El riesgo del sedente: del colegio al trabajo

Klgo. Ignacio Castellucci

Presentación

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   B. Conceptos básicos
   C. Riesgo para la salud
3. Escolar
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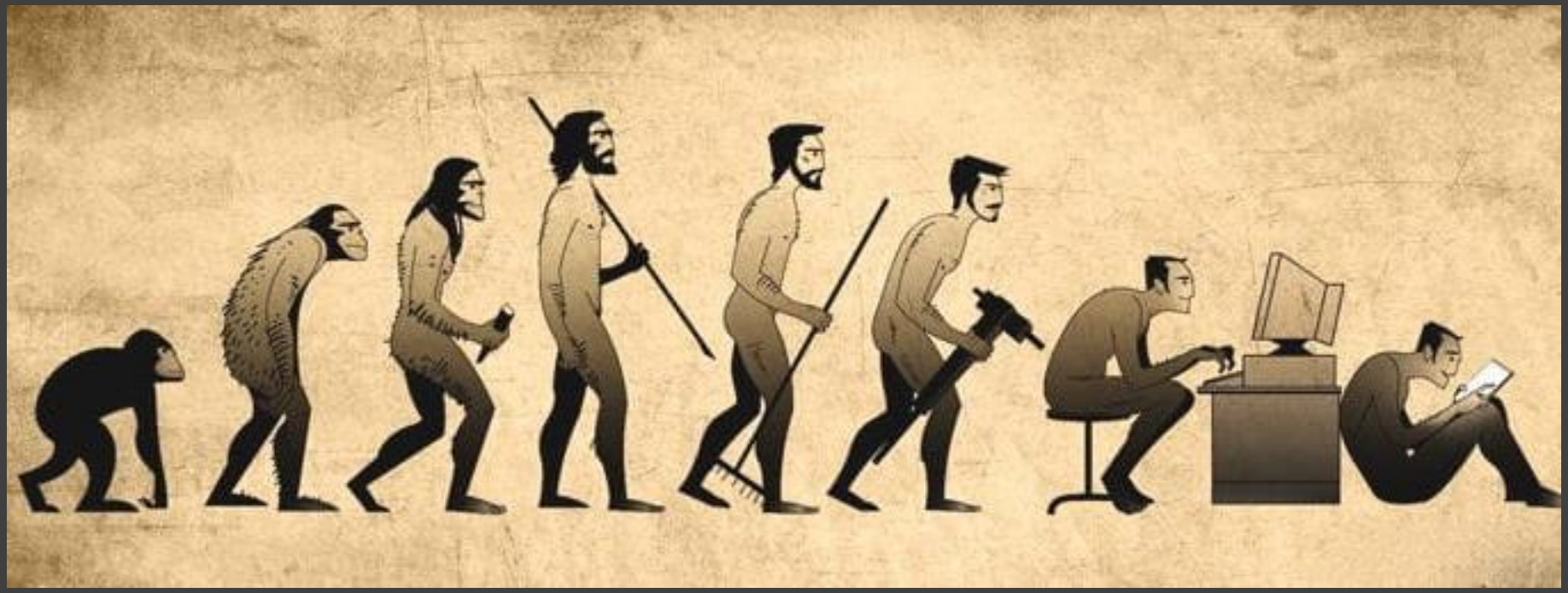
   B. Nivel de inadecuación y normativa nacional
   C. Recomendaciones
4. En la oficina
   A. Clasificación de intervenciones
   B. Resultados de las intervenciones
5. Conclusiones



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La presentación tiene como objetivo explicar el impacto del sedente durante nuestra vida, abarcando variables de diseño, antropométricas y organizacionales





Responder

Diferente ropa el mismo cuerpo

Conducta sedentaria

1. La primera de estas definiciones es puramente fisiológica y es sinónimo del extremo inferior del continuo de gasto energético <1,5 equivalentes metabólicos (MET) que, en sentido estricto, también incluye estar de pie en silencio (1,2 MET).

2. La segunda definición tiene componentes fisiológicos (<1,5 MET), así como posturales (en una postura sentada o reclinada) y contextuales (tiempos de vigilia).

Stamatakis et al., 2019

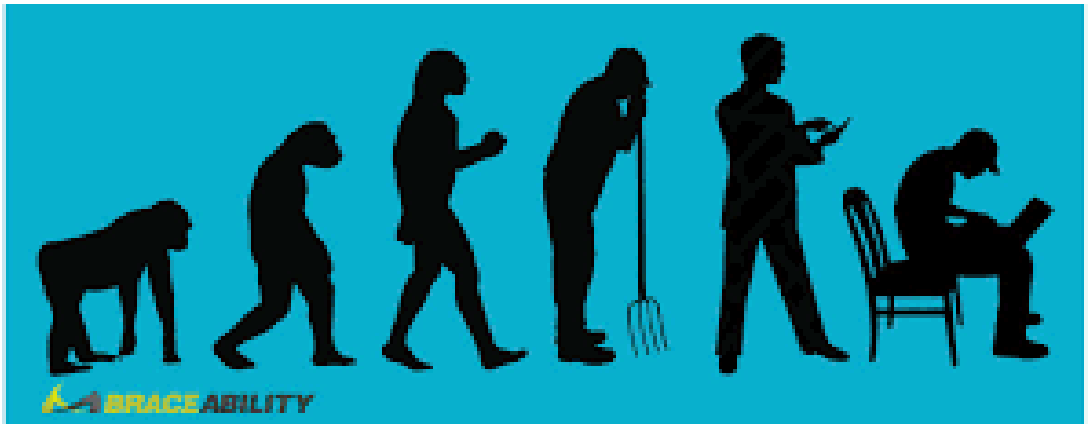
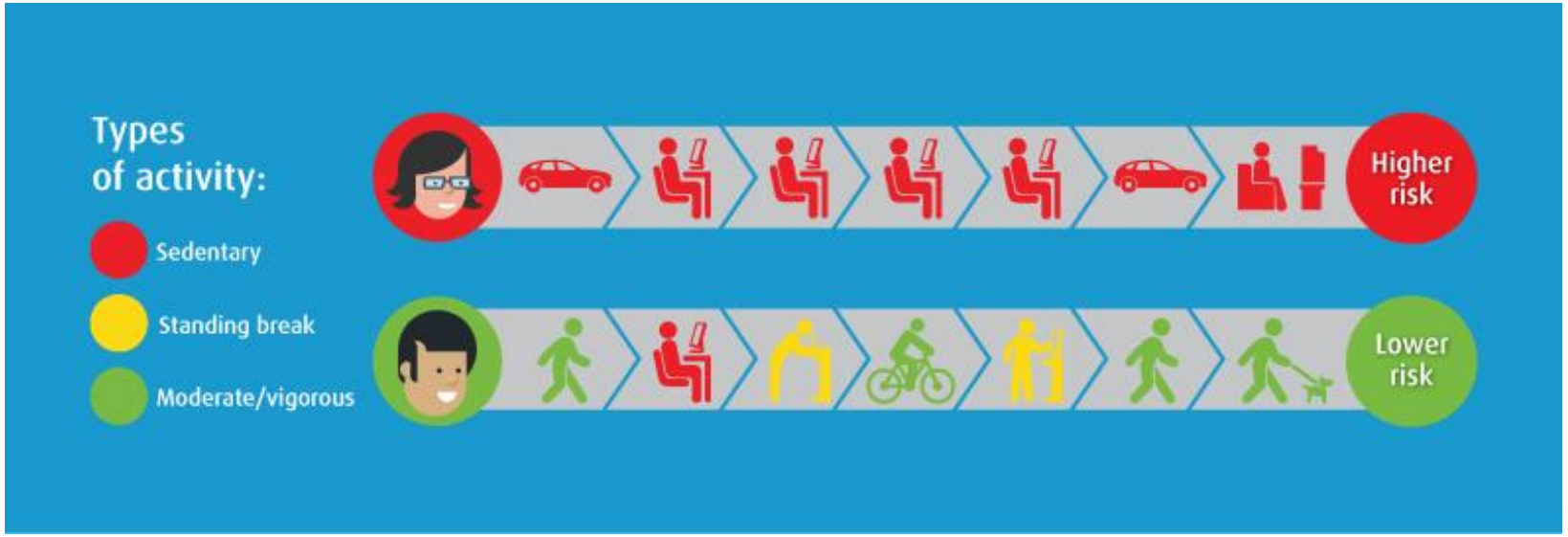


