Yes, exclusively Br F or FF for the first 3 mo	0.54 (0.34) 0.23 (0.27)
Hromadová[47]	1997	C	Unknown	Not stated	12–13 y	44, 13	All	In infancy	FF not stated (2 Br F groups combined)	No, exclusiveness of Br F not stated, FF group Br F for first 1 mo	−0.09 (0.27)
Ten Towns‡	2001	Mixed C	School Heart Health Study	1982 to 1986	13–16 y 13–16 y	330, 289 290, 254	M F	PQ	SF	Yes, exclusively Br F or FF for the first 3 mo	0.01 (0.06) −0.05 (0.07)
Kolacek[41]§	1993	C	Three regions of Croatia	1968 to 1989	18–23 y 18–23 y	35, 17 52, 14	M F	In infancy	27% FF, 73% fed diluted cow milk	Yes, exclusively Br F or FF for the first 3 mo	−0.2 (0.32) −0.2 (0.31)
Leeson[63]	2001	X	Born in a maternity hospital	1969 to 1975	20–28 y	149, 182	All	Maternal recall	SF	Yes, Br F or FF only, but minimum duration of feeding not given	−0.18 (0.11)
Marmot[33]¶	1980	C	National Survey for Health	1946	31–32 y 31–32 y	57, 20 68, 27	M F	In infancy	SF	Yes, exclusively Br F for the first 5 mo of life, FF group not Br F	−0.1 (0.25) −0.5 (0.23)
Ravelli[9]	2000	C	Dutch Famine Birth Cohort	1943 to 1947	48–53 y	520, 105	All	Postnatal medical records	Bottle-fed	No, FF partly Br F, feeding status recorded on average 10.4 d after birth	−0.16 (0.11)
Fall[8,34]§	1992 1995	C	Adults born in Hertfordshire	1920 to 1930	59–70 y 60–71 y	344, 25 208, 11	M F	Birth records	FF not stated (2 Br F groups combined)	Yes, exclusively Br F or FF, Br F group divided into weaned and not weaned	−0.32 (0.25) 0.12 (0.43)

Author, year (reference)	Study design	Year of birth of subjects	Age at cholesterol measuremer	Gender	Comparison groups	Mean differe total cholest mmol/L (SE)
Kolacek 1993 (100)	Cohort	1968-9	18-23 years	Male Female	Exclusively breastfed (n=35) vs. Formula fed (n=17) Exclusively breastfed (n=52) vs. Formula fed (n=14)	-0.2 (SE 0.3 -0.2 (SE 0.3
Leeson 2001 (75)	Cross-sectional	1969-75	20-28 years	All	Any breastfeeding (n=149) vs. Exclusively bottle fed (n=182)	-0.18 (SE 0.
Marmot 1980 (30)	Cohort	1946	31-32 years	Male Female	Exclusively breastfed for 5 months (n=57) vs. Exclusively formula fed (n=20) Exclusively breastfed for 5 months (n=68) vs. Exclusively formula fed (n=27)	-0.1 (SE 0.2 -0.5 (SE 0.2
Ravelli 2000 (77)	Cohort	1943-7	48-53 years	All	Exclusively breastfed (n=520) vs. Partly or exclusively bottle fed (n=105) in the first 10 days	-0.16 (SE 0.
Martin 2005 (58)	Cohort	1918-39	63-82 years	Male	Breastfed (n=272) vs. Bottle fed (n=90)	0.12 (SE 0.2
Fall 1992 (101)	Cohort	1920-30	59-70 years	Male	Exclusively breastfed (n=344) vs. Formula fed (n=25)	-0.32 (SE 0.
Fall 1995 (79)	Cohort	1920-30	60-71 years	Female	Exclusively breastfed (n=208) vs. Formula fed (n=11)	0.12 (SE 0.4

Pediatrics **2002**, *110*, 597–608

WHO Library Cataloguing-in-Publication Data

Evidence on the long-term effects of breastfeeding : systematic review and meta-analyses / Bernardo L. Horta ... [et al.].

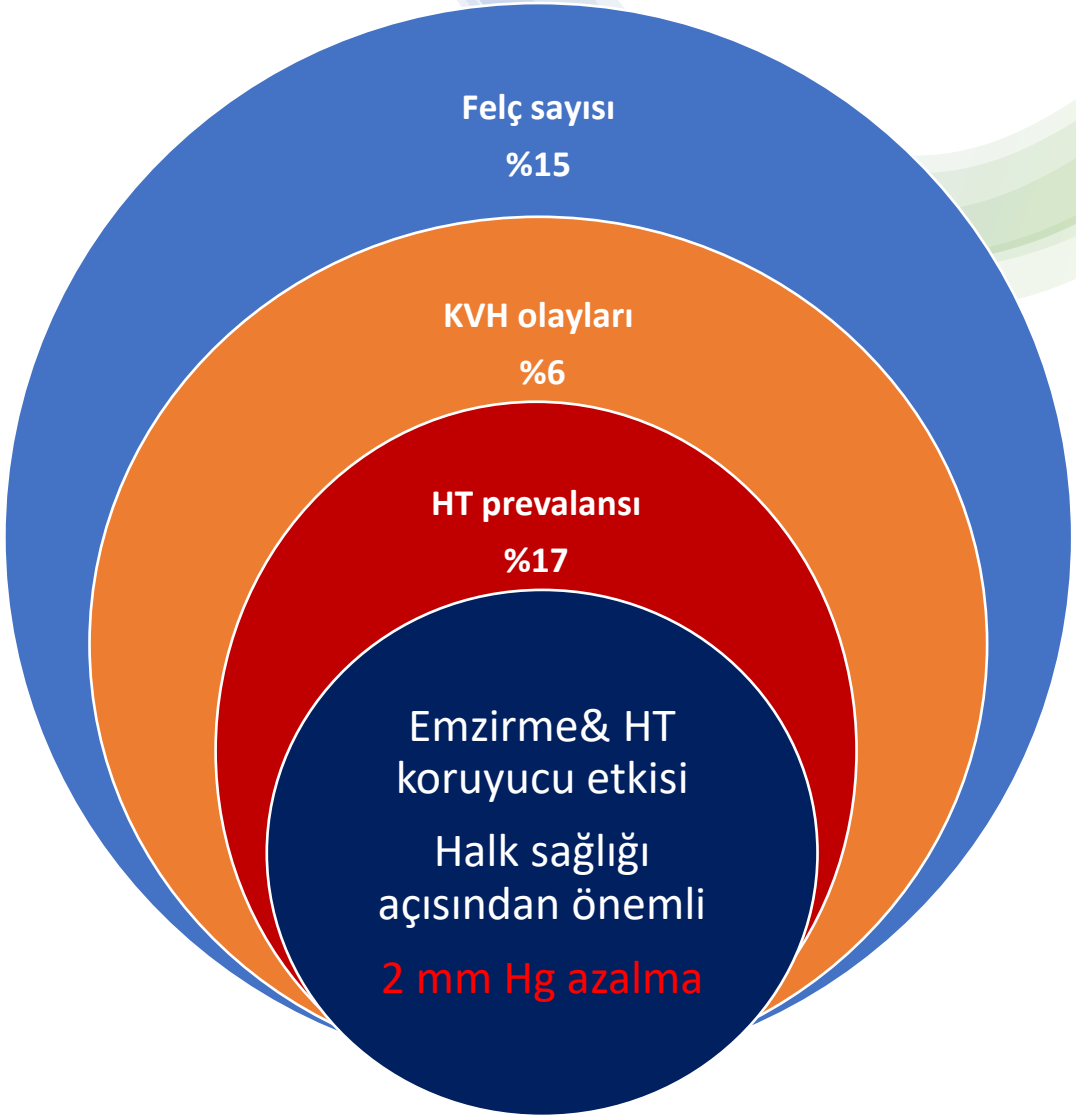
1.Breast feeding. 2.Blood pressure. 3.Diabetes mellitus. 4.Cholesterol. 5.Obesity. I.Horta, Bernardo L. II.World Health Organization.

