NUTRICIÓN DE PRECISIÓN EN LA DELGADEZ CONSTITUCIONAL (CT): UNA REVISIÓN NARRATIVA SEGÚN LA ESCALA SANRA

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Research Integrity and Peer Review

METHODOLOGY Open Access

SANRA—a scale for the quality assessment of narrative review articles

Christopher Baethge[1,2*], Sandra Goldbeck-Wood[1,3] and Stephan Mertens[1]

Abstract

Background: Narrative reviews are the commonest type of articles in the medical literature. However, unlike systematic reviews and randomized controlled trials (RCT) articles, for which formal instruments exist to evaluate quality, there is currently no instrument available to assess the quality of narrative reviews. In response to this gap, we developed SANRA, the Scale for the Assessment of Narrative Review Articles.

Methods: A team of three experienced journal editors modified or deleted items in an earlier SANRA version based on face validity, item-total correlations, and reliability scores from previous tests. We deleted an item which addressed a manuscript's writing and accessibility due to poor inter-rater reliability. The six items which form the revised scale are rated from 0 (low standard) to 2 (high standard) and cover the following topics: explanation of (1) the importance and (2) the aims of the review, (3) literature search and (4) referencing and presentation of (5) evidence level and (6) relevant endpoint data. For all items, we developed anchor definitions and examples to guide users in filling out the form. The revised scale was tested by the same editors (blinded to each other's ratings) in a group of 30 consecutive non-systematic review manuscripts submitted to a general medical journal.

Results: Raters confirmed that completing the scale is feasible in everyday editorial work. The mean sum score across all 30 manuscripts was 6.0 out of 12 possible points (SD 2.6, range 1–12). Corrected item-total correlations ranged from 0.33 (item 3) to 0.58 (item 6), and Cronbach's alpha was 0.68 (internal consistency). The intra-class correlation coefficient (average measure) was 0.77 [95% CI 0.57, 0.88] (inter-rater reliability). Raters often disagreed on items 1 and 4.

Conclusions: SANRA's feasibility, inter-rater reliability, homogeneity of items, and internal consistency are sufficient for a scale of six items. Further field testing, particularly of validity, is desirable. We recommend rater training based on the "explanations and instructions" document provided with SANRA. In editorial decision-making, SANRA may complement journal-specific evaluation of manuscripts—pertaining to, e.g., audience, originality or difficulty—and may contribute to improving the standard of non-systematic reviews.

Keywords: Periodicals as topic, Narrative review articles, Non-systematic review articles, SANRA, Agreement, Reliability, Item-total correlation, Internal consistency, Cronbach's alpha, Intra-class correlation coefficient

Baethge C, Goldbeck-Wood S, Mertens S. SANRA-a scale for the quality assessment of narrative review articles. Res Integr Peer Rev. 2019;4:5.

INTRODUCCIÓN

FENOTIPO

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INTRODUCCIÓN

FENOTIPO

G.K. Chesterton

(1874-1936)

-Casi 2 m.

-Glotón.

-Bebedor.

-Fumador.

-Cristiano.

-Tradicionalista.

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INTRODUCCIÓN

FENOTIPO

George Bernard Shaw

(1856-1950)

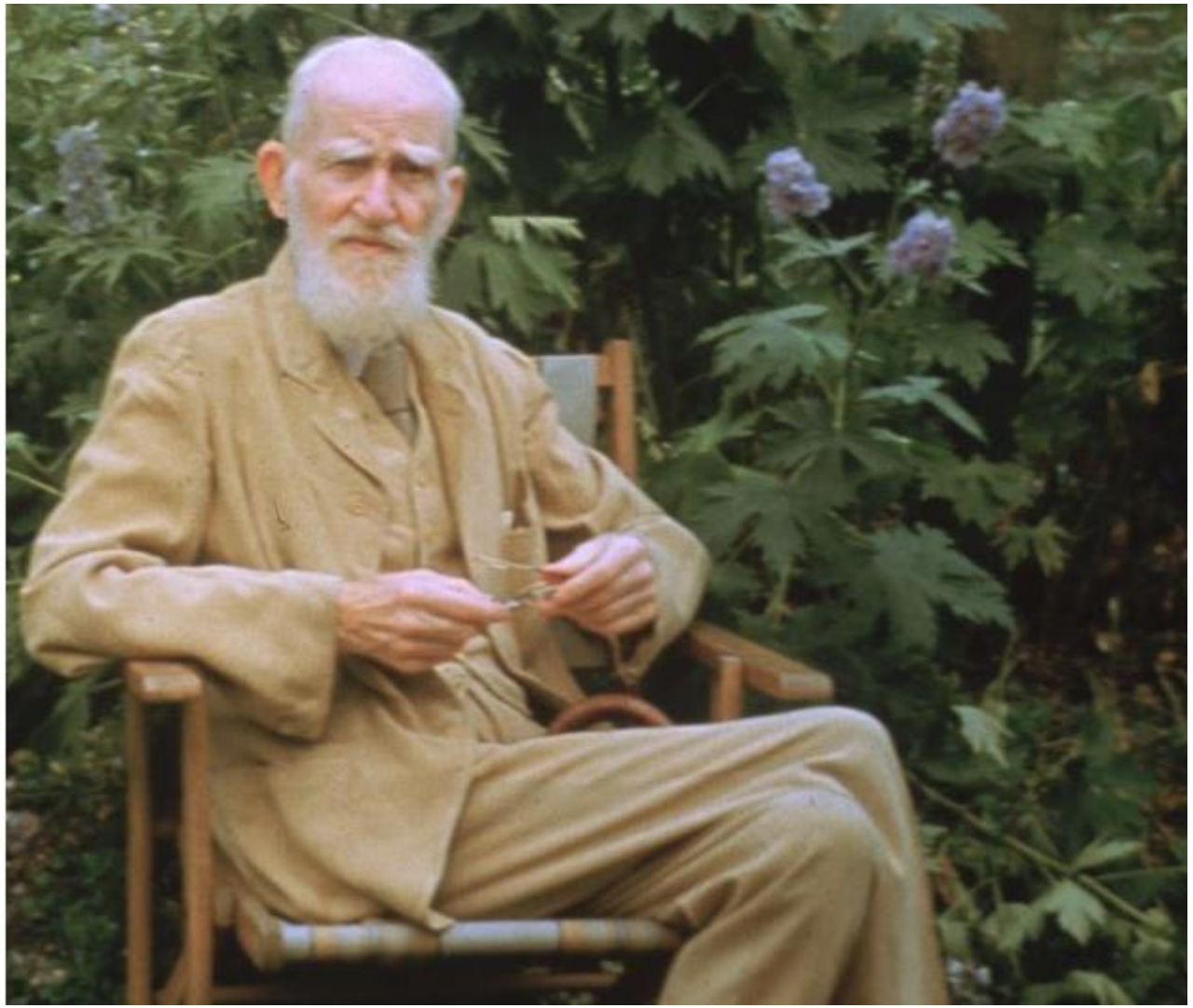
-Delgado.

-Abstemio.

-Vegetariano.

-Progresista.

-Socialista.



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INTRODUCCIÓN

FENOTIPO

Chesterton: "Viéndole parece que Inglaterra haya sufrido una hambruna".

Shaw: "Viéndole, parece que la hambruna la haya causado Ud".

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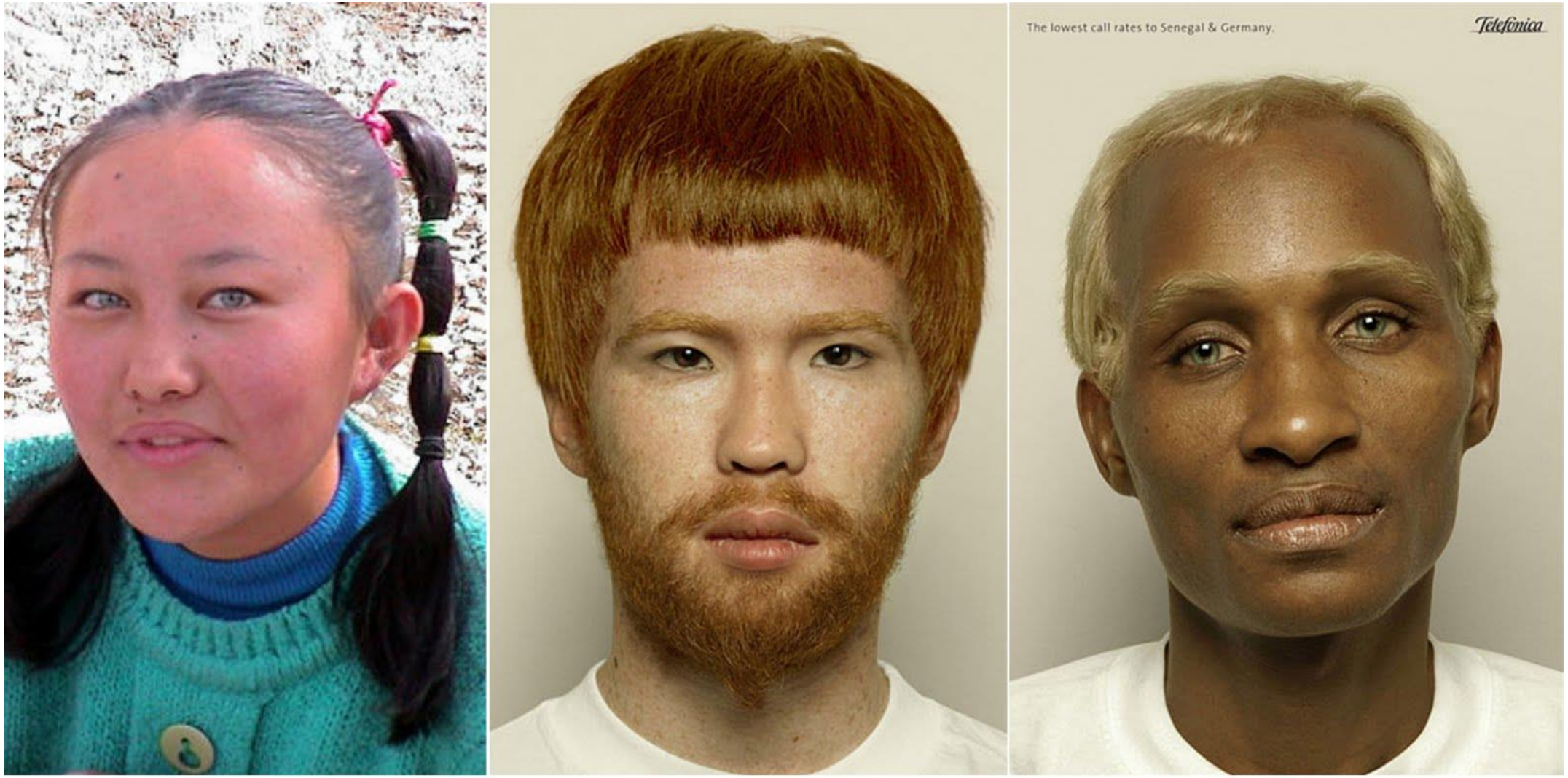
INTRODUCCIÓN

FENOTIPO



Wojczynski MK, Tiwari HK. Definition of phenotype. In: Rao DC, Gu CC, editors. Genetic dissection of complex traits. 2nd edition. USA: Elsevier; 2008. p. 75-105.