Table. Common Sedentary Behavior Activities Performed While Sitting or Reclining That Require Energy Expenditure <1.5 METs

Home	Work/School	Transportation	Leisure
TV viewing: sitting, reclining	Computer work	Driving or riding in a vehicle	Playing an instrument
Talking on the phone	Sitting		Arts and crafts
Listening to music	Writing		Knitting/sewing
Eating	Talking on the phone		Meditating
Bathing	Sitting in class		Playing cards or board games
Reading	Typing		Viewing a sports event
	Reading		Attending a religious service

Young et al., 2016

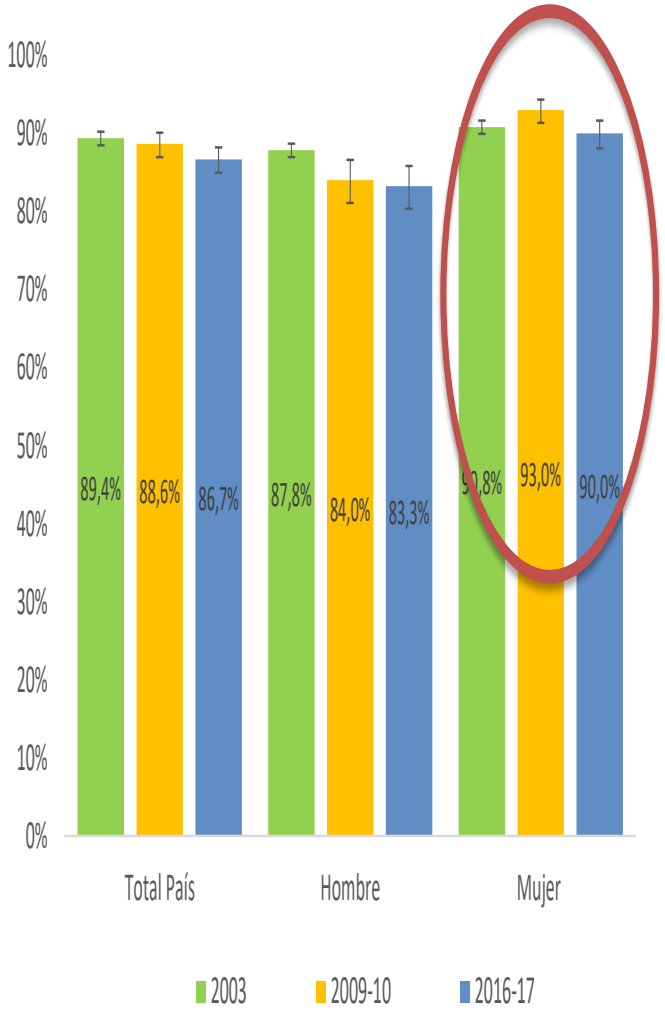


Canadian Cancer Society

Activo fisicamente

- Las recomendaciones globales de la OMS sobre actividad física para la salud establecen que “Los adultos de 18 a 64 años deben realizar al menos 150 minutos de actividad física aeróbica de intensidad moderada durante la semana, o hacer al menos 75 minutos de actividad física aeróbica de intensidad vigorosa durante todo el semana, o una combinación equivalente de actividad de intensidad moderada y vigorosa,

A pesar de las diversas intervenciones país para promover la realización regular de ejercicio físico el 86% de la población es sedentaria.