Emzirme& KB/Metaanaliz
SKB&DKB

küçük ama önemli koruyucu etkileri

Table 1.3. Breastfeeding and blood pressure in later life: Random-effects meta-analyses by subgroups

Subgroup analysis	Systolic blood pressure			Diastolic blood pressure		
	Number of estimates	Mean difference (95% confidence interval)	P value	Number of estimates	Mean difference (95% confidence interval)	P value
By age group						
1 to 9 years	14	-1.06 (-1.70 to -0.42)	0.04	11	-0.54 (-1.27 to 0.19)	0.14
9 to 19 years	8	-1.81 (-3.13 to -0.50)	0.007	6	-0.53 (-1.22 to 0.17)	0.14
>19 years	8	-0.95 (-1.97 to 0.07)	0.07	8	-0.38 (-0.90 to 0.15)	0.16
By study size						
<300 participants	10	-2.45 (-3.52 to -1.38)	0.001	9	-0.87 (-1.83 to 0.08)	0.07
300-999 participants	11	-1.52 (-2.80 to -0.23)	0.02	9	-0.59 (-1.71 to 0.52)	0.30
≥1000 participants	9	-0.59 (-1.00 to -0.19)	0.004	7	-0.33 (-0.61 to -0.04)	0.02
By year of birth of subjects						
Before 1980	13	-1.42 (-2.44 to -0.39)	0.007	11	-0.40 (-0.78 to -0.02)	0.04
After 1980	16	-1.03 (-1.61 to -0.45)	0.001	13	-0.61 (-1.27 to 0.04)	0.06
By length of recall of breastfeeding						
<3 years	19	-1.23 (-1.63 to -0.82)	0.001	14	-0.59 (-0.94 to -0.23)	0.001
≥3 years	11	-1.01 (-1.97 to -0.06)	0.04	10	-0.36 (-1.02 to 0.30)	0.28
By categorization of breastfeeding						
Ever breastfed	14	-0.83 (-1.35 to -0.32)	0.002	13	-0.49 (-0.89 to -0.10)	0.01
Breastfed for a given number of months	16	-1.42 (-2.22 to -0.63)	0.001	12	-0.47 (-1.10 to 0.16)	0.14
By control for confounding						
None	11	-1.73 (-3.17 to -0.30)	0.02	9	-0.59 (-1.39 to 0.22)	0.15
Adjusted for socioeconomic status	12	-0.92 (-1.71 to -0.14)	0.02	12	-0.44 (-1.04 to 0.17)	0.16
Adjusted for socioeconomic and demographic variables	7	-1.19 (-1.70 to -0.69)	0.001	4	-0.61 (-1.12 to -0.10)	0.02
Study setting						
High-income country	26	-1.15 (-1.68 to -0.62)	0.001	22	-0.54 (-0.95 to -0.14)	0.009
Middle/Low-income country	4	-1.93 (-3.61 to -0.26)	0.02	3	0.13 (-1.12 to 1.37)	0.20
Total	30	-1.21 (-1.72 to -0.70)		25	-0.49 (-0.87 to -0.11)	



BMJ 2003;327(7425):1189-95
ISBN: 9789241595230

Immediate Postnatal Growth Is Associated With Blood Pressure in Young Adulthood

The Barry Caerphilly Growth Study

Yoav Ben-Shlomo, Anne McCarthy, Rachael Hughes, Kate Tilling, David Davies, George Davey Smith

Table 1. Basic Descriptive Data on Anthropometric Measures and Adult Blood Pressure by Gender

	Men (n=362)			Women (n=318)		
Variable	Mean	SD	Range	Mean	SD	Range
Weight, kg						
Birth	3.44	0.49	1.99 to 4.86	3.30	0.51	1.88 to 4.69
3.0 mo	6.42	0.73	4.10 to 8.82	5.83	0.66	3.90 to 7.64
1.5 y	12.1	1.3	8.64 to 16.3	11.3	1.2	7.88 to 14.9
5.0 y	19.1	2.3	13.5 to 31.0	18.6	2.3	11.0 to 26.4
Adult measures						
Age, y	25	0.7	23 to 27	25	0.7	23 to 26.8
SBP, mm Hg	123.5	11.1	100 to 169	108.0	9.4	86 to 144
DBP, mm Hg	71.5	7.6	55 to 93	68.3	7.1	53 to 102
Waist:hip ratio, ×100	83.5	5.1	71.2 to 101.8	71.2	6.0	60.6 to 95.6

- ✓ n: 680 /Doğum, 3.ay, 1.5 yaş, 5 yaş, 25 yaş
- ✓ Doğum ağırlığı ve doğum sonrası hızlı tartı alımı sistolik kan basıncı ile orantılı
- ✓ Term doğanlarda hızlı büyüme diyastolik kan basıncı ile de orantılı

Table 2. Association Between Birth Weight and Weight in Infancy and Childhood (*z* Score) With Adult SBP and DBP

	Model 1 (n=623)†			Model 2 (n=567)			Model 3 (n=480)			Model 4 (n=474)		
Variables	β Coefficient	95% CI	*P*	β Coefficient	95% CI	*P*	β Coefficient	95% CI	*P*	β Coefficient	95% CI	*P*
SBP, mm Hg												
Birth weight*	−0.94	−1.77 to −0.11	0.03	−1.61	−2.60 to −0.61	0.002	−1.47	−2.57 to −0.37	0.009	−1.22	−2.34 to −0.11	0.03
Weight at 3.0 mo	0.21	−0.60 to 1.02	0.61	0.70	−0.42 to 1.82	0.22	0.47	−0.79 to 1.72	0.46	0.37	−0.87 to 1.61	0.56
Weight at 1.5 y	0.34	−0.46 to 1.15	0.40	−0.07	−1.35 to 1.21	0.92	0.44	−0.98 to 1.85	0.55	0.29	−1.12 to 1.69	0.69
Weight at 5.0 y	0.77	−0.03 to 1.57	0.06	0.97	−0.24 to 2.19	0.12	0.76	−0.66 to 2.18	0.29	0.72	−0.68 to 2.12	0.31
DBP, mm Hg												
Birth weight*	−0.47	−1.06 to 0.11	0.11	−0.81	−1.51 to −0.12	0.02	−0.85	−1.63 to −0.08	0.03	−0.60	−1.38 to 0.17	0.13
Weight at 3.0 mo	0.21	−0.35 to 0.77	0.46	0.74	−0.04 to 1.53	0.06	0.56	−0.33 to 1.44	0.22	0.50	−0.37 to 1.36	0.26
Weight at 1.5 y	0.02	−0.55 to 0.58	0.96	−0.18	−1.08 to 0.73	0.70	0.07	−0.93 to 1.07	0.88	−0.04	−1.02 to 0.94	0.94
Weight at 5.0 y	0.09	−0.47 to 0.64	0.75	0.11	−0.74 to 0.97	0.79	0.11	−0.89 to 1.11	0.83	0.02	−0.95 to 1.00	0.96

Hypertension. 2008;52:638-644

Kan Şekeri ve Tip II Diyabet

- İskelet kası değişikliklerin insülin direnci gelişiminde önemli
- Açlık glukozu iskelet kası uzun zincirli çoklu doymamış yağ asitleri ile ters orantılı
- Emzirme, iskelet kasında daha yüksek LCPUFA seviyeleri, daha düşük açlık glukozu

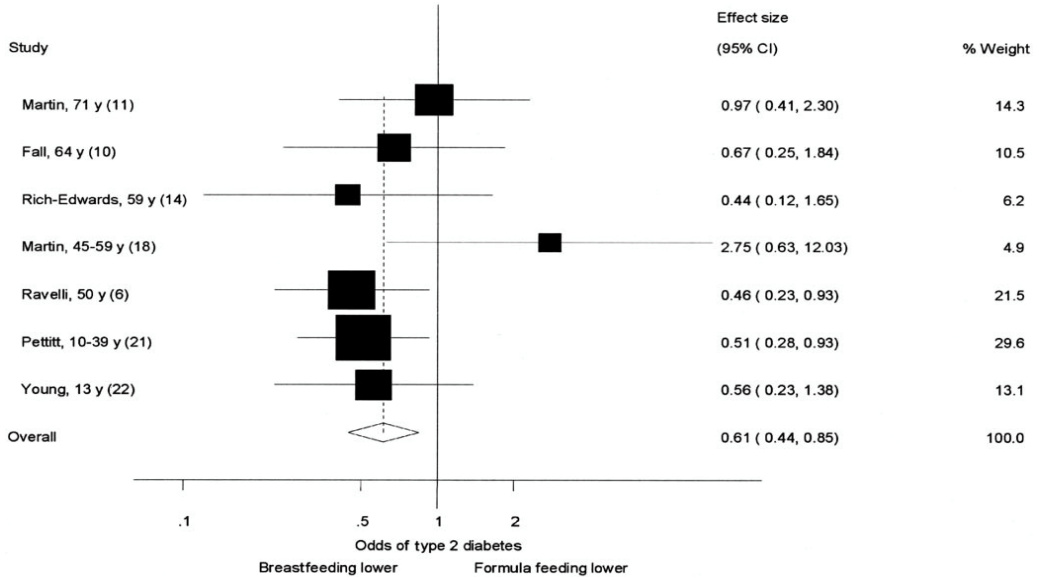
Owen ve ark.
Metaanaliz /1010 çalışmadan /25 uygun/ 6 çalışma