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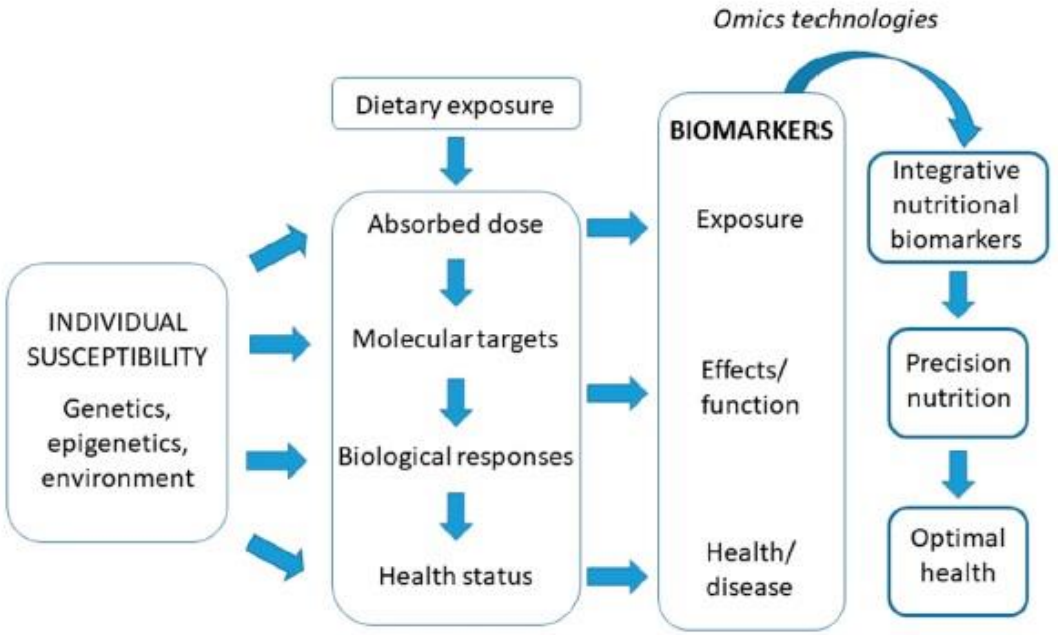
INTRODUCCIÓN

NUTRICION DE PRECISIÓN

BIOMARCADORES

BIOMARCADORES

- CUESTIONARIOS CRIBADO ENFERMEDAD
- INGESTA ALIMENTARIA
- GASTO ENERGÉTICO
- COMPOSICION CORPORAL
- PERFIL HORMONAL
- INTERACCION GEN-DIETA
- MICROBIOMA INTESTINAL



Picó C, Serra F, Rodríguez AM, Keijer J, Palou A. Biomarkers of Nutrition and Health: New Tools for New Approaches. Nutrients. 2019;11(5):1092.

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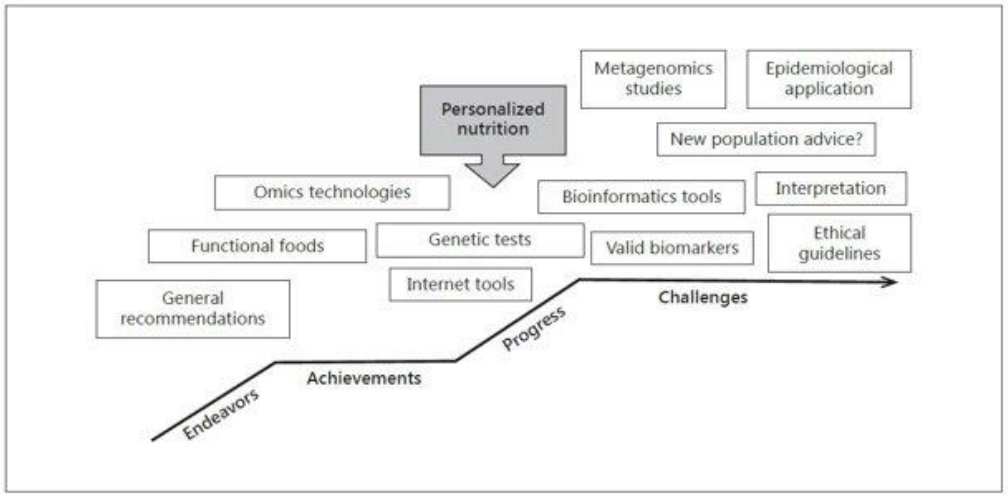
INTRODUCCIÓN

NUTRICION DE PRECISIÓN

DEFINICION



Ferguson LR, De Caterina R, Görman U, Allayee H, Kohlmeier M, Prasad C, et al. Guide and Position of the International Society of Nutrigenetics/Nutrigenomics on Personalised Nutrition: Part 1 - Fields of Precision Nutrition. J Nutrigenet Nutrigenomics. 2016;9(1):12-27.

MÉTRICAS:

- INGESTA ALIMENTARIA → e.g.hidroxitirosol
- GASTO ENERGÉTICO → e.g. REE (IC)
- COMPOSICION CORPORAL → e.g. FMI (BIA) → **FENOTIPO**
- PERFIL HORMONAL → e.g. BioT (e.g. Vermeulen A)
- INTERACCION GEN-DIETA → e.g. rs1042714 (Gln27Glu) y obe
- MICROBIOMA INTESTINAL → e.g. Abundancia relativa (ARN 16s ribosomal)

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INTRODUCCIÓN

DELGADEZ CONSTITUCIONAL (CT): FENOTIPO

Bulik CM, Allison DB. Constitutional thinness and resistance to obesity. En: Fairburn CG, Brownell KD, editores. Eating disorders and obesity : A comprehensive handbook. 2ª ed. New York: Guilford Press; 2005.

Obesidad

Resistencia perder peso

-Polo opuesto obesidad.

CT

Resistencia ganar peso

CT

-Discriminar fenotipo delgadez.

Malnutrición

Enfermedad

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INTRODUCCIÓN

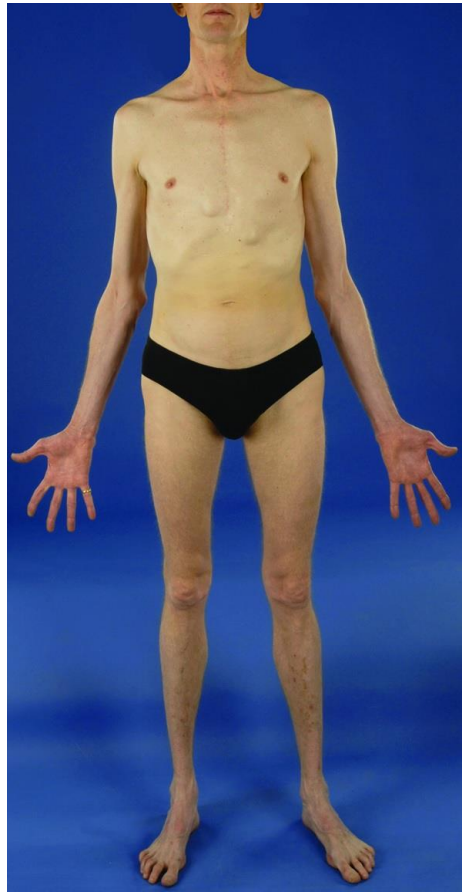
FENOTIPOS DELGADEZ

AN

CT

HIPERTIROIDISMO

SINDROME MARFAN



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Item REVISIÓN	NARRATIVA	SISTEMÁTICA
Popularidad biomedicina	Mayor	Menor
Reputación	Menor	Mayor
Sistematización	Menor	Mayor
Cobertura estudios	Menor	Mayor
Diseño metodológico	Inferior	Superior
Calidad global revisión	Variable	Variable
Jerarquía EBM	Inferior	Superior
Gold standard	No	Si

INTRODUCCIÓN

REVISIONES

Figure Number of PubMed-Indexed Articles Published Each Year Between 1986 and 2014 That Carry the Tag "Systematic Review" or "Meta-analysis" for Type of Publication

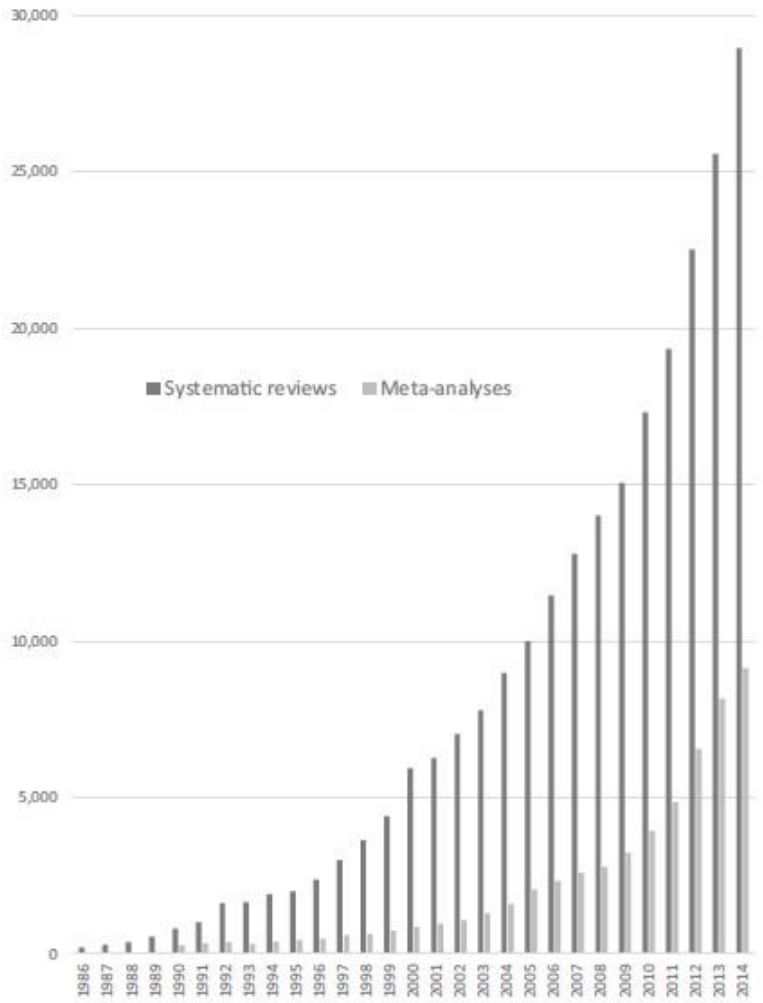
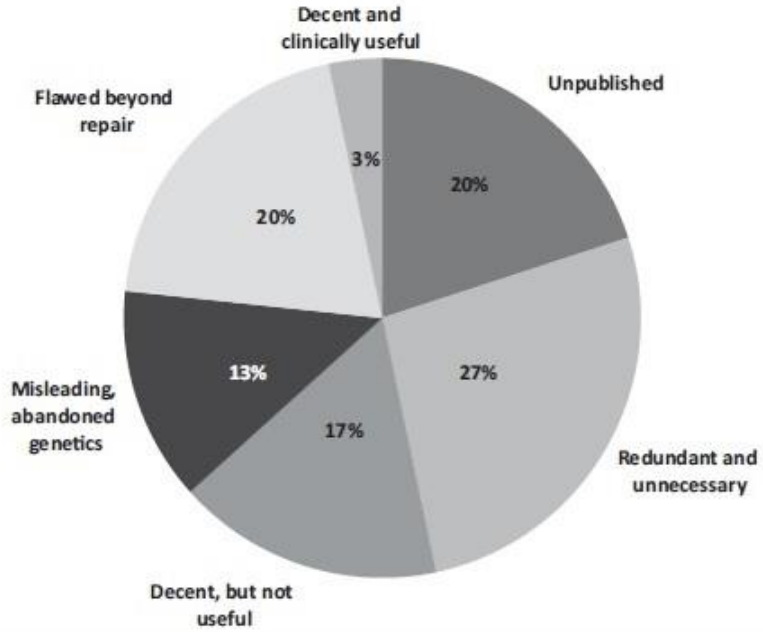