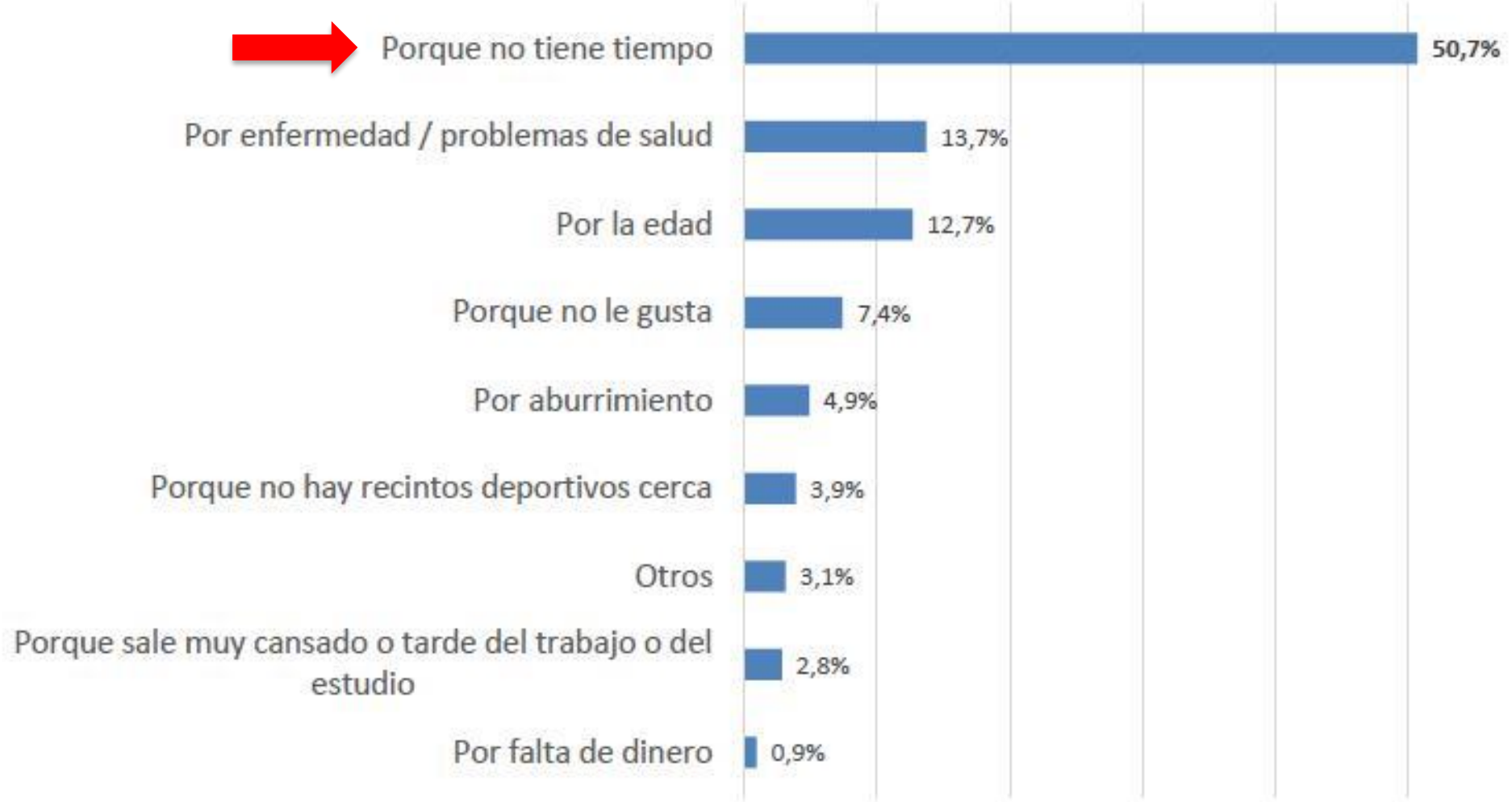


Encuesta Nacional de Salud 2016 -2017

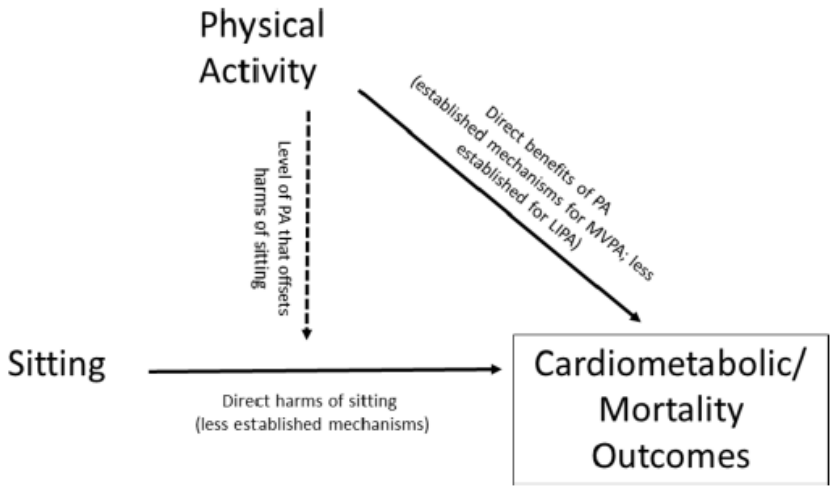
¿Por qué no se practica ejercicio físico?

Cuando preguntamos por ***¿Cuáles son las dos principales causas por las que no practica Actividad Física y/o Deporte?***

La gente en primera instancia responde:

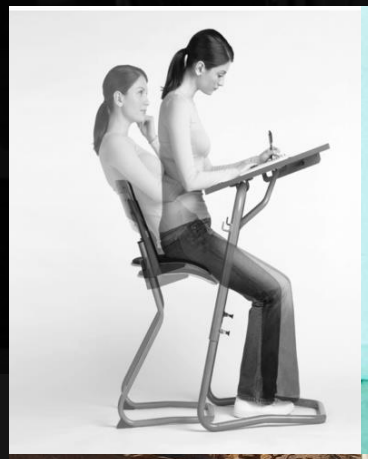


¿Cuanto es mucho?

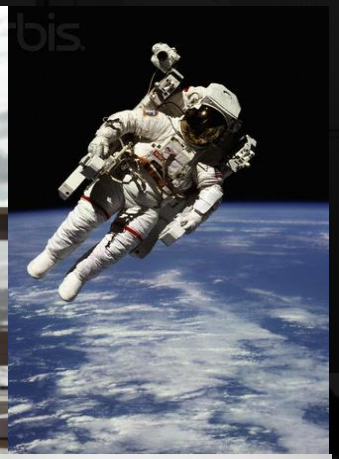


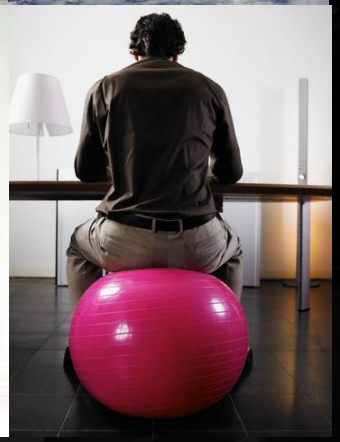
Stamatakis et al., 2019

Sedente







Evolución del trabajo


Sitting is the
new smoking.

Taylor & Francis

Health Care for Women International

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Sitting is the new smoking

Elizabeth Fugate-Whitlock

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AJPH PERSPECTIVES

Evaluating the Evidence on Sitting, Smoking, and Health: Is Sitting Really the New Smoking?

Sitting has frequently been equated with smoking, with some sources even suggesting that smoking is

Jeff K. Vallance, PhD, Paul A. Gardiner, PhD, Brigid M. Lynch, PhD, Adrijana D'Silva, MHS, Terry Boyle, PhD, Lorian M. Taylor, PhD, Steven T. Johnson, PhD, Matthew P. Bunan, PhD, and Neville Owen, PhD

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IS SITTING REALLY THE NEW SMOKING?

Vallance et al.[1] suggest that sitting is not the new smoking; however, a comparison of these two behaviors is not so simple. Their computations of the relative risk ratio for smoking are 2.80 for men and 2.76 for women, as compared with 1.22 for sitting.[1] An important factor that is not considered in this article is the proportion of the population that actually partakes in these behaviors. Roughly 15.5% of adults in the United States smoke,[2] whereas twice as many (31.9%) are inactive.[3] According to the US Census Bureau, there are roughly 252 106 000 adults in the United States[4]; therefore, approximately 39 076 500 adults smoke, and approximately 80 422 000 are inactive. The risk of smoking is in fact higher, but the number of people at risk for the health effects of inactivity is actually much greater.