Emzirme ve erişkin Tip 2 DM
Emzirme ilişkili diyabetin popülasyondaki oranı %5

AS & erişkinde daha düşük insülin
Tip 2 diyabet riskinde azalma

TABLE 2
Overall pooled differences for blood glucose, serum insulin, and odds of type 2 diabetes from studies conducted in infants, children, and adults: comparison between breastfed and formula-fed subjects[1]

Variable	No. of studies	No. of subjects breastfed, formula fed	Mean difference: Blood glucose	Mean difference: Serum insulin	OR of type 2 diabetes	*P* for difference between breastfed and formula fed	*P* for test for heterogeneity[2]
			mmol/L				
Glucose							
Infants	12	290, 270	−0.17 (−0.28, −0.05)[3]	—	—	0.005	0.169
Children and adults	7	4067, 1194	−0.01 (−0.04, 0.03)	—	—	0.679	0.245
Insulin							
Infants	7	140, 151	—	−2.86 pmol/L (−5.76, 0.04)	—	0.054	0.012
Children and adults	6	3855, 945	—	−3% (−8%, 1%)	—	0.127	0.402
Type 2 diabetes							
	7[4]	49 772, 26 972	—	—	0.61 (0.44, 0.85)	0.003	0.383
	5[5]	2579, 953	—	—	0.59 (0.40, 0.87)	0.008	0.280



J Clin Nutr 2006 ;84(5):1043-54

Early-Life Nutrition Interventions and Associated Long-Term Cardiometabolic Outcomes: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Siran He[1] and Aryeh D Stein[2]
[1] Nutrition and Health Sciences Program, Laney Graduate School, Emory University, Atlanta, GA, USA; and [2] Rollins School of Public Health, Emory University, Atlanta, GA, USA

- ✓ AS veya düşük proteinli formülle düşük protein alımı, yaşamın ilerleyen dönemlerinde daha az obezite
- ✓ Daha hızlı erken büyüme, normal ve DDA bebeklerde insülin direnci
- ✓ ilk 6 ayda daha hızlı kilo alımı, ergenlerde metabolik risk puanı (TG, HDL, glukoz, insülin, bel çevresi, KB) artışı
- ✓ Çocukluk boyunca daha hızlı kilo alımı yetişkinlikte obezite riski

KVH risk faktörü

Review > J Am Coll Nutr. 2004 Dec;23(6 Suppl):588S-595S.
doi: 10.1080/07315724.2004.10719428.

The developmental origins of adult disease

Weight (pounds)	Death from Coronary Heart Disease	
	Before 65 Years	All Ages
Birthweight:		
≤5.5 (n = 486)	1.50 (0.98 to 2.31)	1.37 (1.00 to 1.86)
−6.5 (n = 1385)	1.27 (0.89 to 1.83)	1.29 (1.01 to 1.66)
−7.5 (n = 3162)	1.17 (0.84 to 1.63)	1.14 (0.91 to 1.44)
−8.5 (n = 3308)	1.07 (0.77 to 1.49)	1.12 (0.89 to 1.40)
−9.5 (n = 1564)	0.96 (0.66 to 1.39)	0.97 (0.75 to 1.25)
≥10 (n = 731)	1.00	1.00
p for trend	0.001	0.005
One year old:		
≤18 (n = 715)	2.22 (1.33 to 3.73)	1.89 (1.34 to 2.66)
−20 (n = 1806)	1.80 (1.11 to 2.93)	1.58 (1.15 to 2.16)
−22 (n = 3404)	1.96 (1.23 to 3.12)	1.66 (1.23 to 2.25)
−24 (n = 2824)	1.52 (0.95 to 2.45)	1.36 (1.00 to 1.85)
−26 (n = 1391)	1.36 (0.82 to 2.26)	1.29 (0.93 to 1.78)
≥27 (n = 496)	1.00	1.00
p for trend	<0.001	<0.001

1924–1944 Helsinki Üniversite Hastanesi,
n: 13 517 doğum ve çocukluk dönemi verileri

3- 11 yaş arasında VKI kontrolü
KVH E%25, K %63 azalma

*AdvNutr*2021;12:461–489.

Proc Nutr Soc 2009;68(4):422-9

J Nutr 2016;146:2361– 2367

J Am Coll Nutr. 2004;23:588-595
Int J Epidemiol 2002;31(6):1235-9.
Int J Obes 2016;40:1018–1025.

nutrients

MDPI

Article

Achievement of the Targets of the 20-Year Infancy-Onset Dietary Intervention—Association with Metabolic Profile from Childhood to Adulthood

STRIP ÇALIŞMASI

199-2011
Finlandiya/ Turku

7 ay-20 yaş /n:1062

Ateroskleroz risk faktörleri prospektif, randomize kontrollü çalışma

E & %10-15'i Pr
%50-60'ı KH
%30 yağ
Kontr. G müdahale yok

Diyet hedef puanı, STRIP diyet müdahale hedefleri

1) SFA/ (MUFA + PUFA) < 1:2,
2) SFA < %10 E
3) diyet lifi
4) sukroz alımı
5)diyet kolesterolü

Bebeklikten erken erişkinliğe kadar verilen diyet müdahalesi kontrol grubuna göre yağ asidlerini düzenlemekte

Diyet hedeflerine bağlılık, daha düşük kardiyo-metabolik risk

Symposium on 'Early nutrition and later disease: current concepts, research and implications'

Early nutrition and long-term health: a practical approach

- Bebek büyümesi & ateroskleroz risk faktörleri bağlantılı
- Çok hızlı bebek büyümesi
- Metabolik sendrom (Bozulmuş glukoz toleransı, obezite, hipertansiyon, dislipidemi)
- Kardiyovasküler morbidite
- KVH birincil önlenmesi yaşamın ilk aylarından itibaren başlaması gerektiğini düşündürmekte

Proc Nutr Soc 2009;68(4):422-9

Bebeklerin hızlı büyümesi zararlı

miyokardiyal ve serebrovasküler olaylar insidansını azaltma

Hızlı erken büyüme, aterosklerotik hastalık riskini doğrudan artırmakta

Aterosklerotik sürecin erken evresi endotel disfonksiyonu, yaşamın ilk 2 haftasında ve ergenlerde en fazla

İlk haftalarda çok hızlı kilo alımı ilk 2 yılda ise obezite riski %60
Erişkinlikte >%30 obezite riski

Erken büyüme hızlanmasının endotel fonksiyonu üzerindeki etkisi, yetişkinlerde sigara içmenin veya insüline bağımlı diyabetin etkisine benzer

Proc Nutr Soc 2009;68(4):422-9

Acta Paediatr 2006; 95: 904–908.

Fazla kilolu bebek aşırı kilolu çocuk, ergen ve yetişkin olma olasılığı daha yüksek !!!!

- Erken çocuklukta daha fazla beslenme , yüksek leptin ve yüksek insülin

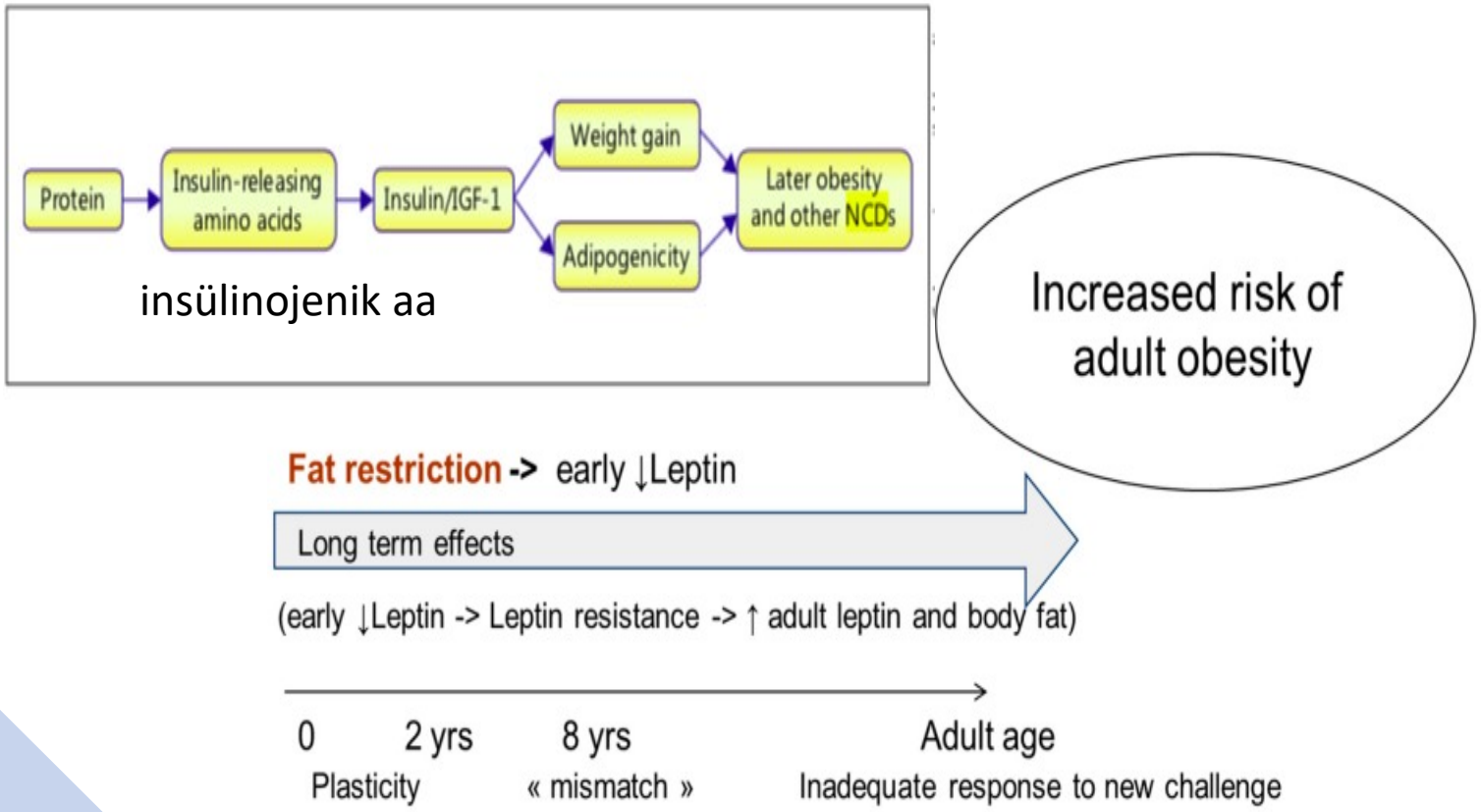
  - ✓ yaşamın ilerleyen dönemlerinde daha yüksek hormon konsantrasyonlarına zemin hazırlayarak tokluk sinyalleri eşiğini yükseltir