Figure 4. A Summary Overview of Currently Produced Meta-analyses



Ioannidis JP. The Mass Production of Redundant, Misleading, and Conflicted Systematic Reviews and Meta-analyses. Milbank Q. 2016;94(3):485-514.

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INTRODUCCIÓN

REVISIÓN NARRATIVA

SANRA (Scale for the Assessment of Narrative Reviews Articles).

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INTRODUCCIÓN

REVISIÓN NARRATIVA: ESCALA SANRA

Scale for the Assessment of Narrative Review Articles – SANRA

Please rate the quality of the narrative review article in question, using categories 0–2 on the following scale. For each aspect of quality, please choose the option which best fits your evaluation, using categories 0 and 2 freely to imply general low and high quality. These are not intended to imply the worst or best imaginable quality.

1) Justification of the article's importance for the readership

- The importance is not justified. — 0
- The importance is alluded to, but not explicitly justified. — 1
- The importance is explicitly justified. — 2

2) Statement of concrete aims or formulation of questions

- No aims or questions are formulated. — 0
- Aims are formulated generally but not concretely or in terms of clear questions. — 1
- One or more concrete aims or questions are formulated. — 2

3) Description of the literature search

- The search strategy is not presented. — 0
- The literature search is described briefly. — 1
- The literature search is described in detail, including search terms and inclusion criteria. — 2

4) Referencing

- Key statements are not supported by references. — 0
- The referencing of key statements is inconsistent. — 1
- Key statements are supported by references. — 2

5) Scientific reasoning

(e.g., incorporation of appropriate evidence, such as RCTs in clinical medicine)

- The article's point is not based on appropriate arguments. — 0
- Appropriate evidence is introduced selectively. — 1
- Appropriate evidence is generally present. — 2

6) Appropriate presentation of data

(e.g., absolute vs relative risk; effect sizes without confidence intervals)

- Data are presented inadequately. — 0
- Data are often not presented in the most appropriate way. — 1
- Relevant outcome data are generally presented appropriately. — 2

Sumscore

Baethge C, Goldbeck-Wood S, Mertens S. SANRA-a scale for the quality assessment of narrative review articles. Res Integr Peer Rev. 2019;4:5.

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MATERIAL Y MÉTODOS

Revisión narrativa (metodología SANRA).

Bases datos:

- Pubmed
- PMC
- Google Scholar

Criterios inclusión:

- 2000-Marzo 2020
- Seres humanos
- Inglés y español
- Keywords título

Arquitectura búsqueda:

"constitutional thinness" [title] OR "constitutionally thinness" [title] OR "constitutional thin" [title] OR "constitutionally thin" [title] OR thinness [title] OR "constitutionally lean" [title] OR "constitutional leanness" [title]

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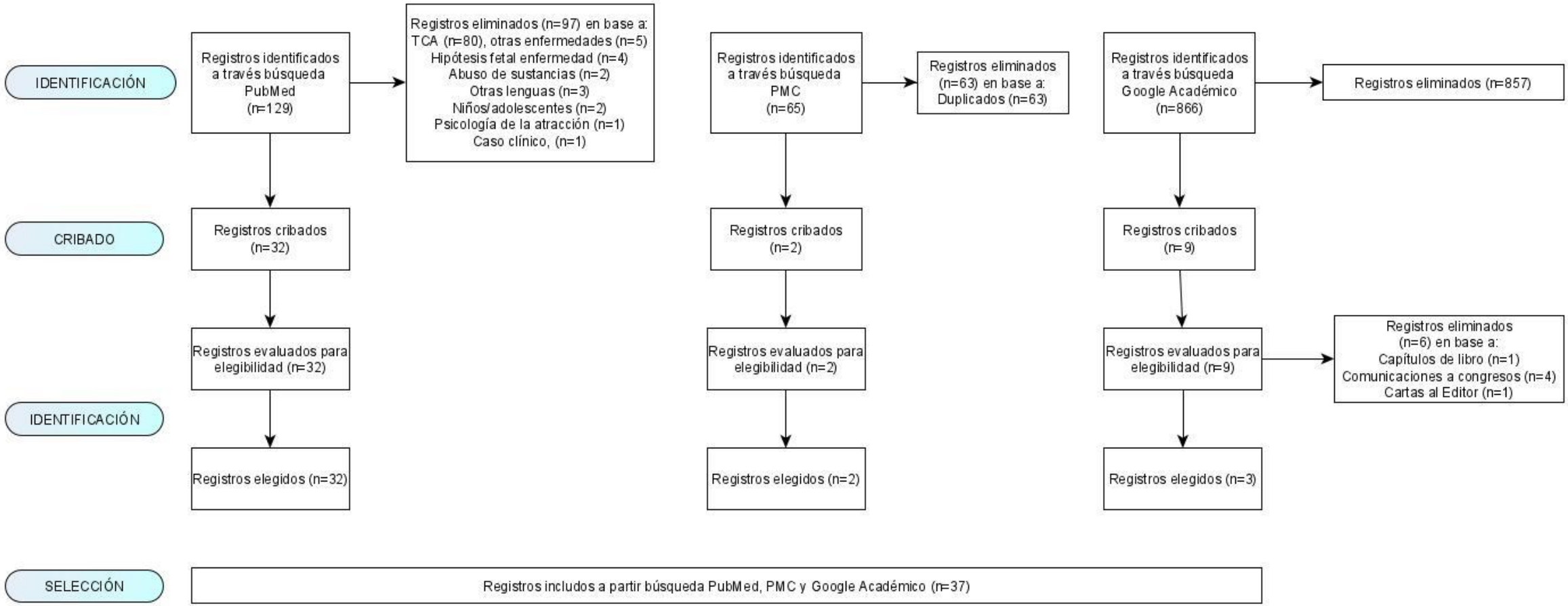
RESULTADOS

DIAGRAMA DE FLUJO



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RESULTADOS

DELGADEZ CONSTITUCIONAL (CT)

-Poco estudiada (Pubmed, n=1 revisión, noviembre 2020).

-No objeto de consulta médica.

-No comorbilidades asociadas.

-Delgadez saludable versus patológica.

Estour B, Galusca B, Germain N. Constitutional thinness and anorexia nervosa: a possible misdiagnosis? Front Endocrinol (Lausanne). 2014;5:175.

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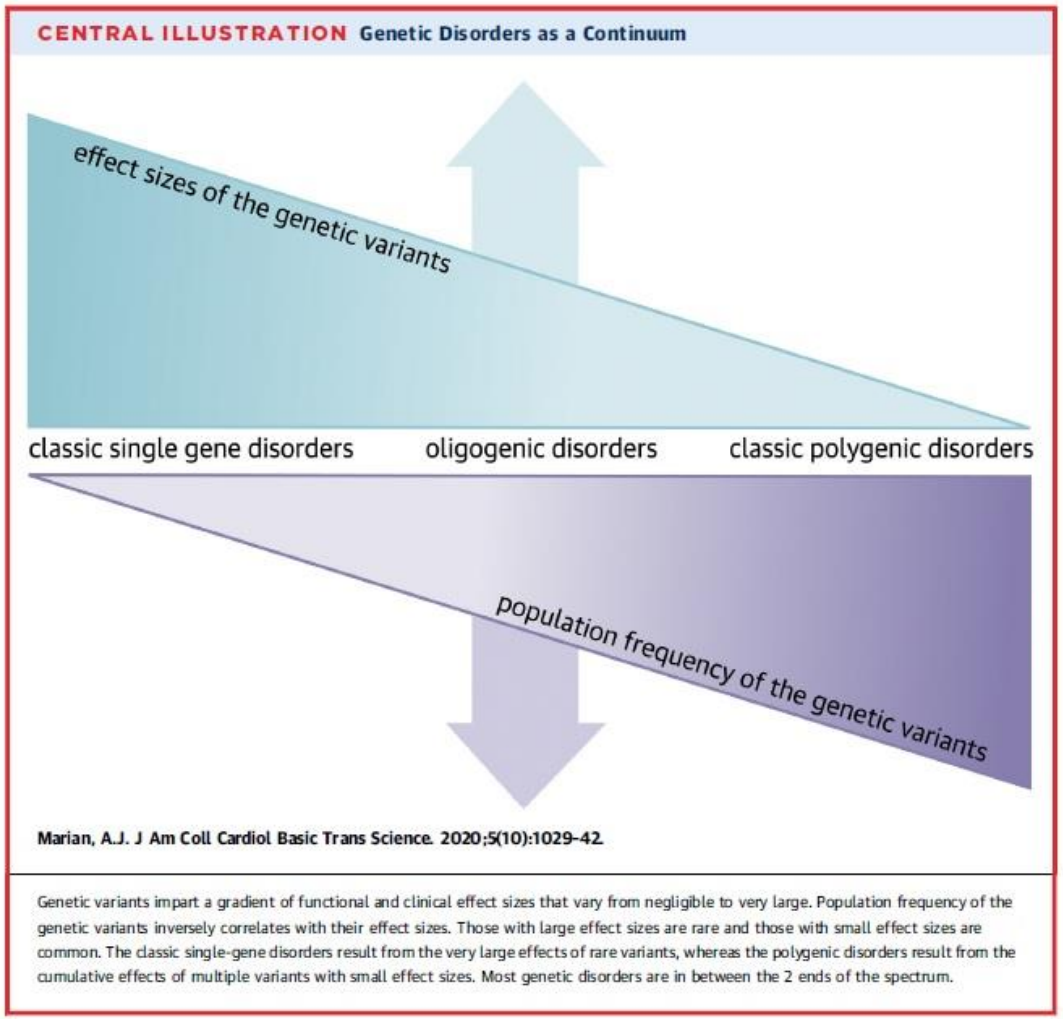
RESULTADOS

CT: GENÉTICA



Marian AJ. Clinical Interpretation and Management of Genetic Variants. JACC Basic Transl Sci. 2020;5(10):1029-1042.