Another factor to consider is the downward trend in smoking prevalence and the relatively constant percentage of inactive adults. The percentage of adult smokers has decreased by more than 5% in the last seven years[2]; however, the percentage of inactivity was 29% in 2004,[5] and there has been little subsequent change. Sitting may not be the new smoking today but may be in the future if trends continue. Policies and environments are more favorable in terms of reductions in smoking than increases in physical inactivity. Bans on smoking, increased taxes, and limited advertising continue to contribute to decreases in smoking in the United States. However, only 20% of American jobs meet the criteria for physical activity requirements, down from 50% in the 1960s.[6] Furthermore, auto-centric cities, unsafe neighborhoods and declining physical education in schools no longer make the active choice the easy choice.

Finally, sitting and inactivity are complex behaviors, and the most effective ways of studying and measuring them are still emerging. Smoking is easier to quantify, and the impact on health has been known for more than six decades. We know the benefits of physical activity for health, but the amounts and types of inactivity that have the most detrimental effects on health are yet to be determined.

The use of Betteridge's Law of Headlines in the Vallance et al. article lessens the power of physical inactivity as a risk factor; the "law" is an adage, not necessarily a fact in every circumstance (e.g., nonpolar questions). The message of the article downplays the impact of physical activity on population health. Public health practitioners need to be ready with a response to people who say "I'm inactive, but at least I don't smoke!" AJPH

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CONTRIBUTORS

Both authors contributed equally to this letter.

CONFLICTS OF INTEREST

We declare no conflicts of interest.

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1. Vallance JK, Gardiner PA, Lynch BM, et al. Evaluating the evidence on sitting, smoking, and health: is sitting really the new smoking? *Am J Public Health*. 2018;108(11):1478–1482.

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6. Church T, Martin CK. The obesity epidemic: a consequence of reduced energy expenditure and the uncoupling of energy intake? *Obesity (Silver Spring)*. 2018;26(1):14–16.

IS SITTING REALLY THE NEW SMOKING?

I was struck by the recent Vallance et al. article comparing the deleterious health effects of smoking versus sitting.[1] Their recommendation to stop using this comparison seems a bit nit-picky. As an absolute risk factor, they do a fine job detailing the much more potent negative impact of smoking on one's health than sitting. But they miss a few key points.

First, sitting is associated with a risk for worse health outcomes.[2,3] The effort to convince people to stand may be easier than getting them to stop smoking. Second, because the population prevalence of sitting is substantially higher than the prevalence of tobacco use, the overall population impact is important: perhaps not quite as large an impact as tobacco, but still within an order of magnitude. Sitting too much leads to avoidable deaths.

Third, communication is a crucial element for public health success.[4,5] Members

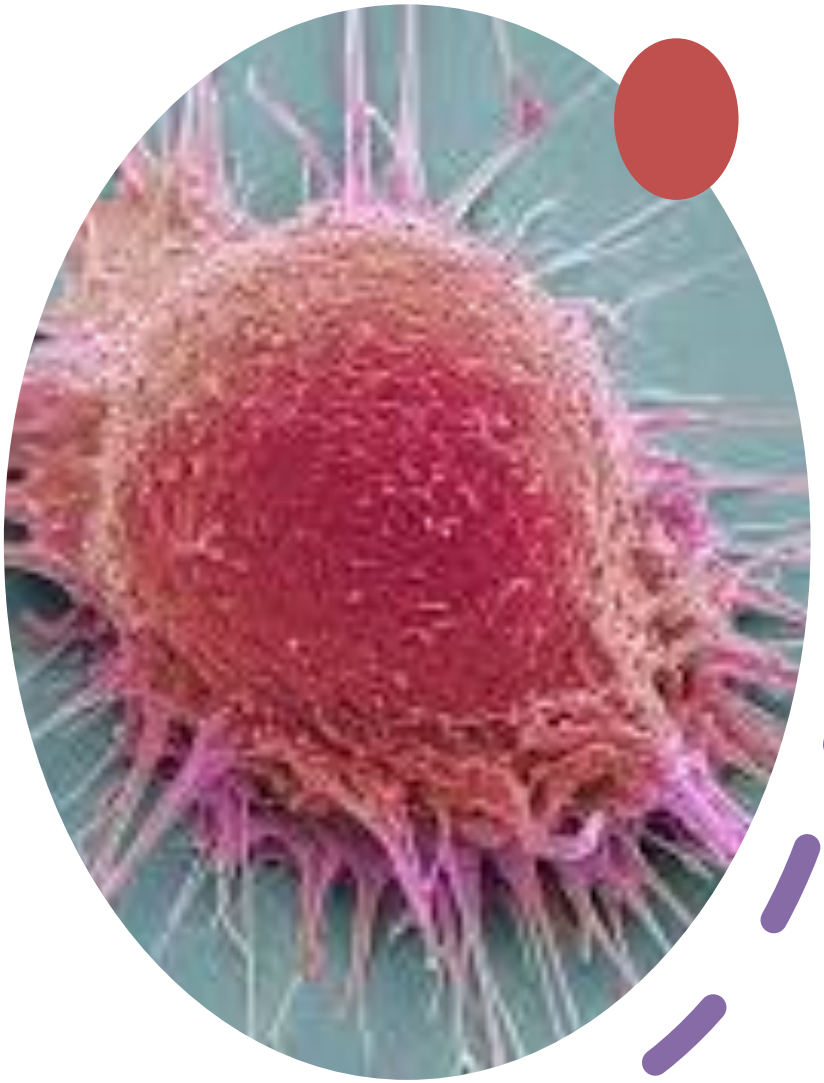
Todo tipo de muerte

- En comparación con los que informaron estar sentados menos de 4 horas por día, hubo un aumento del 15% en el riesgo de muerte (por todas las causas) en los que estaban sentados de 8 a 11 horas por día y un aumento del 40% en el riesgo de muerte en aquellos sentado 11 o más horas al día (van der Ploeg et al. 2013)
- Se encontraron asociaciones significativas de la razón de riesgo (HR) con la mortalidad por todas las causas (HR, 1.220 [IC del 95%, 1.090 a 1.410]) (Biswas et al., 2015)
- La razón de riesgo ajustada para la mortalidad durante un tiempo sentado ocupacional más prolongado fue 1,16 (IC del 95%: 1,05-1,27). (Sakaue et al., 2020)