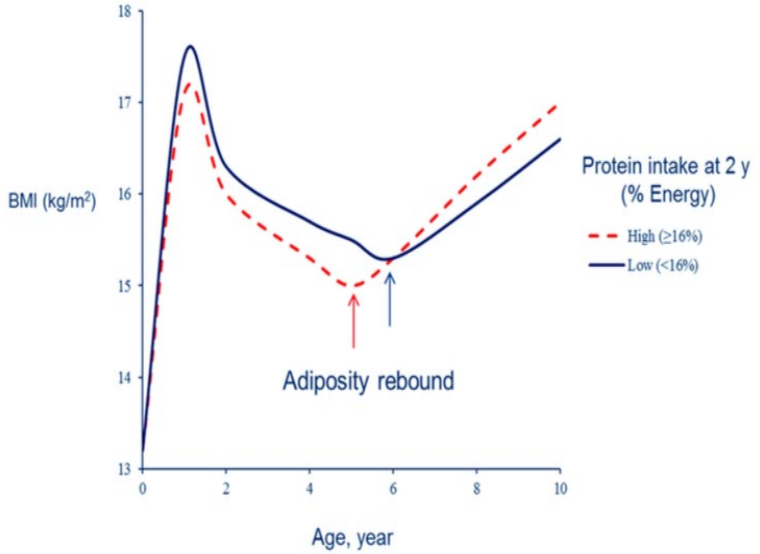
- Erken büyüme hızlanması metabolizmayı ve yağlanmayı düzenleyen hormonal eksenleri kalıcı etkilemekte

- İlk 2 yılda ve okul öncesi daha yüksek protein alımı, özellikle daha sonraki yaşlarda obezite riski
- Okul öncesi çocukların diyetini optimize etmek, daha sonraki obezitenin önlenmesi için kritik

Am J Clin Nutr 2014;99:718–722

Fazla Protein Zararlı



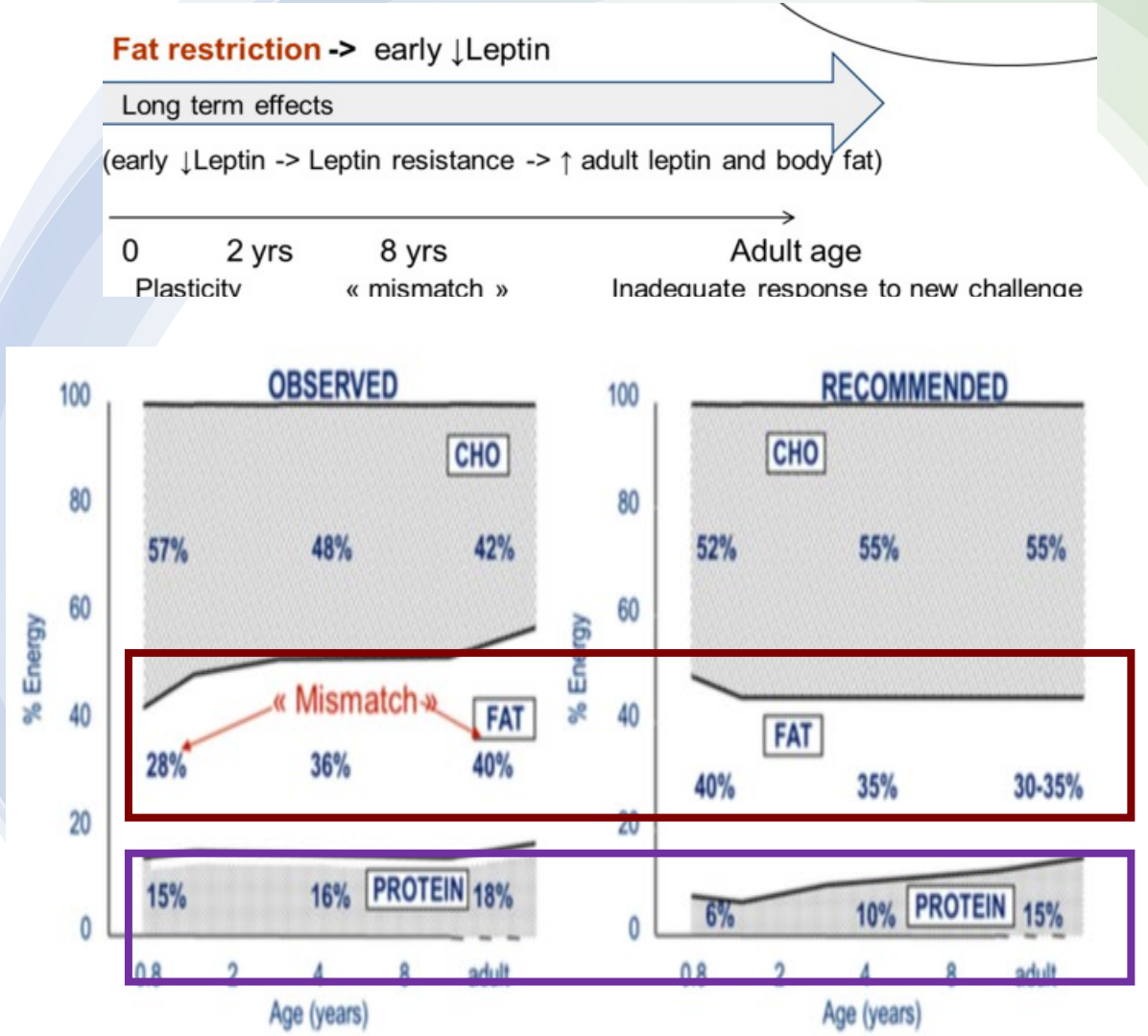


ilk 2 yıl boyunca yüksek protein alımı, yetişkinlik döneminde daha yüksek VKI

Nestle Nutr Inst Workshop Ser. 2019;90:107-120
Int J Environ Res Public Health. 2016;13(6):564
Ann Nutr Metab 2017;70:161–169
Food Nutr Res. 2013; 23:57

Erken dönem düşük yağ alımı &yetişkinlikte fazla kilolu olma

- Erken dönemde düşük ve daha sonra yüksek yağ alımı arasındaki “uyumsuzluk” obezite ve metabolik hastalıkların gelişimini teşvik
- Yaşamın erken döneminde lipid alımı ile vücut yağındaki artış arasında ters ilişki,
- ilk 2 yılda yüksek yağ tüketiminin zararlı olmadığı vurgulanmakta



Int J Environ Res Public Health. 2016;13(6):564

Int J Obes 2016;40:1018–1025.