-Muy pocos estudios.

-Mayoría en delgadez patológica.

-Herencia poligénica.

-Variantes: Causales de interacción

-¿Magnitud efecto variantes?

-¿Variante causal cosegrega con de interacción?

-Necesidad estudios interacciones gen-gen.

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RESULTADOS

CT: INTERACCIÓN GEN-GEN

-Estudio pedigrees.

-N (descubrimiento)=504

-N (validación)=3569

Obesidad

CT

OR de CT=2,5 interacción:Heterocigotos (T/C) APOH rs52797880 x homocigotos (T/T) FTO rs9939609

APOH (apolipoproteina H -β-2-glicoproteina I-)

FTO (Fat mass and obesity-associated protein or alpha-ketoglutarate-dependent dioxygenase)

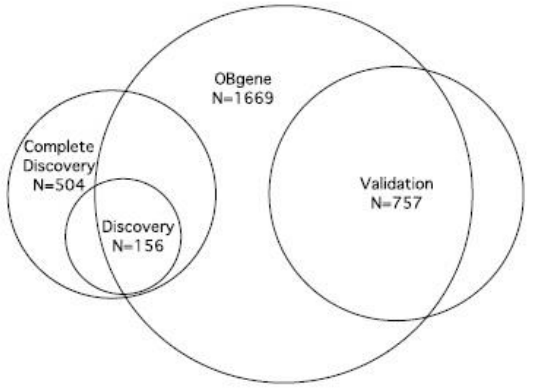

Fig. Samples used in the tests for association with thinness. Except for the complete discovery sample, all samples were restricted to BMI <85th percentile and 20 ≤ age < 80 years. The overlap sample (Table 1) comprised the overlap of the OBgene sample with the validation sample with the inclusion of an additional 28 subjects from the validation sample who were genotyped using the exome chip

Table Obesity-associated SNPs included in the analysis

SNP	Gene	Chromosome	Position (bp)[a]	*N*	MAF
rs12510838	*NPFFR2*	4	72961538	3661	0.1776
rs4129733	*NPFFR2*	4	72963020	3661	0.3063
rs9291171	*NPFFR2*	4	72981626	3661	0.2882
rs11940196	*NPFFR2*	4	73003569	3661	0.3614
rs12649641	*NPY2R*	4	156125333	3875	0.3880
rs12507396	*NPY2R*	4	156129044	3661	0.1114
rs17376826	*NPY2R*	4	156130948	3910	0.0359
rs10461238	*NPY2R*	4	156132216	3661	0.4447
rs10461239	*NPY2R*	4	156132447	3661	0.0460
rs2880415	*NPY2R*	4	156136027	3661	0.4527
rs9939609	*FTO*	16	53820527	4110	0.4356
rs17782313	*MC4R*	18	57851097	4131	0.2602
rs477181	*MC4R*	18	57896038	3898	0.3570

[a] Build GRCh37

Table Candidate variants with *P* values from 3 statistical tests performed on the complete discovery sample

Variant	Gene	Chr	Position (bp)[a]	*N*	MAF[b]	TDT	ASSOC	famSKAT
rs79762465	FSIP2	2	186654867	502	0.041	1.5×10^{-8}	1.2×10^{-5}	2.0×10^{-5}
rs981782	HCN1	5	45285718	403	0.462	NA	0.21	2.7×10^{-10}
rs61762674	SNTB1	8	121561028	503	0.002	1.5×10^{-3}	0.04	0.01
rs55761427	A2 M	12	9243017	501	0.011	3.1×10^{-3}	0.13	0.01
rs142230440	SPATS2	12	49884473	456	0.004	1.2×10^{-4}	1.8×10^{-5}	1.3×10^{-4}
rs1288775	GATM	15	45661678	501	0.264	NA	0.02	1.8×10^{-7}
rs41280102	SCN4A	17	62028920	456	0.009	1.3×10^{-3}	0.42	0.01
rs52797880	APOH	17	64216854	503	0.054	NA	4.7×10^{-5}	4.0×10^{-6}

[a] Build GRCh37

[b] Estimated using $N > 3000$ with genotypes

Table Percentage of the overlap sample that was thin, by APOH and FTO genotypes

FTO	APOH					
	T/T		*T/C*		*C/C*	
	N	Thin (%)	*N*	Thin (%)	*N*	Thin (%)
T/T	232	30	31	71	0	
T/A	330	25	51	29	2	100
A/A	98	28	19	21	0	

Hasstedt SJ, Coon H, Xin Y, Adams TD, Hunt SC. APOH interacts with FTO to predispose to healthy thinness. Hum Genet. 2016;135(2):201-7.

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RESULTADOS

Bossu C, Galusca B, Normand S, Germain N, Collet P, Frere D et al. Energy expenditure adjusted for body composition differentiates constitutional thinness from both normal subjects and anorexia nervosa. Am J Physiol Endocrinol Metab. 2007;292(1):E132-7.

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CT: BALANCE ENERGÉTICO

N=21 **Mujeres** → **CT (n=7)** **AN(n=7)** **Control(n=7)**

Balance energético (Kcal) → **TEI (Kcal) (Registro dietético)**

REE (Kcal)(IC)

TEE (Kcal) (DLW)

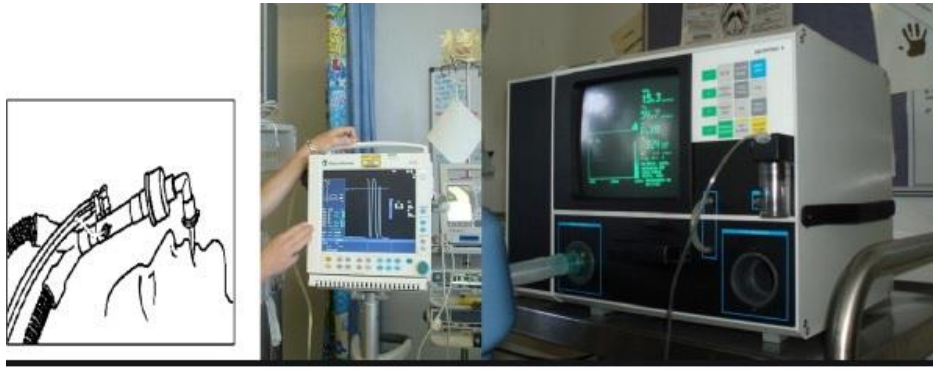
Composición corporal → **DEXA**

Hormonas → **Leptina** **IGF-1** **FT3**

Perfil psicológico

RESULTADOS

CT: GASTO ENERGÉTICO REPOSO



Deltatrac (Datex Instrumentarium, Helsinki, Finland)

Bossu C, Galusca B, Normand S, Germain N, Collet P, Frere D, et al. Energy expenditure adjusted for body composition differentiates constitutional thinness from both normal subjects and anorexia nervosa. Am J Physiol Endocrinol Metab. 2007;292(1):E132-7.

Table *Energy balance of constitutional thinness, anorexia nervosa, and control subjects of the study*

	CT (n = 7)	C (n = 7)	AN (n = 6)	P Value
Self-reported food intake, kJ/day	7,565±908	7,961±1,452	4,894±703	a, c
Protein intake, %	13.01±2.2	14.5±19	18.8±5.4	a, c
Carbohydrate intake, %	50.7±7.5	46.4±5.1	50.6±6.6	NS
Lipids intake, %	36.2±6.7	39.0±5.6	30.5±8.1	a
TEE, kJ/day	8,382±988	8,793±845	8,001±2152	NS
RMR, kJ/day	4,839±473	5,576±209	3,810±937	a, b, c
RQ	0.82±0.01	0.83±0.01	0.89±0.02	a, c
FQ	0.85±0.01	0.84±0.01	0.86±0.01	NS
AEE, kJ/day	3,542±464	3,207±410	4,191±967	NS
PAL	1.75±0.12	1.57±0.07	2.14±0.30	NS
TEE/FFM ratio	259.5±40.6	208.0±29.5	234.4±69.5	b
RMR/FFM ratio	148.6±5.4	131.8±10.4	111.3±25.0	b, c
RMR/FFM ratio (Kcal)	35,4	31,3	26,4	

Values are means ± SD. CT, constitutional thinness; AN, anorexia nervosa; C, control; TEE, total energy expenditure; RMR, resting metabolic rate; RQ, respiratory quotient; FQ, food quotient; AEE (TEE − RMR), activity energy expenditure; PAL (TEE/RMR), physical activity level. [a]$P < 0.05$ between C and AN; [b]$P < 0.05$ between C and CT; [c]$P < 0.05$ between AN and CT; NS, nonsignificant.

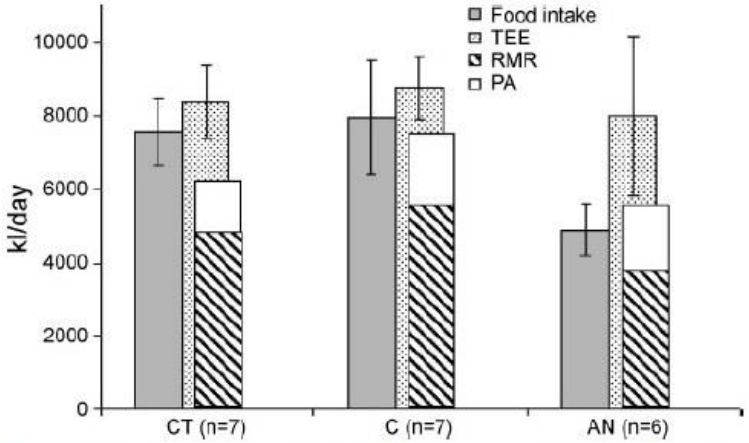


Fig. Energy metabolism in CT, young women controls (C), and anorexia nervosa (AN). Shown are mean values of self-reported food intake energy, total energy expenditure (TEE), resting metabolic rate (RMR), and physical activity (PA).