Cardiovascular

- Mortalidad por enfermedad cardiovascular (HR, 1.150 [IC, 1.107 a 1.195]), incidencia de enfermedad cardiovascular (HR , 1,143 [IC, 1,002 a 1,729]) e incidencia de diabetes tipo 2 (HR, 1,910 [CI, 1.642 a 2.222]). (Biswas et al., 2015)
- Diabetes tipo 2 1.88 (1.62 to 2.17) y enfermedades cardiovasculares 1.14 (1.09 to 1.19) (Heron et al., 2019)

- Incidencia de cáncer (HR, 1,130 [IC, 1,053 a 1,213]) (Biswas et al., 2015)
- Cáncer de pulmón 1,27 (1,06 a 1,52), Cáncer de colon 1,30 (1,12 a 1,49) y Cáncer de endometrio 1,28 (1,08 a 1,53) (Heron et al., 2019



2019 NCMIC/JMPT Research Award

Association of Exposures to Seated Postures With Immediate Increases in Back Pain: A Systematic Review of Studies With Objectively Measured Sitting Time

Diana E. De Carvalho, DC, PhD,[a] Katie de Luca, B App Sci (Ex & Sp Sci), M Chiro, PhD,[b] Martha Funabashi, PhD,[c] Alexander Breen, PhD,[d] Arnold Y.L. Wong, PT, MPhil, PhD,[e] Melker S. Johansson, MSc,[f,g] Manuela L. Ferreira, BPT, MSc, PhD,[h] Michelle Swab, MA, MLIS,[i] Gregory Neil Kawchuk, DC, PhD,[j] Jon Adams, PhD,[k] and Jan Hartvigsen, DC, PhD[f,l]



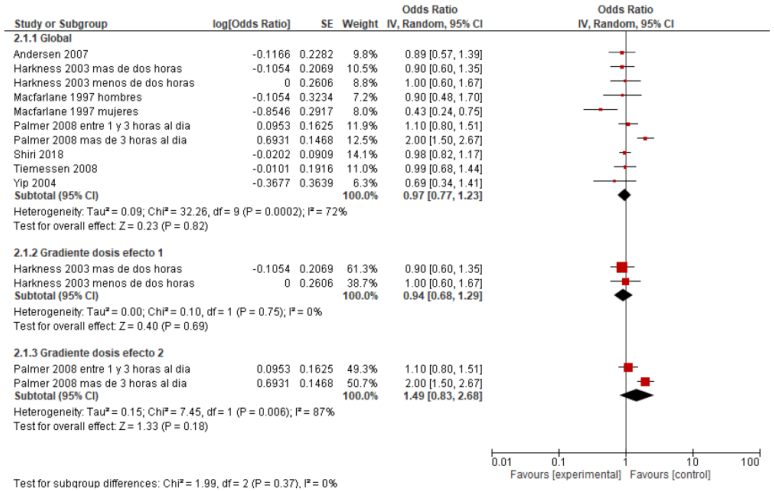
- Pasar gran parte del día sentado se ha asociado con un aumento de los trastornos musculoesqueléticos, específicamente el dolor lumbar (LBP) (Corlett, 2008; Kirk y Rhodes, 2011; Parry y Straker, 2013).
- Trabajadores con dolor lumbar crónico demostraron una posible tendencia hacia un comportamiento sedente más estático en comparación con sus contrapartes sin dolor (Bontrup et al., 2019).

Factores laborales en desarrollo de lumbago crónico en trabajadores.

Pacientes	Trabajadores.
Exposición	Factores laborales.
Desenlace	Desarrollo de lumbago crónico.

Factor	Riesgo	Certeza de la evidencia (GRADE)
De pie	OR: 1,28 (1,03 a 1,59)	⨁⨁◯◯[1,2,3,4,7] Baja
Sentado	OR: 0,97 (0,77 a 1,23)	⨁◯◯◯[1,2,3,7] Muy baja
Arrodillarse	OR: 1,33 (IC 95% 1,05 a 1,69)	⨁⨁◯◯[1,2,3,4,7] Baja
En cuclillas	OR: 1,38 (IC 95% 1,08 a 1,76)	⨁⨁◯◯[1,2,3,4,7] Baja

Metanálisis : lumbago crónico por trabajar sentado



Bravo-Jeria R, Ortiz-Munoz L, Bravo-Soto GA, Morel-Marambio M, Verdugo-Paiva F, Rada G. Condiciones laborales como factor de riesgo en enfermedades musculoesqueleticas de columna: una revision sistematica. Revision sistematica. Santiago; Centro Evidencia UC, Pontificia Universidad Catolica de Chile; 2019.

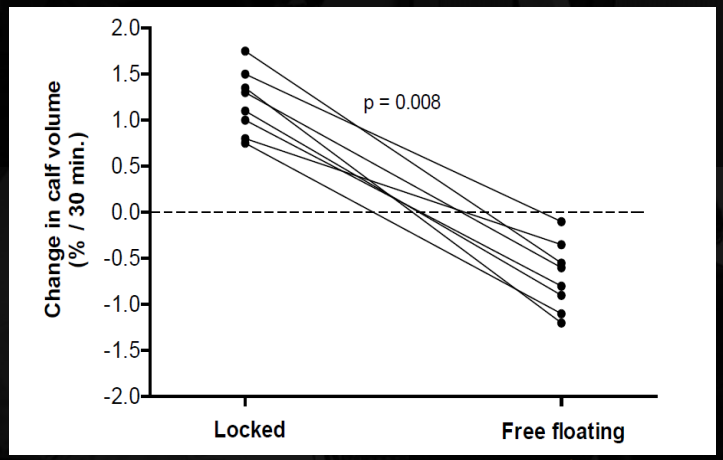
- **Los niveles más altos de comportamiento sedentario parecen estar asociados con un mayor riesgo de angustia psicológica (Hamer, Coombs y Stamatakis, 2014; Kilpatrick, Sanderson, Blizzard, Teale y Venn, 2013), una reducción del bienestar mental general (Atkin, Adams, Bull, & Biddle, 2012).**
- **Estar sentado durante más de 6 horas diarias para trabajar también se ha asociado con un aumento de la angustia psicológica entre los trabajadores de oficina australianos (Kilpatrick et al., 2013).ms , Bull y Biddle, 2012) y depresión posparto (Teychenne y York, 2013).**

Trabajo en Sedente

Desventajas

- Disminuye la nutrición de los cartílagos articulares → aparición de artrosis

- Caída de órganos de la cavidad abdominal produce:
  - -Enfermedades orgánicas (mala digestión, gastritis, estreñimiento)
  - -Dolor (cervicalgias, lumbalgias)
  - -Problemas de circulación (várices, tanto en órganos como en miembros inferiores).