ORIGINAL ARTICLE

Association of nutrition in early life with body fat and serum leptin at adult age

20 yıl /prospektif /n:73

- ✓ 2 yılda yağdan gelen %1'lik bir enerji artışı,20 yaşta daha az subskapular deri kıvrım kalınlığı
- ✓ daha az yağlı kitle ve daha düşük serum leptini
- ✓ Erken yaşta yağ alımı, vücut yağı (öz.gövde) ve 20 yaşında serum leptin konsantrasyonu ile negatif ilişkili
- ✓ Erken düşük yağ alımı ileri yaşlarda aşırı kilo ve leptin direnci geliştirme duyarlılığını arttırmakta

Table 1. Gender-specific body characteristics and hormonal status among the 73 participants of the ELANCE French longitudinal study

	Mean (s.d.)	*Mean(s.d.)*	*P-value*[a]
Measurement at birth	*Boys (N = 40)*	*Girls (N = 33)*	
Birth weight (kg)	3.3 (0.51)	3.1 (0.5)	0.22
Length at birth (cm)	49.7 (1.7)	48.8 (2.4)	0.09
Measurement at 20 years	*Men (N = 40)*	*Women (N = 33)*	
Anthropometry			
Weight (kg)	71.9 (12.1)	56.4 (10.6)	<0.001
Height (m)	1.79 (0.06)	1.63 (0.07)	<0.001
BMI ($kg\,m^{-2}$)	22.5 (3.7)	21.2 (3.1)	0.10
Subscapular skinfold (mm)	14.4 (7.8)	17.6 (8.5)	0.035[b]
Triceps skinfold (mm)	11.9 (5.3)	17.5 (6.0)	<0.001
Bioelectrical impedance analysis			
Fat-free mass (kg)	62.6 (7.7)	42.9 (4.4)	<0.001
Fat mass (kg)	9.3 (5.9)	13.5 (7)	0.007
Hormonal status			
Leptin ($\mu g\,l^{-1}$)	3.8 (3.6)	11.4 (4.1)	<0.001

Int J Obes 2013; 37:1116–1122

- Tamamlayıcı gıdalar, beslenme açısından ihtiyaç duyulduğunda ve bebek buna hazır olduğunda emzirmeye "tamamlayıcı" olmalı
- 17- 26 hafta arası ideal

- 7-42 yıllık takip çalışmaları
- Tamamlayıcı beslenme başlama yaşı ile yağlanma riski arasında ters bir ilişki

Annals of Nutrition & Metabolism

Ann Nutr Metab 2012;60(suppl 2):8–20
DOI: 10.1159/000336287

Published online: April 30, 2012

Timing of Introduction of Complementary Food: Short- and Long-Term Health Consequences

Hildegard Przyrembel*

Berlin, Germany

Ann Nutr Metab 2012;60:8–20

BMJ Open **Body mass index in school-aged children and the risk of routinely diagnosed non-alcoholic fatty liver disease in adulthood: a prospective study based on the Copenhagen School Health Records Register**

- Danimarka &Kopenhag
- Prospektif
- 1930 -1989 yılları arasında doğan
- 244 464 okul çocuğu
- Okul kayıt sistemi & NAYKH kayıt sistemi

- 7 -13 yaş arasındaki VKI z-skoru, ♀/♂ NAYKH (+) ilişkili
- 7 yaşındaVKI z-skoru 1 birim artış E/K 1.15 /1.16 erişkin NAYKH

Table 2 Routinely diagnosed non-alcoholic fatty liver disease given as numbers and age at diagnosis

	Men		Women	
	n	Age (years) at diagnosis given as median (5 and 95 centiles)	n	Age (years) at diagnosis given as median (5 and 95 centiles)
First incidence of non-alcoholic				
Steatosis	580	52.8 (32.0 to 69.3)	606	55.8 (38.1 to 68.4)
Steatohepatitis	428	53.9 (30.2 to 70.8)	375	54.8 (30.6 to 70.5)
Fibrosis	193	55.4 (33.4 to 71.3)	149	54.8 (35.6 to 71.1)
Cirrhosis	565	55.6 (38.0 to 70.8)	373	55.8 (40.9 to 70.5)
Total NAFLD*	1264	54.6 (32.9 to 70.3)	1106	55.8 (36.1 to 70.3)

*The total number of non-alcoholic steatosis, steatohepatitis, fibrosis and cirrhosis is larger than the total number of NAFLD cases. The numbers of events are calculated as first incidence, thus, if an individual has more than one of the NAFLD subdiagnoses, he/she will appear in more than one of the NAFLD subcategories.
n, number; NAFLD, non-alcoholic fatty liver disease.

Okul çağındaki çocuklarda
VKI artışı
yetişkin NAYKH ile ilişkili

yetişkin NAYKH gelişiminde
çocuklukta VKI> erişkin VKI
Daha önemli

BMJ 2015;5:e006998.

Research Article

EASL EUROPEAN ASSOCIATION FOR THE STUDY OF THE LIVER | JOURNAL OF HEPATOLOGY

Body mass index in childhood and adult risk of primary liver cancer

Tina Landsvig Berentzen[1], Michael Gamborg[1], Claus Holst[1], Thorkild I.A. Sørensen[1,2], Jennifer L. Baker[1,2,*]

Background & Aims: Childhood overweight increases the risk of early development of non-alcoholic fatty liver disease, which may predispose to carcinogenesis. We investigated if childhood body size during school ages was associated with the risk of primary liver cancer in adults.

Methods: A cohort of 285,884 boys and girls, born 1930 through 1980, who attended school in Copenhagen, were followed from 1977 to 31 December 2010. Their heights and weights were measured by school doctors or nurses at ages 7 through 13 years. Body mass index (BMI) z-scores were calculated from an internal age- and sex-specific reference. Information on liver cancer was obtained from the National Cancer Registry. Hazard ratios and 95% confidence intervals (95% CI) of liver cancer were estimated by Cox regression.

Results: During 6,963,105 person-years of follow-up, 438 cases of primary liver cancer were recorded. The hazard ratio (95% CI) of adult liver cancer was 1.20 (1.07–1.33) and 1.30 (1.16–1.46) per 1-unit BMI z-score at 7 years and 13 years of age, respectively. Similar associations were found in boys and girls, for hepatocellular carcinoma only, across years of birth, and after accounting for diagnoses of viral hepatitis, alcohol-related disorders, and biliary cirrhosis.

Conclusions: Higher BMI in childhood increases the risk of primary liver cancer in adults. In view of the high case fatality of primary liver cancer, this result adds to the future negative health outcomes of the epidemic of childhood overweight, reinforcing the need for its prevention.

Table 4. Hazard ratios (HR) and 95% confidence intervals (CI) of primary liver cancer and hepatocellular carcinoma in adults per 1-unit BMI z-score at each of the ages 7 through 13 years among the children without a registered diagnosis of viral hepatitis, alcohol-related disorders and biliary cirrhosis.

		Primary liver cancer*		Hepatocellular carcinoma	
Characteristic	N	Cases	HR (95% CI)‡	Cases	HR (95% CI)‡
BMI (kg/m²) at 7 yr	263,532	240	1.19 (1.04 to 1.38)	143	1.17 (0.97 to 1.40)
BMI (kg/m²) at 8 yr	267,722	244	1.21 (1.05 to 1.41)	146	1.16 (0.96 to 1.40)
BMI (kg/m²) at 9 yr	262,629	248	1.22 (1.06 to 1.42)	146	1.15 (0.95 to 1.40)
BMI (kg/m²) at 10 yr	257,888	250	1.30 (1.12 to 1.51)	149	1.27 (1.04 to 1.53)
BMI (kg/m²) at 11 yr	256,222	250	1.26 (1.09 to 1.46)	151	1.24 (1.02 to 1.49)
BMI (kg/m²) at 12 yr	253,848	249	1.30 (1.12 to 1.50)	151	1.31 (1.08 to 1.58)
BMI (kg/m²) at 13 yr	250,300	243	1.36 (1.17 to 1.58)	146	1.39 (1.15 to 1.69)

6.963.105 kişi düzenli takip

KC kanseri n: 438 / ort yaş 60 (30-81)

- ✓ okul çağında ♀/♂ VKI fazla ise
- ✓ erişkin KC kanseri riski

J Hepatol 2014;60:325–330

Childhood body mass index and height in relation to site-specific risks of colorectal cancers in adult life

Britt W. Jensen[1] · Michael Gamborg[1] · Ismail Gögenur[2] · Andrew G. Renehan[3] · Thorkild I. A. Sørensen[1,4,5] · Jennifer L. Baker[1,4]

- 1930'dan 1972'ye kadar Kopenhag Okul Sağlığı/
- n: 257.623 çocuk
- 7-13 yaşlarında boy ve tartı takip