Table *Body composition and plasmatic nutritional markers of constitutional thinness, anorexia nervosa, and control subjects*

	CT (n = 7)	C (n = 7)	AN (n = 6)	P Value
Weight, kg	42.7±3.0	54.1±4.5	40.8±4.0	a, b
BMI, kg/m^2	16.1±0.6	21.2±0.8	15.8±0.8	a, b
FFM, %	81.7±2.1	73.8±4.1	90.6±5.4	a, b, c
FM, %	18.3±2.1	26.9±4.1	9.4±5.4	a, b, c
FFM, kg	32.5±2.9	37.8±1.6	34.1±1.9	a, b
FM, kg	7.7±1.2	14.9±2.1	3.8±2.4	a, b
Leptin, ng/ml	8.3±3.4	9.0±3.1	2.8±2.2	a, c
Free T3, pmol/l	3.7±0.5	3.8±0.5	2.4±0.4	a, c
IGF-1, ng/ml	225±93	274±60	168±62	a

Values are means ± SD. BMI, body mass index; FFM, fat-free mass; FM, fat mass. [a]$P < 0.05$ between C and AN; [b]$P < 0.05$ between C and CT; [c]$P < 0.05$ between AN and CT.

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RESULTADOS

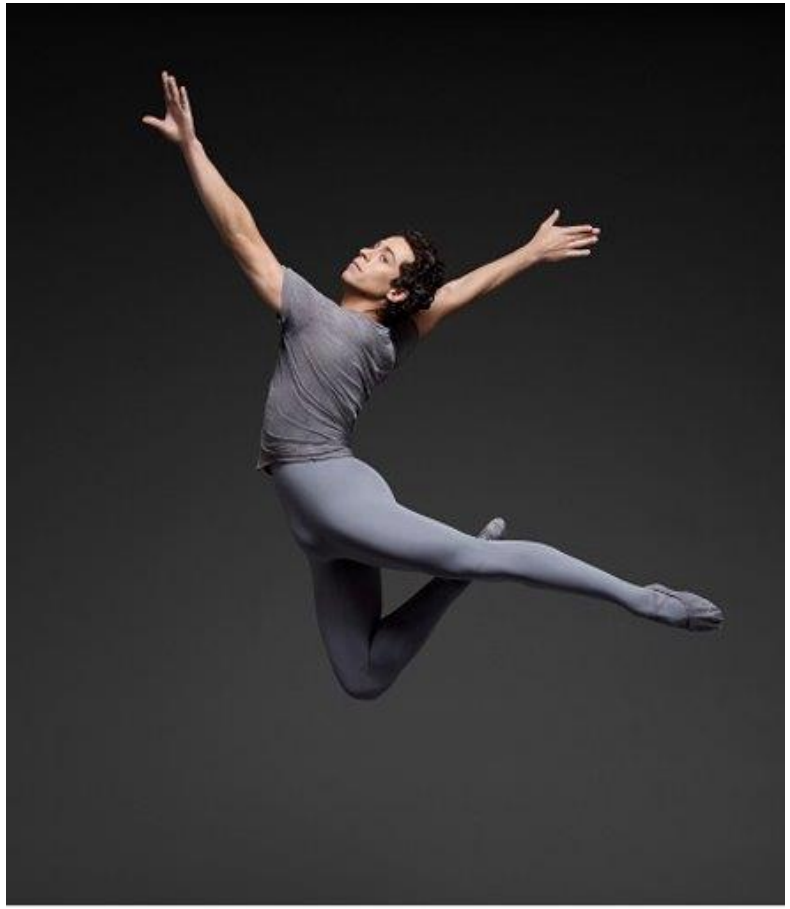
N=62 **Hombres** → **CT (n=15)** **AN (n=17)** **BD (n=12)** **Control(n=18)**

Balance energético (Kcal) → **TEI (Kcal) (Registro dietético)**

REE (Kcal)(IC)

Composición corporal → **BIA**

CT: BALANCE ENERGÉTICO



Marra M, Sammarco R, De Filippo E, De Caprio C, Speranza E, Contaldo F, et al. Resting Energy Expenditure, Body Composition and Phase Angle in Anorectic, Ballet Dancers and Constitutionally Lean Males. Nutrients. 2019;11(3):502

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RESULTADOS

CT: GASTO ENERGÉTICO REPOSO

BIA Human Im Plus II (DS Medica-Milan)

Marra M, Sammarco R, De Filippo E, De Caprio C, Speranza E, Contaldo F, et al. Resting Energy Expenditure, Body Composition and Phase Angle in Anorectic, Ballet Dancers and Constitutionally Lean Males. Nutrients. 2019;11(3):502.

Table Anthropometric measurements of 62 males individuals, according to leanness groups.

	AN (n = 17)	CL (n = 15)	DANCERS (n = 12)	CTR (n = 18)
Age (years)	22.3 ± 5.3	23.3 ± 5.2	19.7 ± 1.6	22.3 ± 3.7
Weight (kg)	51.8 ± 4.8 [a]	56.1 ± 3.3 [a]	62.3 ± 5.3 [b]	70.3 ± 6.5
Height (cm)	174 ± 5.1	177 ± 4.5	176 ± 5.0	177 ± 4.4
BMI (kg/m^2)	17.1 ± 1.2 [a]	17.9 ± 0.6 [a]	20.0 ± 1.3 [b]	22.3 ± 1.7
FFM (kg)	46.0 ± 5.2 [a]	48.6 ± 4.4 [a]	58.9 ± 4.8	56.2 ± 6.1
FM (kg)	5.3 ± 2.8 [b]	7.6 ± 3.1 [d]	3.4 ± 1.3 [b]	14.0 ± 30
FM (%)	10.3 ± 5.7 [a]	13.6 ± 5.7 [a]	5.5 ± 1.8 [c]	20.0 ± 3.6
PhA (degrees)	5.8 ± 1.2 [c]	6.9 ± 0.6 [d]	7.9 ± 0.7 [b]	6.8 ± 0.4

[a] $p < 0.05$ vs. Dancers and CTR; [b] $p < 0.05$ vs. CTR; [c] $p < 0.05$ vs. AN and Dancers and CTR; [d] $p < 0.05$ vs. Dancers, FFM: fat Free Mass, FM: Fat Mass, PhA: phase angle.

Table Resting energy expenditure of 62 males individuals, according to leanness groups.

	AN (n = 17)	CL (n = 15)	DANCERS (n = 12)	CTR (n = 18)
REE (kcal/day)	1150 ± 169 [a]	1726 ± 216 [b]	1563 ± 179 [c]	1678 ± 167
REE adjusted for FFM (kcal/day)	1185 ± 57 [a]	1757 ± 48 [b]	1498 ± 60 [a]	1637 ± 46 [b]
REE/FFM (kcal/kg)	25.2 ± 4.2 [d]	35.9 ± 6.2 [a]	26.6 ± 2.4 [e]	30.0 ± 3.0 [f]
RQ	0.84 ± 0.06	0.85 ± 0.05	0.86 ± 0.07	0.85 ± 0.04

[a] $p < 0.05$ vs. all groups; [b] $p < 0.05$ vs. AN and Dancers; [c] $p < 0.05$ vs. AN; [d] $p < 0.05$ vs. CL and CTR; [e] $p < 0.05$ vs. CL; [f] $p < 0.05$ vs. AN and CL. REE: resting energy expenditure, RQ: respiratory quotient.

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RESULTADOS

CT: ESTIMACIÓN REE (Kcal)

-Ausencia ecuaciones de predicción del REE en sujetos con CT.

Müller MJ et al, 2004.

HOMBRES → REE (MJ/d)= 0.07122xPeso (Kg)- 0.02149xEdad (años)+0.82+0,731

BMI≤18

MUJERES → REE (MJ/d)= 0.07122xPeso (Kg)- 0.02149xEdad (años)+0,731

Müller MJ, Bosy Westphal A, Klaus S, Kreymann G, Lührmann PM, Neuhäuser-Berthold M, et al. World Health Organization equations have shortcomings for predicting resting energy expenditure in persons from a modern, affluent population: generation of a new reference standard from a retrospective analysis of a German database of resting energy expenditure. Am J Clin Nutr. 2004;80(5):1379-90

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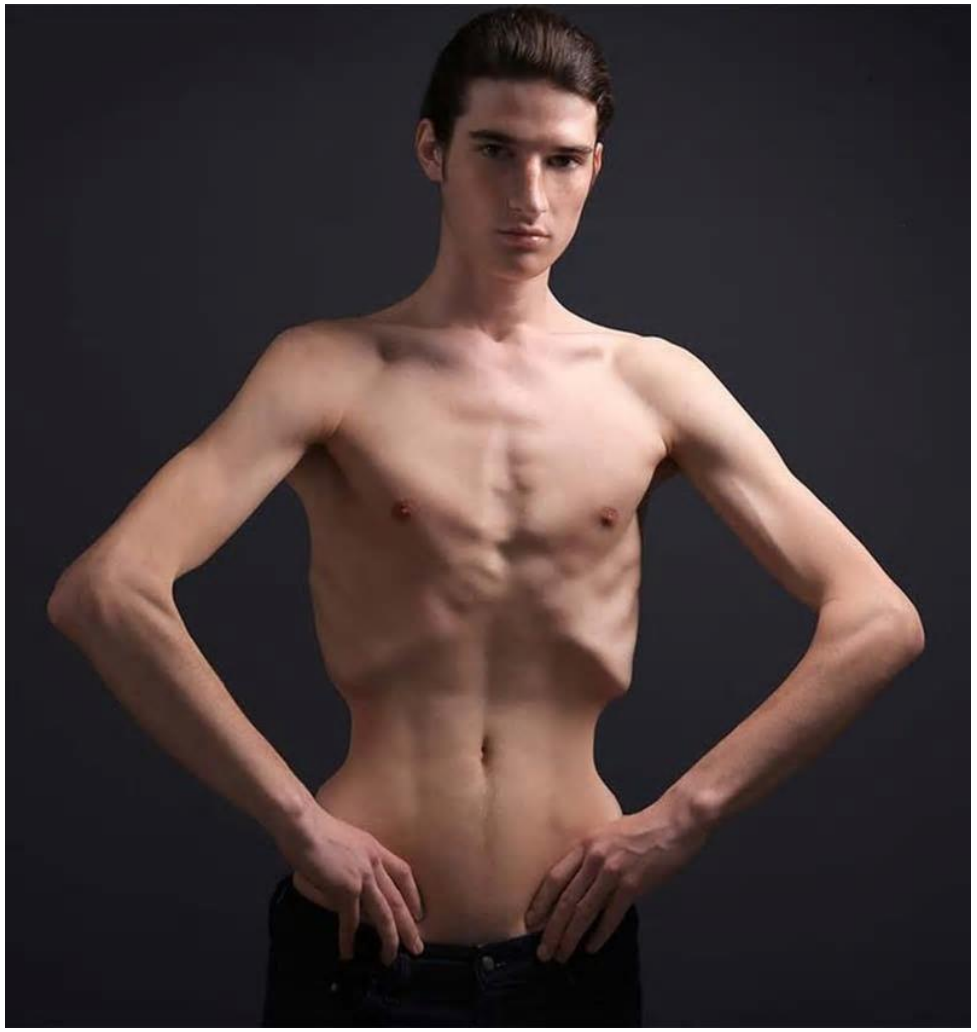
RESULTADOS

CT: ESTIMACIÓN REE (Kcal)



Müller MJ et al, 2004.