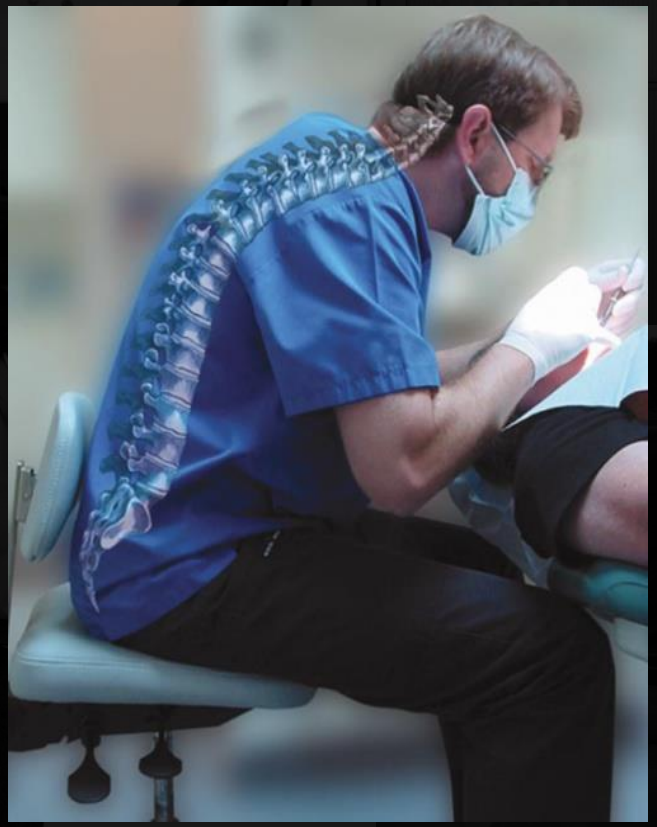


Stranden, 2000.

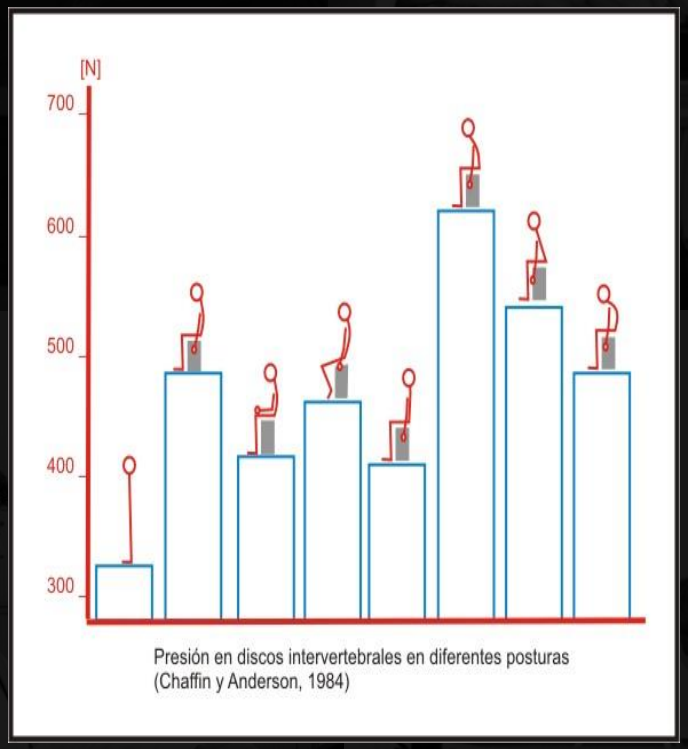
Trabajo en Sedente

Desventajas

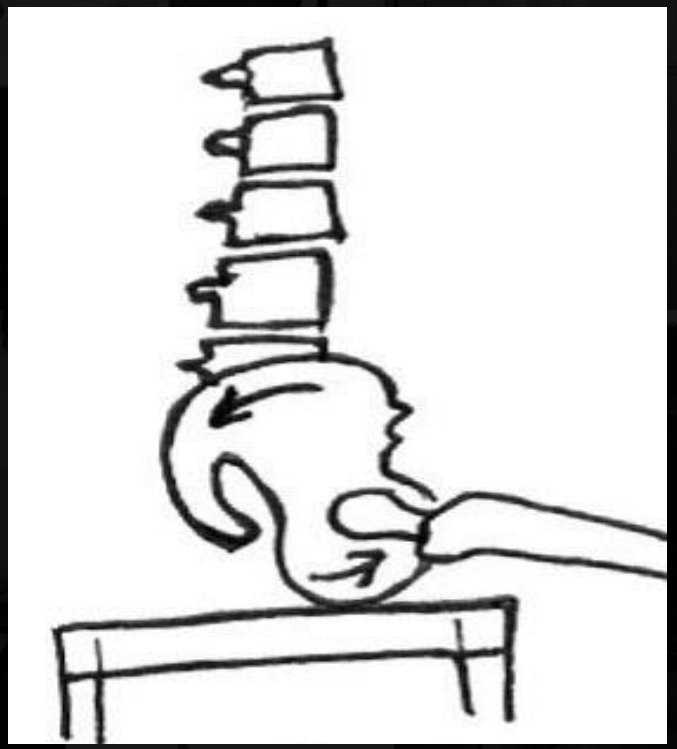
- Rectificación de columna lumbar → desequilibrio de presiones en los discos intervertebrales,
- ↓ capacidad de movimiento de columna
- Mantiene una postura crónicamente forzada → aparición de dolores.
- ↓ del retorno venoso.
- ↓ propiocepción.



Trabajo en Sedente



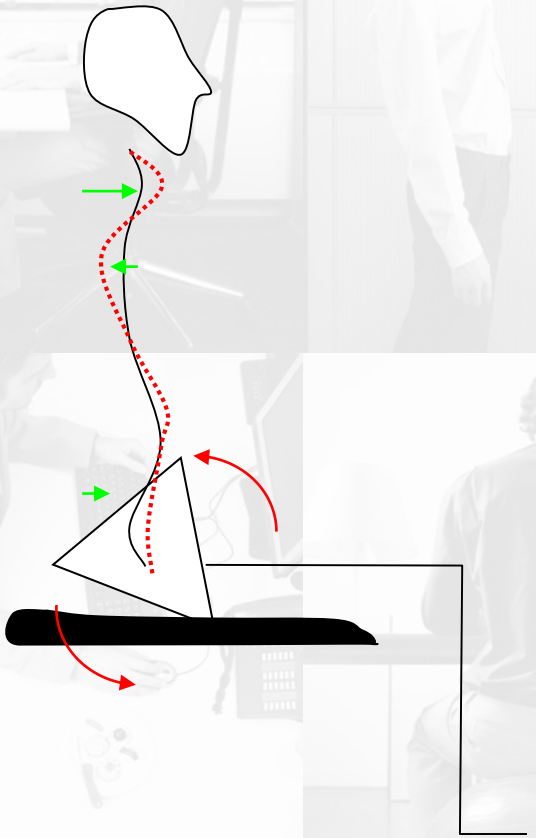
Presión en discos intervertebrales en diferentes posturas
(Chaffin y Anderson, 1984)



Trabajo en Sedente

Tipo de postura

- Rectificación lumbar:
  - lordosis dorsal baja
  - cifosis dorsal alta
  - aumento lordosis cervical (enfermedad del oficinista).
- Contracción estática nivel dorsal → dolores interescapulares.
- Mayor trabajo de los músculos fásicos.
- Ligamentos intervertebrales en tensión.
- Pº intradiscal 3 últimos segmentos lumbares corresponde a soportar 140 % peso corporal.
- Dificulta flujo sanguíneo por obstrucción del sistema arterio-venoso a nivel del ligamento inguinal.