- Danimarka Kanser Kayıt Sistemi
- 2676 kolon + 1681 rektal adenokarsinom

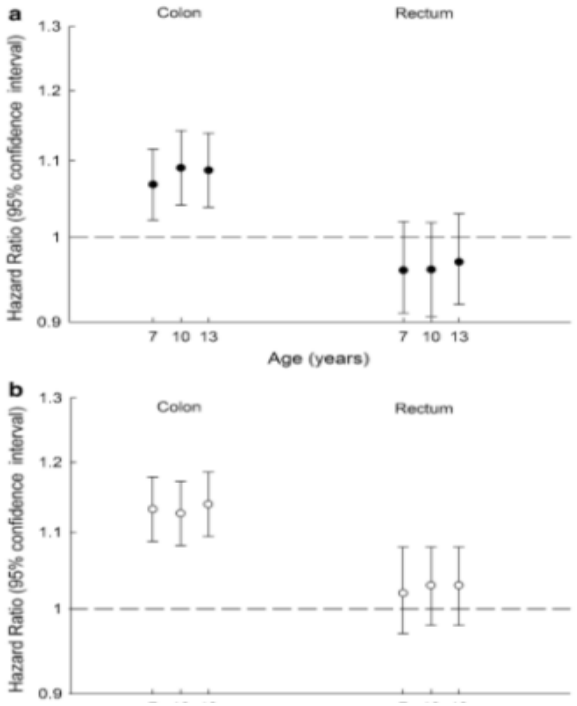


Table 4 Hazard ratios (HR) and 95% confidence intervals (CI) for associations between different patterns of change in BMI and growth in height from age 7 to 13 years and adult cancers of the colon and rectum for men and women[a]

	Colon				Rectum			
	HR	95% CI		*p*	HR	95% CI		*p*
BMI growth patterns								
Average growth[b]	Reference				Reference			
Persistently heavier than average[c]	1.05	1.02	1.07	<0.001	0.9[illegible]	0.95	1.01	0.32
Increasing BMI more than average[d]	1.05	1.02	1.09	0.003	1.01	0.97	1.06	0.59
Deceasing BMI from above average to average[e]	0.99	0.96	1.02	0.70	0.97	0.93	1.01	0.18
Height growth patterns								
Average growth[b]	Reference				Reference			
Persistently taller than average[c]	1.07	1.05	1.09	<0.001	1.02	0.99	1.04	0.26
Growing taller than average[d]	1.06	1.02	1.11	0.003	1.03	0.98	1.09	0.22
Changing from taller than average to average[e]	1.01	0.97	1.05	0.76	0.98	0.93	1.04	0.52

Çocukluk VKI artış → erişkin kolon kanseri riski

Eur J Epidemiol 2017; 32:1097–1106

PEDIATRIC ORIGINAL ARTICLE

Childhood body mass index and height and risk of histologic subtypes of endometrial cancer

J Aarestrup[1], M Gamborg[1], LG Ulrich[2], TIA Sørensen[1,3] and JL Baker[1,3]

BACKGROUND: Endometrial cancer risk factors include adult obesity and taller stature, but the influence of size earlier in life is incompletely understood. We examined whether childhood body mass index (BMI; kg m^{-2}) and height were associated with histologic subtypes of endometrial cancer.

METHODS: From the Copenhagen School Health Records Register, 155 505 girls born 1930–1989 with measured weights and heights from 7 to 13 years were linked to health registers. BMI and height were transformed to age-specific *z*-scores. Hazard ratios (HRs) and 95% confidence intervals were estimated by Cox regressions.

RESULTS: A total of 1020 endometrial cancers were recorded. BMI was non-linearly associated with all endometrial cancers, oestrogen-dependent cancers and the subtype of endometrioid adenocarcinomas; associations were statistically significant and positive above a *z*-score = 0 and non-significant below zero. Compared with a 7-year-old girl with a BMI *z*-score = 0, an equally tall girl who was 3.6 kg heavier (BMI *z*-score = 1.5) had a hazard ratio = 1.53 (95% confidence interval: 1.29–1.82) for endometrioid adenocarcinoma. BMI was not associated with non-oestrogen-dependent cancers, except at the oldest childhood ages. Height at all ages was statistically significant and positively associated with all endometrial cancers, except non-oestrogen-dependent cancers. At 7 years, per ~5.2 cm (1 *z*-score), the risk of endometrioid adenocarcinoma was 1.18 (95% confidence interval: 1.09–1.28). Among non-users of unopposed oestrogens, associations between BMI and endometrioid adenocarcinoma strengthened, but no effects on height associations were observed.

CONCLUSIONS: Endometrial carcinogenesis is linked to early-life body size, suggesting that childhood BMI and height may be useful indicators for the risk of later development of endometrial cancer and might aid in the early prevention of obesity-related endometrial cancers.

International Journal of Obesity (2016) **40,** 1096–1102; doi:10.1038/ijo.2016.56

Supplementary Table 2. Childhood BMI and the risk of all endometrial cancers, oestrogen-dependent cancers and endometrioid adenocarcinomas [a]

				BMI z-score (approximate percentile)[c]														
				-1.5 (7th)		-1.0 (16th)		-0.5 (31st)		0 (50th)	0.5 (69th)		1.0 (84th)		1.5 (93rd)			
Type	Age (years)	N	Cases	HR	95% CI	HR	95% CI	HR	95% CI	HR	HR	95% CI	HR	95% CI	HR	95% CI	P-value[c]
All	7	145 406	952	0.98	0.84-1.16	0.96	0.87-1.05	0.96	0.88-1.04	1.00 (ref.)	1.05	0.97-1.13	1.19	1.09-1.31	1.43	1.24-1.64	0.02
combined	8	147 098	973	0.96	0.80-1.15	0.94	0.85-1.04	0.95	0.88-1.03	1.00 (ref.)	1.05	0.98-1.14	1.22	1.11-1.33	1.47	1.28-1.70	0.02
	9	142 094	975	0.93	0.77-1.13	0.95	0.86-1.05	0.97	0.90-1.05	1.00 (ref.)	1.03	0.95-1.11	1.20	1.09-1.31	1.49	1.28-1.72	0.02
	10	138 587	968	1.00	0.83-1.21	0.94	0.85-1.04	0.92	0.85-1.00	1.00 (ref.)	1.08	1.00-1.17	1.27	1.15-1.39	1.55	1.33-1.80	0.01
	11	137 678	971	0.98	0.81-1.19	0.93	0.85-1.03	0.93	0.86-1.00	1.00 (ref.)	1.08	1.00-1.16	1.28	1.16-1.40	1.60	1.37-1.85	0.004
	12	136 614	967	0.91	0.75-1.11	0.90	0.81-1.00	0.92	0.85-1.00	1.00 (ref.)	1.08	1.00-1.17	1.26	1.15-1.38	1.53	1.31-1.78	0.01
	13	134 707	955	0.86	0.70-1.06	0.88	0.79-0.97	0.92	0.85-0.99	1.00 (ref.)	1.09	1.01-1.18	1.25	114-1.38	1.48	1.28-1.72	0.19
Oestrogen-	7	145 406	861	0.99	0.84-1.18	0.96	0.87-1.06	0.95	0.88-1.03	1.00 (ref.)	1.05	0.97-1.14	1.21	1.10-1.34	1.47	1.27-1.70	0.01
dependent	8	147 098	880	0.99	0.82-1.19	0.96	0.87-1.07	0.96	0.89-1.04	1.00 (ref.)	1.04	0.96-1.13	1.22	1.10-1.34	1.52	1.31-1.76	0.01
	9	142 094	882	0.96	0.79-1.17	0.97	0.87-1.07	0.98	0.90-1.06	1.00 (ref.)	1.03	0.94-1.11	1.21	1.10-1.33	1.53	1.32-1.78	0.01
	10	138 587	873	1.04	0.86-1.26	0.95	0.85-1.05	0.92	0.85-1.00	1.00 (ref.)	1.09	1.00-1.18	1.28	1.16-1.41	1.57	1.34-1.84	0.002
	11	137 678	877	1.02	0.84-1.24	0.94	0.85-1.05	0.92	0.85-1.00	1.00 (ref.)	1.08	1.00-1.17	1.29	1.17-1.42	1.62	1.38-1.89	0.002
	12	136 614	873	0.92	0.75-1.13	0.90	0.81-1.00	0.92	0.84-1.00	1.00 (ref.)	1.09	1.00-1.19	1.26	1.14-1.39	1.50	1.27-1.76	0.09
	13	134 707	859	0.88	0.71-1.08	0.88	0.79-0.98	0.92	0.84-1.00	1.00 (ref.)	1.09	1.00-1.19	1.25	1.13-1.38	1.46	1.24-1.70	0.24
Endometrioid	7	145 406	621	0.96	0.78-1.17	0.91	0.81-1.02	0.91	0.83-1.00	1.00 (ref.)	1.10	1.00-1.21	1.28	1.14-1.43	1.53	1.29-1.82	0.04
adenocarcinoma	8	147 098	632	0.96	0.77-1.19	0.92	0.81-1.03	0.92	0.83-1.01	1.00 (ref.)	1.09	0.99-1.20	1.28	1.15-1.44	1.58	1.34-1.88	0.03
	9	142 094	630	0.92	0.73-1.17	0.91	0.81-1.04	0.93	0.85-1.03	1.00 (ref.)	1.07	0.97-1.18	1.28	1.14-1.43	1.63	1.37-1.93	0.03
	10	138 587	626	1.00	0.79-1.25	0.89	0.79-1.01	0.87	0.79-0.97	1.00 (ref.)	1.14	1.04-1.26	1.36	1.21-1.53	1.67	1.39-2.00	0.01
	11	137 678	630	0.97	0.77-1.22	0.90	0.80-1.02	0.90	0.81-0.99	1.00 (ref.)	1.11	1.01-1.23	1.34	1.19-1.50	1.68	1.40-2.01	0.02
	12	136 614	628	0.88	0.69-1.13	0.85	0.75-0.97	0.88	0.80-0.97	1.00 (ref.)	1.14	1.03-1.26	1.33	1.19-1.50	1.58	1.31-1.90	0.15
	13	134 707	616	0.87	0.69-1.11	0.83	0.73-0.94	0.85	0.77-0.94	1.00 (ref.)	1.17	1.06-1.29	1.35	1.20-1.52	1.53	1.27-1.84	0.17