-Limitaciones: hombres y mujeres BMI≤18,5

CT (n=97) y AN (n=49)

No discriminaron CT de AN para BMI≤18,5

TABLE
Characteristics of BMI subgroups of adult subpopulations 1 and 2[1]

	BMI in subpopulation 1 (kg/m^2)				BMI in subpopulation 2 (kg/m^2)			
	≤18 (n = 5 M, 53 F)	>18 to 25 (n = 183 M, 261 F)	>25 to <30 (n = 101 M, 165 F)	≥30 (n = 99 M, 179 F)	≤18 (n = 4 M, 45 F)	>18 to 25 (n = 192 M, 290 F)	>25 to <30 (n = 119 M, 148 F)	≥30 (n = 95 M, 166 F)
Age (y)	32.0 ± 12.2	38.0 ± 17.1	53.5 ± 16.0	47.8 ± 13.8	30.4 ± 12.6	38.6 ± 17.0	53.5 ± 16.5	47.3 ± 14.2
Height (m)	169.0 ± 7.4	172.0 ± 10.0	168.3 ± 10.6	168.1 ± 9.4	169.0 ± 7.7	170.9 ± 9.5	169.6 ± 10.7	167.9 ± 9.4
Weight (kg)	46.7 ± 6.0	65.5 ± 9.4	77.4 ± 10.4	105.2 ± 23.2	46.3 ± 5.8	65.0 ± 9.2	79.1 ± 10.6	103.4 ± 20.7
BMI (kg/m^2)	16.3 ± 1.6	22.1 ± 1.7	27.2 ± 1.5	37.1 ± 7.2	16.2 ± 1.7	22.2 ± 1.7	27.4 ± 1.3	36.6 ± 6.4
FFM (kg)	37.9 ± 4.3	49.2 ± 9.8	51.4 ± 11.9	62.3 ± 14.6	38.7 ± 5.0	48.4 ± 10.1	53.1 ± 12.3	62.3 ± 14.5
FM (%)	16.9 ± 7.4	25.4 ± 8.5	33.7 ± 8.6	38.8 ± 8.9	16.2 ± 7.7	25.9 ± 8.3	33.3 ± 8.6	38.8 ± 8.6
REE (MJ/d)	4.81 ± 0.99	6.24 ± 1.14	6.44 ± 1.24	7.82 ± 1.80	4.83 ± 0.92	6.27 ± 1.23	6.60 ± 1.25	7.73 ± 1.72

[1] All values are $\bar{x}$ ± SD. FFM, fat-free mass; FM, fat mass; REE, resting energy expenditure. There were no significant differences between the subgroups in any of the measured variables (Mann-Whitney *U* test).

Müller MJ, Bosy Westphal A, Klaus S, Kreymann G, Lührmann PM, Neuhäuser-Berthold M, et al. World Health Organization equations have shortcomings for predicting resting energy expenditure in persons from a modern, affluent population: generation of a new reference standard from a retrospective analysis of a German database of resting energy expenditure. Am J Clin Nutr. 2004;80(5):1379-90.

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RESULTADOS

CT: INGESTA CALÓRICA TOTAL (Kcal)

Schoeller DA. The energy balance equation: looking back and looking forward are two very different views. Nutr Rev. 2009;67(5):249-54.

Resistencia ganar peso

Resistencia perder peso

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RESULTADOS

CT: INGESTA CALÓRICA TOTAL (Kcal)

-¿1 Kcal es 1 Kcal?

En principio si.

Pérdida peso independiente % macronutrientes

% macronutrientes y ganancia peso.

% macronutrientes pérdida peso=f (genotipo, enterotipo)

-¿1 Kcal es 1 Kcal?

En principio no.

% macronutrientes ganancia peso=f (genotipo, enterotipo)

Feinman RD, Fine EJ. "A calorie is a calorie" violates the second law of thermodynamics. Nutr J. 2004;3:9.

Howell S, Kones R. "Calories in, calories out" and macronutrient intake: the hope, hype, and science of calories. Am J Physiol Endocrinol Metab. 2017;313(5):E608-E612

San-Cristobal R, Navas-Carretero S, Martínez-González MÁ, Ordovas JM, Martínez JA. Contribution of macronutrients to obesity: implications for precision nutrition. Nat Rev Endocrinol. 2020;16(6):305-320.

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RESULTADOS

CT: RESISTENCIA A GANAR PESO

-Ingesta alimentaria.

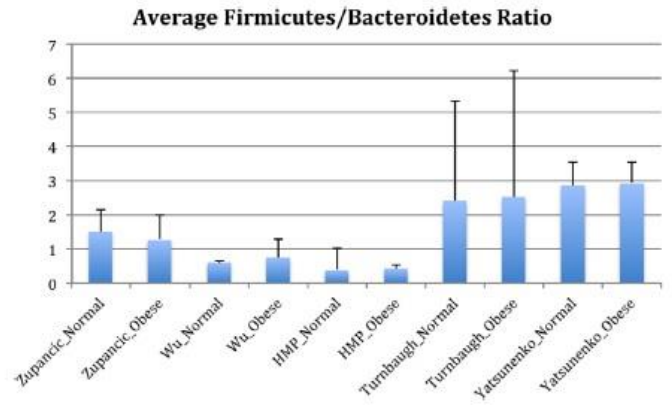
-Genética.

-Genotipo derrochador.

Hollstein T, et al. . Am J Clin Nutr. 2019;110(3):593-604.

-Microbioma intestinal.

-↑ ratio Firmicutes/Bacteroidetes



Walters WA, Xu Z, Knight R. Meta-analyses of human gut microbes associated with obesity and IBD. FEBS Lett. 2014;588(22):4223-33.

Castaner O, et al. Int J Endocrinol. 2018;2018:4095789

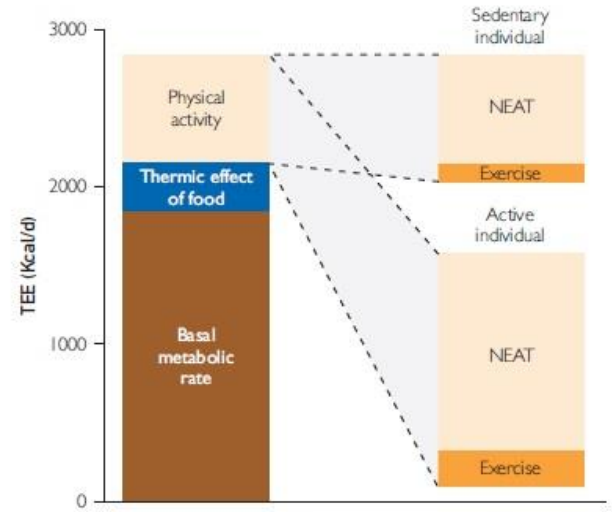
-Distribución, volumen y actividad BAT.

Leitner BP, et al. Proc Natl Acad Sci USA. 2017;114(32):8649-8654.

-Termogénesis adaptativa.

-NEAT

Vanltallie TB. Nutr Rev. 2001;59(2):48-51.



DR Jr, Wright RS, Levine JA. Nonexercise activity thermogenesis in obesity management. Mayo Clin Proc. 2015;90(4):509-19.

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RESULTADOS

CT: RESISTENCIA A GANAR PESO

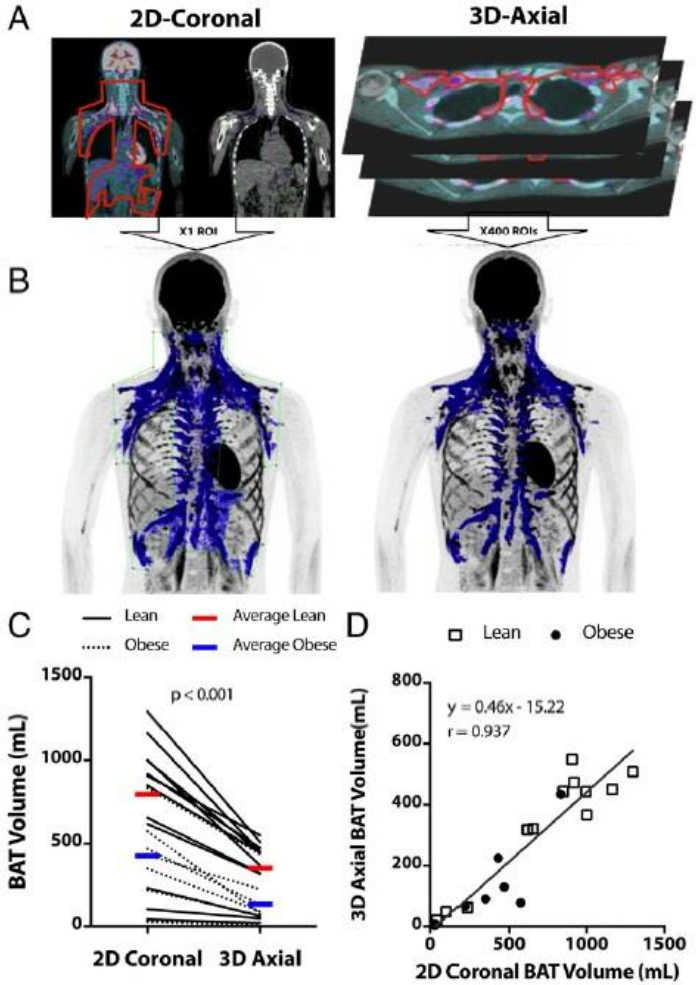

Fig. 2. Detected BAT volume quantified by axial and coronal ROI methods. (*A*) ROI selections for coronal and axial views (red lines). (*B*) Detected BAT shown in blue pixels. (*C*) Detected BAT volume for all subjects comparing coronal vs. axial methods. *P* value calculated by the Mann–Whitney *U* test. (*D*) Correlation between axial and coronal BAT volume quantifications.