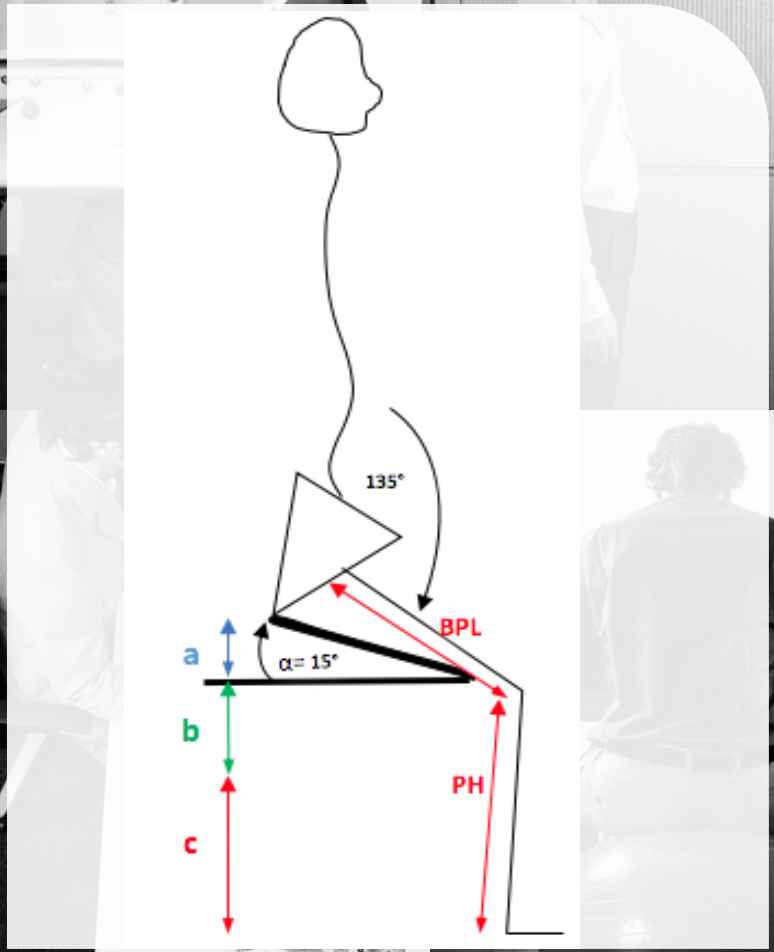


Freres y Mairlot,2000.

Trabajo en Sedente

Tipo de postura

- Ángulo “ideal” pelvis-muslos > 90º (entre 120º y 135°).
- Permite mantener el equilibrio articulación cervico- dorsal
- Asegurar apoyo correcto de codos antebrazos evitando cifosis lumbar y actitud escoliótica; activando facultades de atención.
- Respeta
  - anteversión pélvica
  - lordosis lumbar fisiológica
  - parcialmente cifosis dorsal y lordosis cervical (ligeramente rectificadas)
- Músculos posturales trabajan correctamente.
- Pº intradiscal de 3 últimos segmentos lumbares corresponde a soportar 90% peso corporal



¿La solución es nos paramos?

- La postura bípeda ocupacional prolongada se ha asociado con síntomas M.E que incluyen dolor lumbar (Andersen 2007; Tissot 2009) y dolor en las extremidades inferiores (Messing 2008; Reid 2010), particularmente en los trabajadores con exposición alta (Waters 2015).