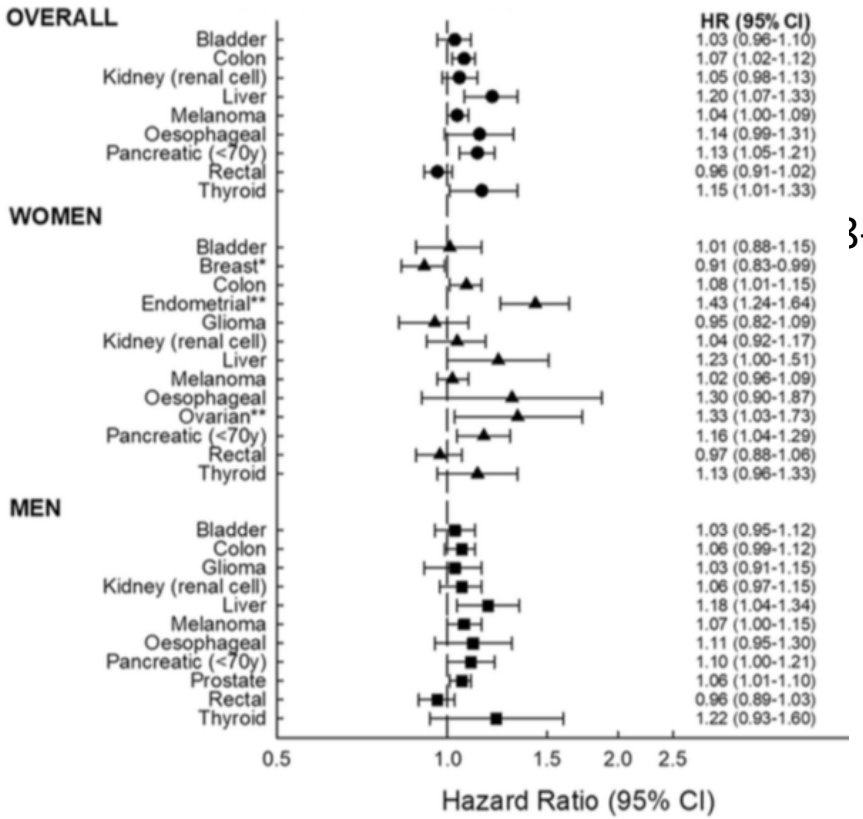
Çocukluk VKI → Östrojen bağımlı endometriyal kanser riski ↑ → ARTAR

Int J Obes 2016 ;40(7):1096-102

REVIEW ARTICLE

Epidemiology and Population Health

Birthweight, childhood overweight, height and growth and adult cancer risks: a review of studies using the Copenhagen School Health Records Register



-2015)

Çocukluk& VKI

mesane (geç çocukluk), kolon, endometriyum, bb, kc, özofagus (geç çocukluk), over, pankreas (<70 yaş) prostat ve tiroid

7-13 yaş çocukluk
VKI & lineer büyüme
Ort. fazla artış
çeşitli kanser
risklerini arttırmakta

Int J Obes (Lond). 2020;44(7):1546-1560

Çocukluk çağı obezitesi

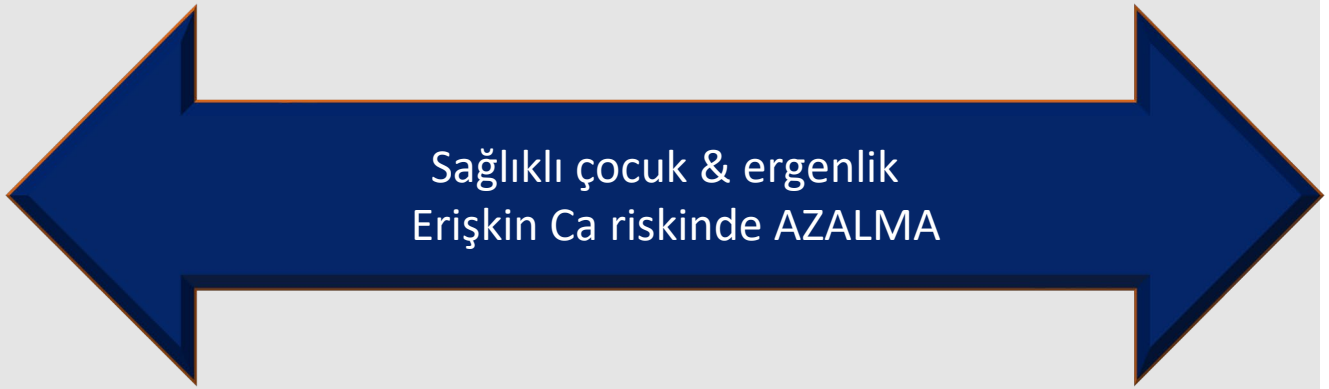
Pankreas Ca

Özofagus Ca

- Çocukluk obezitesi yetişkinlikte morbidite /mortaliteyi arttırmakta
- Çocukluk yüksek VKI + genetik yatkınlık / yetişkinde kanser riski

- 24 Kanser bölgesi ile ilgili çalışmalar
- **Çocukluk VKI 1-SD'lik bir artış**
- **Yetişkinlerde pankreas kanseri riskinde %60**
- **Özofagus kanseri riskinde %47 artış riski**

Causal Association of Childhood Obesity with Cancer Risk in Adulthood: A Mendelian Randomization Study



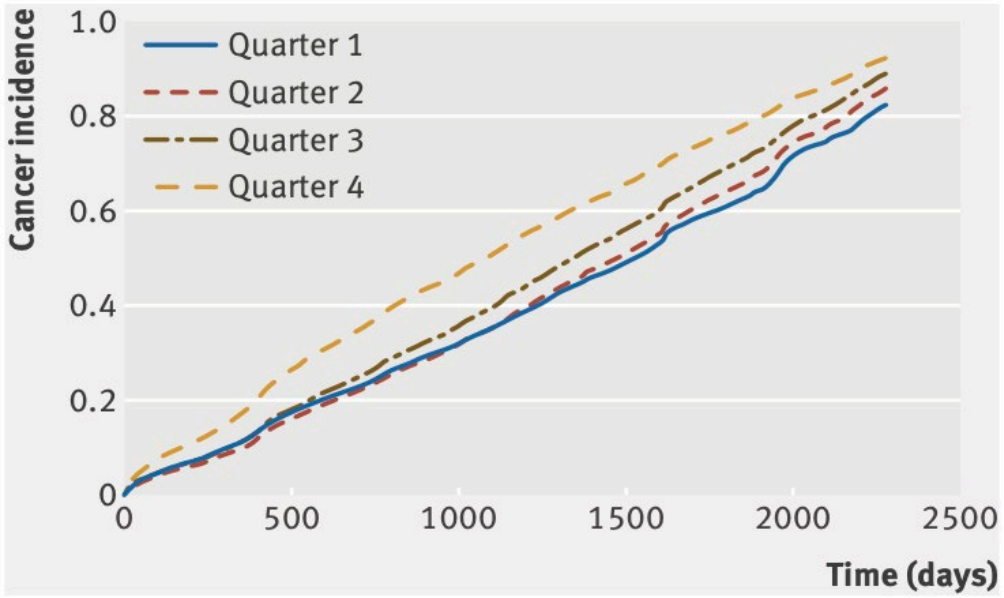
Int J Cancer 2021;149(7):1421-1425.