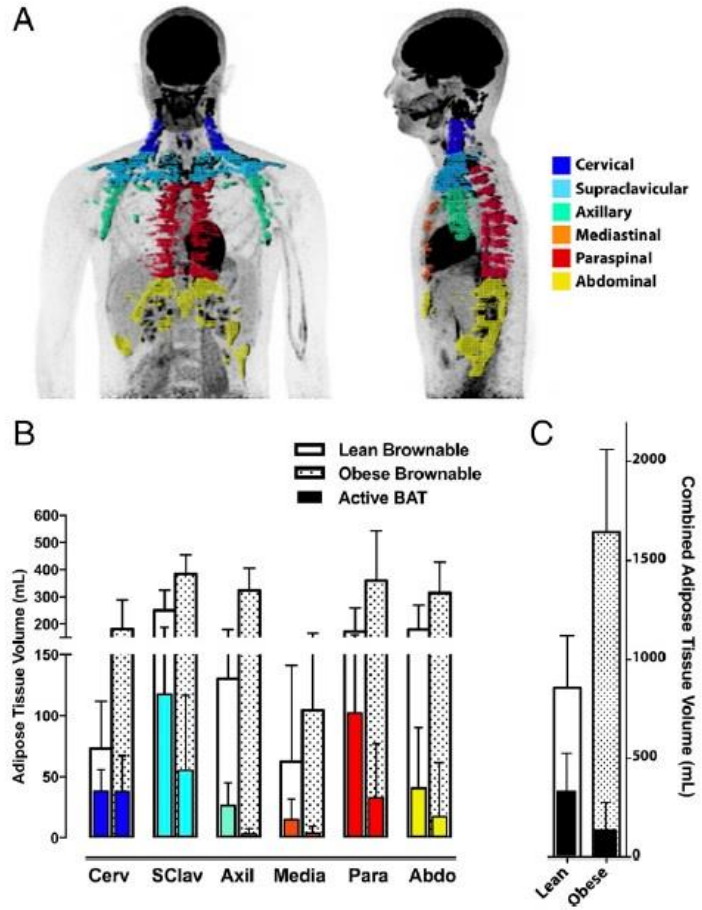

Fig. 4. Distribution and capacity of human BAT. (*A*) Regional distribution of BAT in six anatomic depots. (*B*) Average (SD) amount of activated and brownable inactive fat in the defined depots. (*C*) Summed active and brownable tissue in 12 lean subjects and 8 obese subjects. Empty and dotted bars in *B* and *C* represent volumes of the entire adipose tissue depots in which active BAT was found. The solid colored bars in *B* represent the volume of activated BAT within each adipose tissue depot, and the solid black bars in *C* represent the total activated BAT found in the body.

Leitner BP, Huang S, Brychta RJ, Duckworth CJ, Baskin AS, McGehee S, et al. Mapping of human brown adipose tissue in lean and obese young men. Proc Natl Acad Sci U S A. 2017;114(32):8649-54.

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RESULTADOS

DIETAS HIPERCALÓRICAS Y COMPOSICIÓN CORPORAL

-Menos estudios.

-Predominio sedentarios.

-Superavit calórico variable:

+20-70% TEE.

(+500-1800 Kcal)

Table Summary of overfeeding studies.

Author	n - Men / Women Age	Body Fat %	Physical Activity	Dur-ation	Kcal Sur-plus	Protein (g/kg)	BW (kg)	FM (kg)	FFM (kg)	Fat gain (% wt gain)
Salans et al. 1971	5 / 0 26	19%	"Reduced"	3 months			+ 16.2	+ 10.4	+ 5.8	64%
Norgan & Durnin 1980	6 / 0 22	15%	Sedentary	9 weeks	+ 50%	2.2	+ 6.0	+ 3.7	+ 2.3	62%
Webb & Annis 1983	4 / 5 46	15% (M) / 37% (W)	Sedentary	30 days	+ 1000 kcal	2.4	+ 1.8 a	+ 1.1 a	+ 0.7	61%
						1.7	+ 2.7 b	+ 2.0 b	+ 0.7	74%
						1.2	+ 2.7 b	+ 2.1 b	+ 0.6	78%
Ravussin et al. 1985	5 / 0 24	15%	6000-7000 steps/d	9 days	+ 60%	2.1	+ 3.2	+ 1.8	+ 1.4	56%
Poehlman et al. 1986	12 / 0 19	12%	Sedentary	22 days	+ 1000 kcal	2.4	+ 2.2	+ 1.1	+1.1	50%
Bouchard et al.1990	24 / 0 21	11%	< 30 min walk daily	100 days	+ 1000 kcal		+ 8.1	+ 5.4	+ 2.7	67%
Roberts et al. 1990	7 / 0 24	14%	Sedentary	20 days	+ 1000 kcal	1.5	+ 2.5	+ 1.7	+ 0.8	68%
Horton et al. 1995	16 / 0 33	28%	Inactive	2 weeks	+ 50%	1.2	+ 2.9	+ 1.5	+ 1.4	52%
						1.2	+ 2.6	+ 1.5	+ 1.1	58%
Lammert et al. 2000	20 / 0 22	15%	Inactive	3 weeks	+ 1200 kcal	1.7	+ 1.4	+ 0.8	+ 0.6	57%
						1.7	+ 1.6	+ 1.1	+ 0.5	69%
				3 weeks	+ 20%	1.4	+ 0.7	+ 0.4	+ 0.3	57%
Siervo et al. 2008	6 / 0 43	21%	Inactive	3 weeks	+ 40%	1.5	+ 2.9	+ 1.5	+ 1.4	52%
				3 weeks	+ 60%	1.7	+ 5.7	+ 3.6	+ 2.7	63%
Claesson et al. 2009	11 / 14 23	24%	7800 step avg	14 days	+ 46%	2.0	+ 0.3	+ 0.0	+ 0.3	0%
						1.2	+ 0.8	+ 0.3	+ 0.5	38%
Stanhope et al. 2009	16 / 16 54	29% (M) / 41% (W)	Sedentary	8 weeks	+ 8%		+ 1.6	+ 0.9	+ 0.7	56%
							+ 1.3	+ 0.7	+ 0.6	54%
Ernersson et al. 2010	12 / 6 26	15% (M) / 31% (W)	< 5000 steps/d	4 weeks	+ 70%	2.4	+ 6.4	+ 3.7	+ 1.8	58%
							+ 3.4	+ 2.4	+ 1.0	71%

Leaf A, Antonio J. The Effects of Overfeeding on Body Composition: The Role of Macronutrient Composition – A Narrative Review. Int J Exerc Sci. 2017;10(8):1275-96.

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RESULTADOS

DIETAS HIPERCALÓRICAS Y COMPOSICIÓN CORPORAL

Table Summary of overfeeding studies.

Author	n - Men / Women Age	Body Fat %	Physical Activity	Dur-ation	Kcal Sur-plus	Protein (g/kg)	BW (kg)	FM (kg)	FFM (kg)	Fat gain (% wt gain)
Samocha-Bonet et al. 2010	21 / 20 37	33%	Inactive	4 weeks	+ 60%	1.5	+ 2.2 a	+ 1.7	+ 0.5	77%
Tchoukalova et al. 2010	15 / 13 29	16% (M) / 30% (W)	Inactive	8 weeks			+ 4.6	+ 3.8	+ 0.8	83%
Bray et al. 2012	5 / 3	24%	Inactive	8 weeks	+ 40%	0.7	+ 3.1 a	+ 3.7	- 0.7 a	119%
	6 / 3	24%				1.8	+ 6.0 b	+ 3.5	+ 2.9 b	58%
	5 / 3 24	26%				3.0	+ 6.5 b	+ 3.4	+ 3.2 b	52%
Cornford et al. 2013	7 / 2 24	26%	< 1500 steps/d	2 weeks	+ 70%	1.9	+ 2.1	+ 1.4	+ 0.7	67%
Antonio et al. 2014	11 / 9 24	17%	Resistance Training	8 weeks	+ 800 kcal	4.4	+ 1.7	- 0.2	+ 1.9	0%
Johannsen et al. 2014	29 / 0 27	19%	Inactive	8 weeks	+ 40%	1.8	+ 7.6	+ 4.2	+ 3.4	55%
Reitman et al. 2014	27 / 0 23	15%	Inactive	4 weeks	+ 480 kcal	3.3	+ 0.3	- 0.3	+ 0.6	0%
Rosqvist et al. 2014	13 / 5	18%	Sedentary	7 weeks	+ 750 kcal	1.4	+ 1.6	+ 0.8 a	+ 0.8 a	50%
	13 / 6 27	14%				1.4	+ 1.6	+ 1.3 b	+ 0.3 b	81%
Antonio et al. 2015	24 / 7 23	18%	Resistance Training	8 weeks	+ 380 kcal	3.4	- 0.1	- 1.6	+ 1.5	0%
Antonio et al. 2016	12 / 0 26	14%	Resistance Training	8 weeks	+ 370 kcal	3.3	- 0.5	- 1.1	+ 0.6	0%
Spillane et al. 2016	11 / 0	18%	Resistance Training	8 weeks	+ 1250 kcal	2.4	+ 3.8 a	+ 1.4	+ 2.3	37%
	10 / 0 20	22%				1.0	+ 1.4 b	+ 1.5	+ 0.2	107%
Campbell et al. 2016	0 / 17 21	23%	Resistance Training	8 weeks	+ 400 kcal	2.4	+1.2	-1.1	+2.1 a	0%

Bold indicates significant change from baseline. Different letters indicate significant between group differences when applicable. Grey shading indicates data not available. Legend: BF – body fat, bw – body weight, d – days, CHO – carbohydrate, FFM – fat free mass, FM – fat mass, kcal – kilocalorie, PRO – protein, PUFA – polyunsaturated fat, SFA – saturated fat, wk – week, yr – years.

Leaf A, Antonio J. The Effects of Overfeeding on Body Composition: The Role of Macronutrient Composition – A Narrative Review. Int J Exerc Sci. 2017;10(8):1275-96.

-Respuesta heterogénea.

P (kg)=-0,5 a +16,2

FM (kg)= -1,1 a +10,4

FFM (kg)= +0,6 a +5,8

-Sesgos metodológicos:

-Potencia estadística baja.

-Tiempo de intervención pequeño.

-Distintas metodologías estimación composición corporal.

-Falta control factores confusión.

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RESULTADOS

DIETAS HIPERCALÓRICAS Y COMPOSICIÓN CORPORAL

-Distintos protocolos sobrealimentación.

-Protocolo sobrealimentación en CT.

+600 Kcal en forma suplemento.

Ling Y, Galusca B, Hager J, Feasson L, Valsesia A, Epelbaum J, et al. Rational and design of an overfeeding protocol in constitutional thinness: Understanding the physiology, metabolism and genetic background of resistance to weight gain. Ann Endocrinol (Paris). 2016;77(5):563-69.

-Estudios de realimentación en AN-R.

-Superavit calórico escalonado.