Consumption of ultra-processed foods and cancer risk: results from NutriNet-Santé prospective cohort

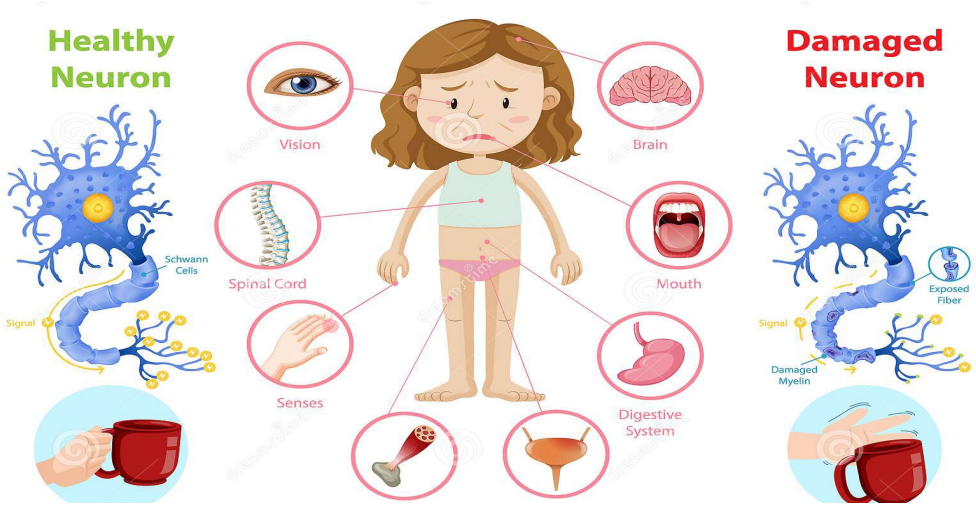
Thibault Fiolet,[1] Bernard Srour,[1] Laury Sellem,[1] Emmanuelle Kesse-Guyot,[1] Benjamin Allès,[1] Caroline Méjean,[2] Mélanie Deschasaux,[1] Philippine Fassier,[1] Paule Latino-Martel,[1] Marie Beslay,[1] Serge Hercberg,[1,4] Céline Lavalette,[1] Carlos A Monteiro,[3] Chantal Julia,[1,4] Mathilde Touvier[1]

- 2009-2017
- n:104.940
- Prospektif kohort çalışma

- Diyetteki ultra işlenmiş gıdanın %10 artışı
- Genel kanser ve meme kanseri riskinde >%10 artış



BMJ. 2018 Feb 14;360:k322.



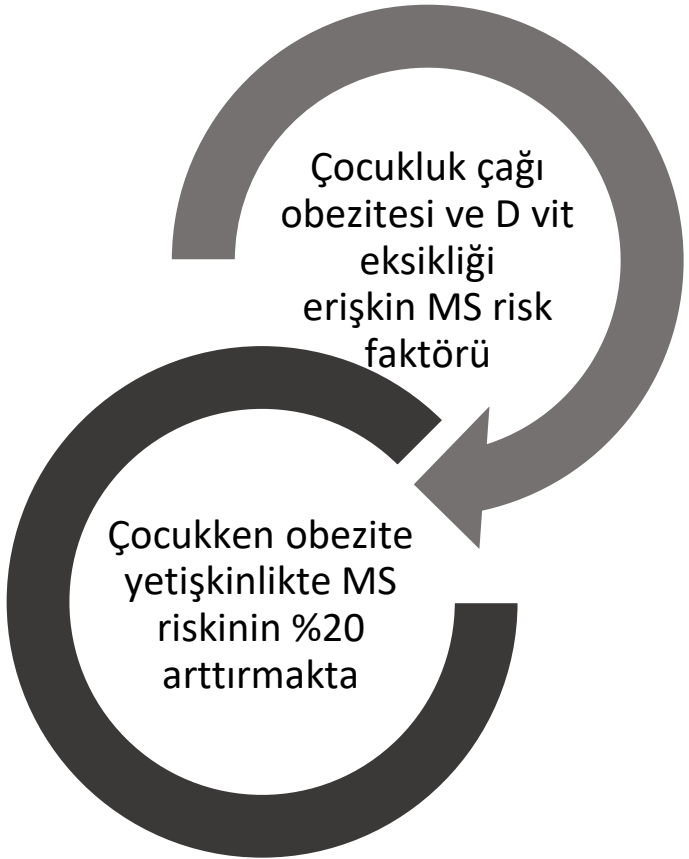


Table 1 Illustrative OR of MS according to BMI or serum vitamin D levels

SDS-BMI (age and gender-specific z score)	BMI at age 10 (F)	OR MS (standardised to BMI 16 at age 10 for females)
−3.5	12 (underweight)	0.53
−0.5	16 (healthy range)	1.00 (reference)
1.2	20 (overweight)	1.42
2.3	24 (obese)	1.77

Adult BMI	OR MS (standardised to OR at BMI 22.5)
18 (underweight)	0.55
22.5 (healthy range)	1.00 (reference)
27.5 (overweight)	1.96
32.5 (obese)	3.84
37.5 (morbidly obese)	7.52

Serum vitamin D (nmol/L)	OR MS (standardised to 10 nmol/L)
10 (severe deficiency)	1.00 (reference)
20 (deficiency)	0.68
40 (insufficient)	0.46
75 (sufficient)	0.33

Neurodegener Dis Manag. 2016
Neurol Neuroimmunol Neuroinflamm 2020;7:e662

An exploratory study of diet in childhood and young adulthood and adult-onset multiple sclerosis

- Çocukluk/ergenlik dönemi diyeti & yetişkin MS
- Yeni başlayan MS'li yetişkin (n = 602) & kontrol(n = 653)
- %84'ü çocukluk &genç yetişkinlikte (6-10, 11-15 ve 16-20 yaş) belirli yaşlar için diyet hatırlaması sağladı
- Meyve ve yoğurt (tüm yaşlar), ve baklagil (11-15 yaş) tüketimi, daha düşük erişkin başlangıçlı MS olasılığı ($p < 0.05$)
- Çocukluk ve genç erişkinlik sağlıklı beslenme alışkanlıkları MS riskini azaltmakta

Mult Scler. 2021; 27(10): 1611–1614.

Early-life famine exposure and rheumatoid arthritis in Chinese adult populations: a retrospective cohort study

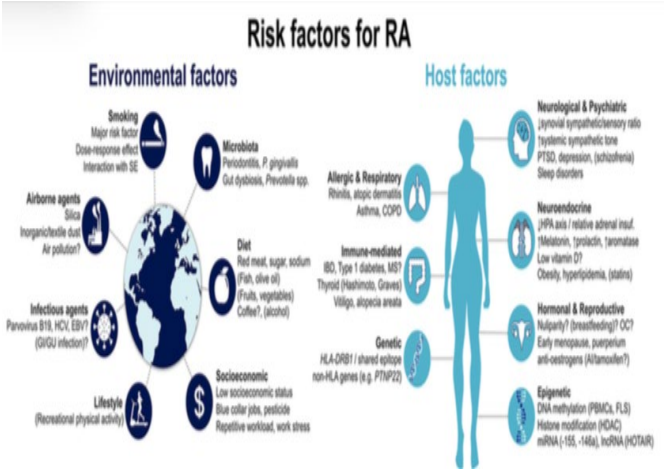
- Fazla doğum ağırlığı (≥ 4000gr)
- İlk 1 yılda fazla kilolu &malnütre olma

yetişkinlikte RA gelişme riski

- Şekerli içecek tüketimi, >55 yaş seropozitif RA riskini %63 arttırmış
- Daha az kırmızı/işlenmiş et ve sodyum RA riskinde azalma

Table 1. Summary of the effect of early life factors on the risk of rheumatoid arthritis (RA).

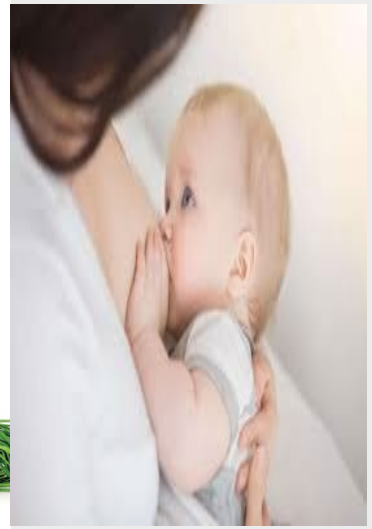
Increased risk of RA	Reduced risk of RA
High birth weight	(Low birth weight)
Maternal smoking in pregnancy	Breast feeding
(Hospitalization for any infection during the first year of life)	Sharing a bedroom in childhood (reduced risk of seropositivity for RF)
	(Preterm birth)



BMJ 2021;**11**:e043416.

Front Med (Lausanne). 2021;689698

Clin Exper Immunol 2010; 163: 11–16




obrigado
Dank U
Merci
mahalo
Köszi
спасибо
Grazie
Thank you
mauruuru
Takk
Gracias
Dziękuję
Děkuju
danke
Kiitos