-Inicio TEE+(60 Kcal/kg/dia)=300-500 Kcal/dia

Marzola E, Nasser JA, Hashim SA, Shih PA, Kaye WH. Nutritional rehabilitation in anorexia nervosa: review of the literature and implications for treatment. BMC Psychiatry. 2013;13:290.

-Macronutrientes

Carbohidrato: 6-8g/kg/día

Proteína: ≤1,2g/kg/día

Lípidos: 12-15g/kg/día

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RESULTADOS

CT: INGESTA CALÓRICA TOTAL (Kcal)

-Patrón Dieta Mediterráneo (MFP).

-Alimentos alta densidad nutricional

-Alimentos refinados

-Alimentos con alto GI y GL:
e.g. frutas desecada

-Tomas: 3/día

-Fibra: 20-25g/día

-¿Suplementos nutricionales?

Valorar según paciente.

TEE (Kcal) (PAL=1,5)	2589
Macronutrientes (g/ %)	Hombre (56 kg)
Carbohidratos (7g/kg/dia)	1568 (60)
Proteínas (g) (1,2g/kg/dia)	269 (10)
Lípidos (g)	84 (30)

TEE (Kcal) (PAL=1,5)	1726
Macronutrientes (g/ %)	Mujer (43 kg)
Carbohidratos (6g/kg/dia)	1032 (60)
Proteínas (g) (1,2g/kg/dia)	206 (12)
Lípidos (g)	54 (28)

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INTRODUCCIÓN

FENOTIPOS DELGADEZ

FENOTIPO	AN-restrictiva	CT	Hipertiroidismo	MS
Signos y síntomas	Trayectoria peso irregular. Baja peso intencional a expensas medidas extremas. Aspecto insano. Psicopatología. Amenorrea.	Histórico de bajo peso estable. Bajo peso a pesar de un deseo intenso por bajar de peso. Aspecto sano. No psicopatología. Menstruaciones presentes.	Exoftalmia, bajo peso, nerviosismo, insomnio, alopecia, mirada fija, náuseas, vómitos, piel caliente/húmeda, bocio, bradicardia, palpitacion debilidad muscular	Aracnodactilia, miopia, escoliosis,desprendimiento retina, prolapso válvula mitral, disección aórtica
B energético	Negativo	Equilibrado o positivo	Negativo	Ausencia estudios
Composición corporal	Bajo peso a expensas FFM y FM Mayor compromiso FFM que en CT	Bajo peso a expensas FFM y FM Menor compromiso FFM que en AN	Pocos estudios No estudios con CT	Ausencia estudios
REE	Términos absolutos (REE) y relativos (REE/FFM). AN<CT→AN: Hipometabolismo	Términos absolutos (REE) y relativos (REE/FFM). AN<CT→CT: Hipermetabolism	Pocos estudios No estudios con CT REE/kg (tirotoxicosis) >REE /kg (eutiroideos)	Ausencia estudios
Perfil hormonal	↓T3, ↓Leptina, ↓IGF-1,↑GH, ↑ACTH, ↑cortisol, ↓17βE2, ↓LH, ↓FSH	Normal	Overt: ↑T3, T4 y ↓ TSH Subclínical: ↑T3, T4 normal y ↓ TSH baja o normal	Ausencia estudios

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CONCLUSIONES

- Campo de estudio poco estudiado.
- Revisión narrativa.
- Otras bases de datos: CINAHL, EBSCO, etc.
- Sólo una persona revisó los artículos.
- Algunos estudios con sesgos metodológicos.

LIMITACIONES REVISIÓN NARRATIVA

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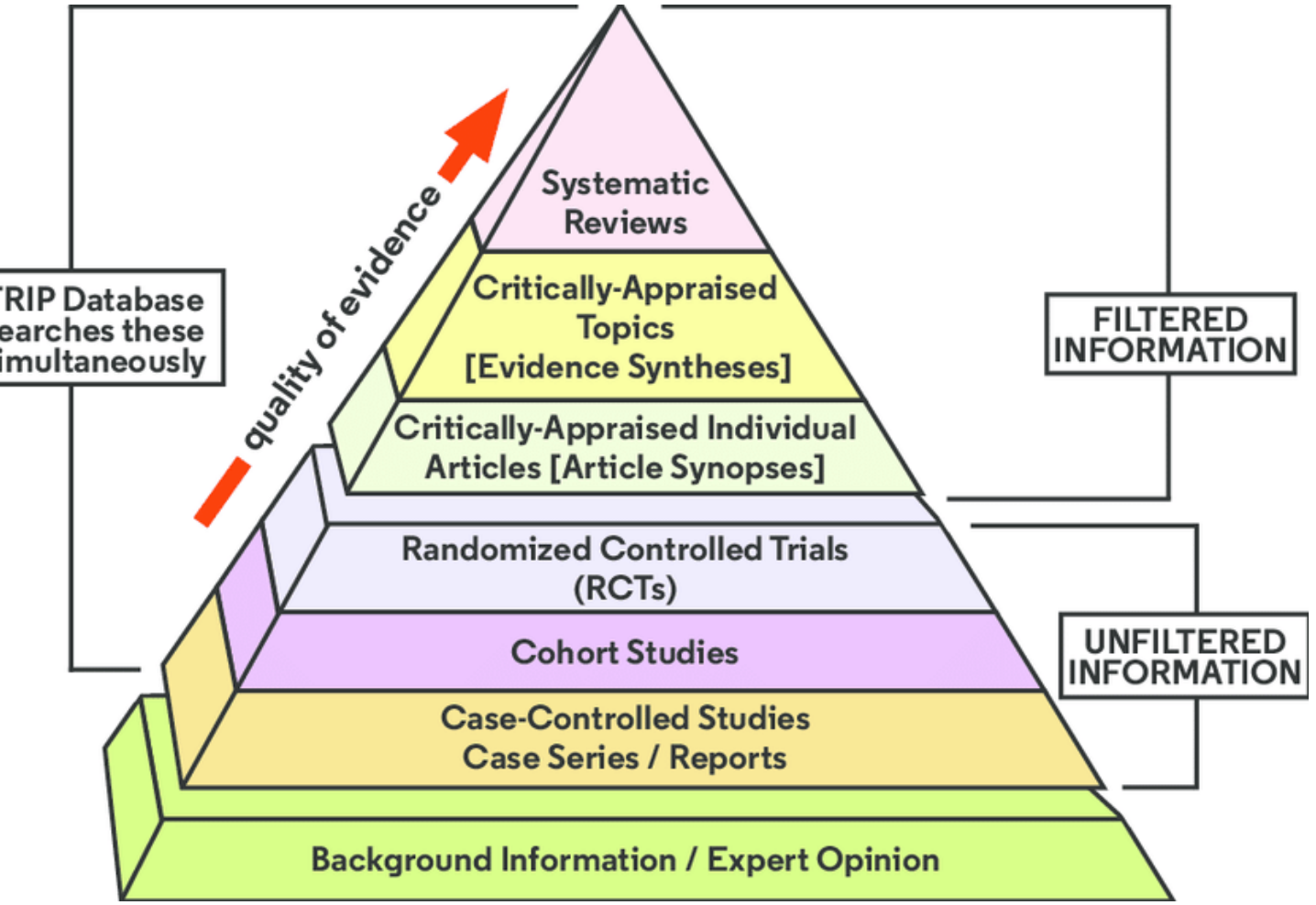
CONCLUSIONES

FORTALEZAS REVISIÓN NARRATIVA



- Revisión narrativa según una metodología (SANRA).
- Primera revisión sobre esta temática.
- Herramientas útiles para el D-N.

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CONCLUSIONES

- No existe una definición operacional CT.

- Definición preliminar:
  - Estabilidad tiempo
  - No pérdida peso intencional
  - Deseo intenso ganar peso

- Fenotipo clásico:
  - Bajo %FM
  - Bajo BMC
  - BAT aumentada
  - REE (Kcal)/LM (kg) alto
  - No alteraciones hormonales
  - No psicopatología

- Genética CT:
  - Variantes predisponen y farmacoterapia obesidad

- Se precisan más estudios con un diseño metodológico robusto que discriminen los distintos fenotipos de delgadez.

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CONCLUSIONES

-Delgadez Constitucional (CT).

-Anorexia Nerviosa restrictiva (R-AN).

-Hipertiroidismo.

-Síndrome de Marfan (MS).

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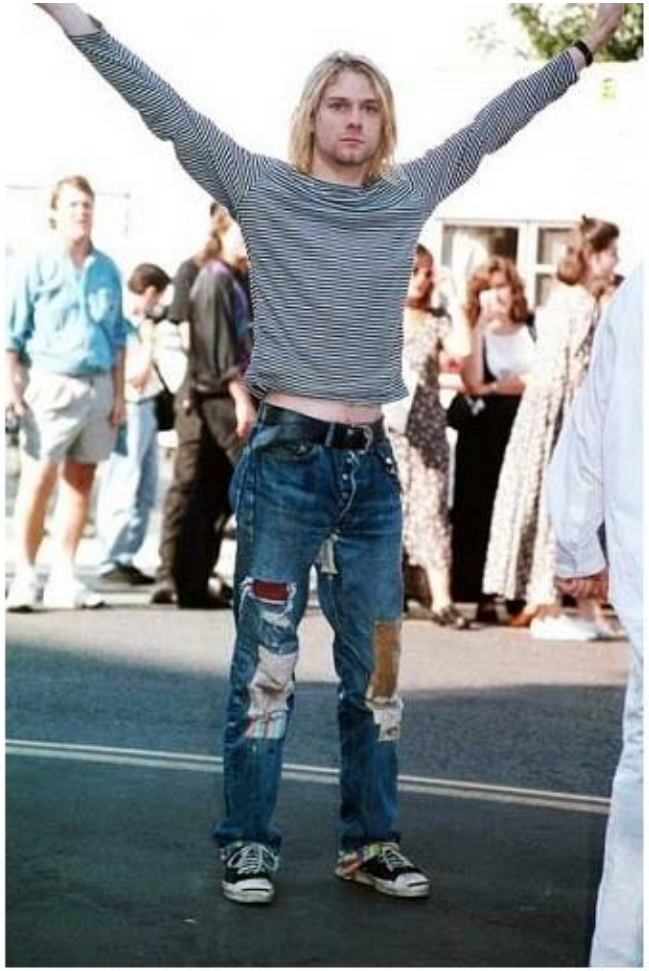
INTRODUCCIÓN

DELGADEZ CONSTITUCIONAL

Mahatma Gandhi (1869-1948)



Kurt Cobain (1967-1994)

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III Congreso de Alimentación, Nutrición y Dietética.

Combinar la nutrición comunitaria y personalizada: nuevos retos.

ONLINE, del 23 al 27 de noviembre de 2020

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