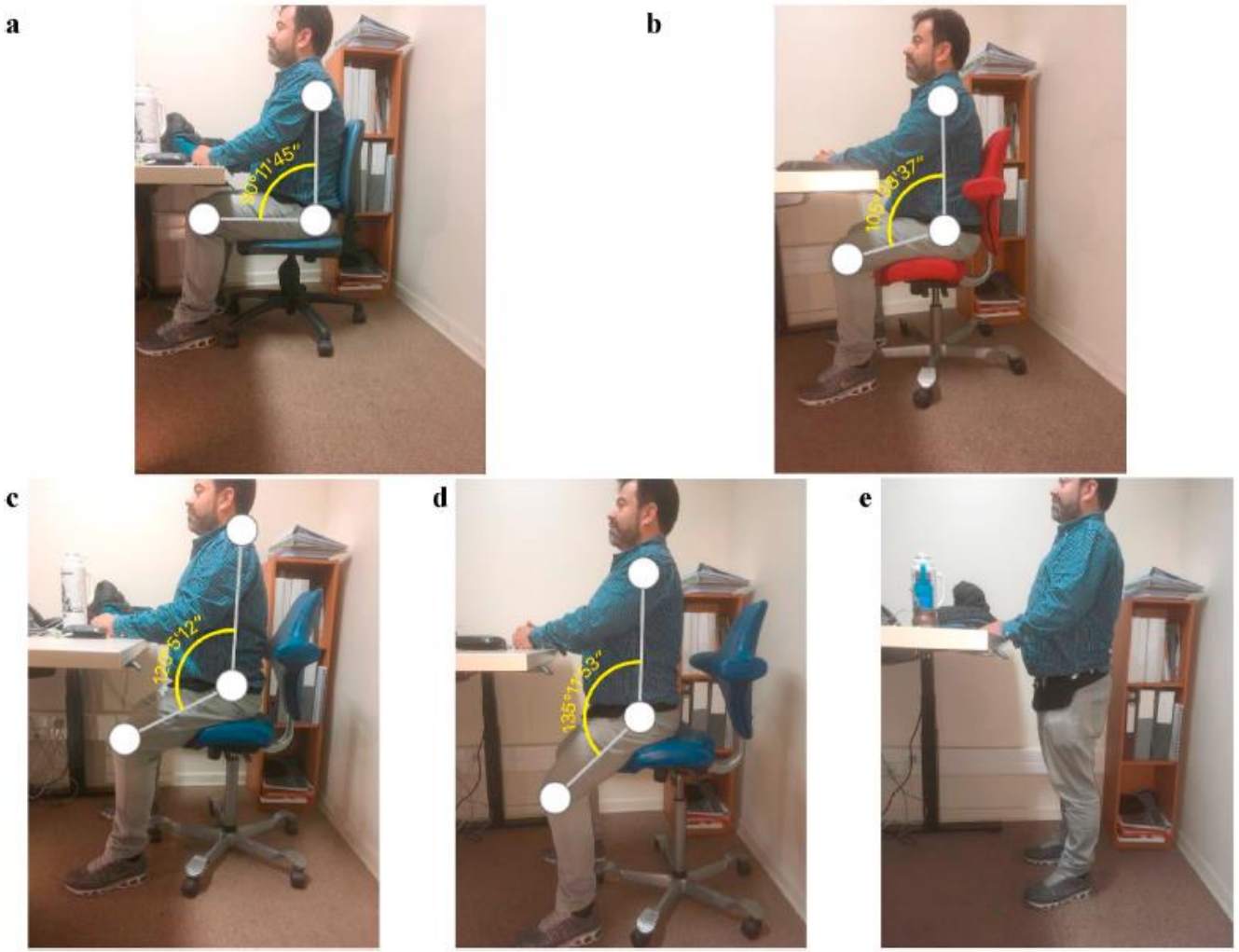


Fig. 1. Hybrid sitting postures. a) Traditional sitting with 90° trunk/thigh angle; b) perching with 105° trunk/thigh angle; c) perching with 120° trunk/thigh angle; d) perching with 135° trunk/thigh angle; and e) standing.

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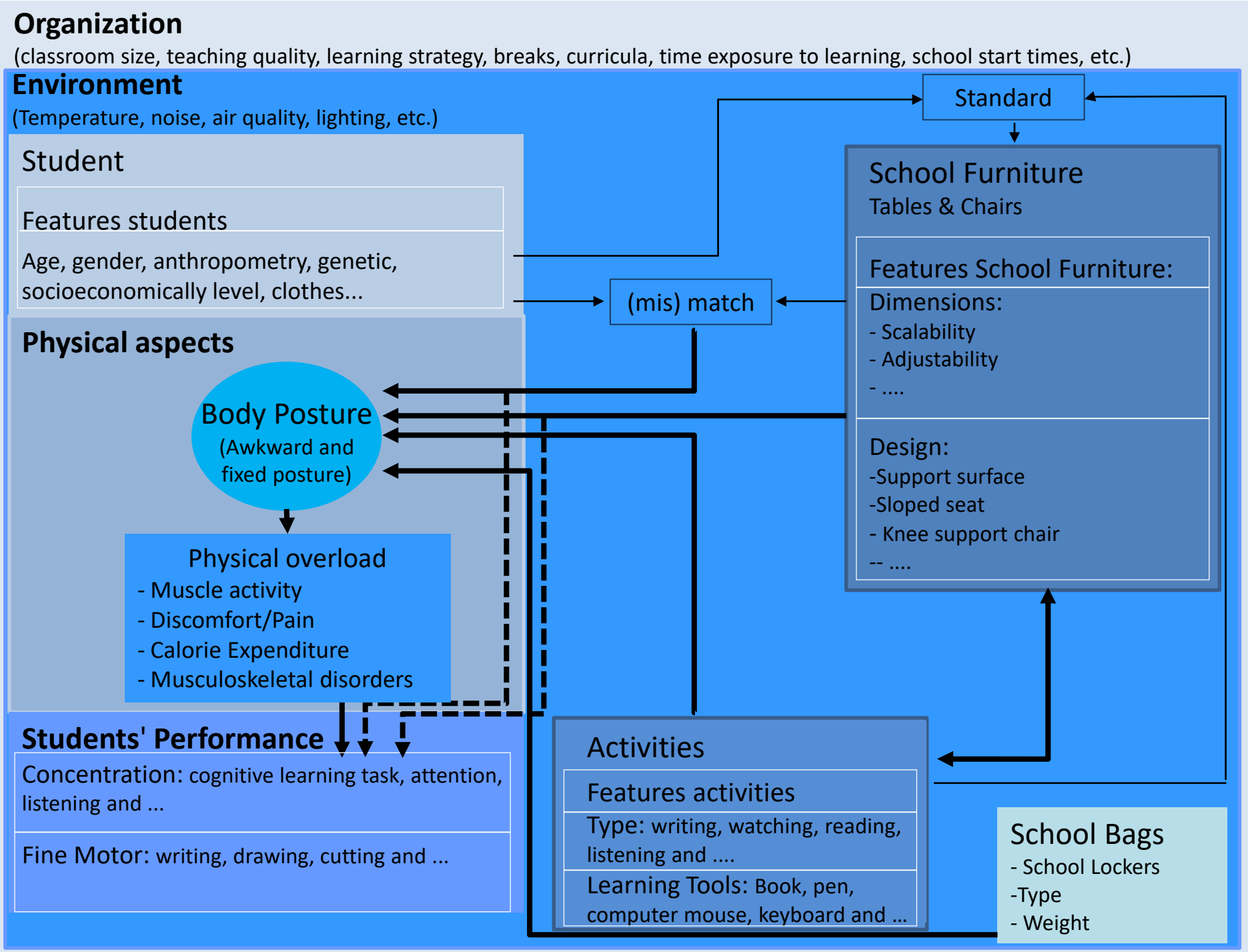
Introducción

¿Porqué?


Organization
(classroom size, teaching quality, learning strategy, breaks, curricula, time exposure to learning, school start times, etc.)
Environment
(Temperature, noise, air quality, lighting, etc.)
Standard
Student
Features students
Age, gender, anthropometry, genetic, socioeconomically level, clothes...
School Furniture
Tables & Chairs
Features School Furniture:
Dimensions:
- Scalability
- Adjustability
- ....
Design:
-Support surface
-Sloped seat
- Knee support chair
-- ....
(mis) match
Physical aspects
Body Posture
(Awkward and fixed posture)
Physical overload
- Muscle activity
- Discomfort/Pain
- Calorie Expenditure
- Musculoskeletal disorders
Students' Performance
Concentration: cognitive learning task, attention, listening and ...
Fine Motor: writing, drawing, cutting and ...
Activities
Features activities
Type: writing, watching, reading, listening and ....
Learning Tools: Book, pen, computer mouse, keyboard and ...
School Bags
- School Lockers
-Type
- Weight

Introducción

¿Porqué?

- Estar sentado por largos periodos de tiempo en el colegio está asociado a molestias y dolor del sistema músculo-esquelético (Fallon and Jameson 1996).
- Hábitos del sedente en la niñez son difíciles de modificar (Yeats, 1997).
- Alumnos que utilizan mobiliario adecuado, mejoran su postura, disminuyen el nivel de molestias y mejoran su capacidad manual (Batistão et al. 2012; Milanese and Grimmer 2004; Murphy et al. 2007; Parush et al. 1998; Ramadan 2011; Smith-Zuzovsky and Exner 2004 Straker et al. 2002

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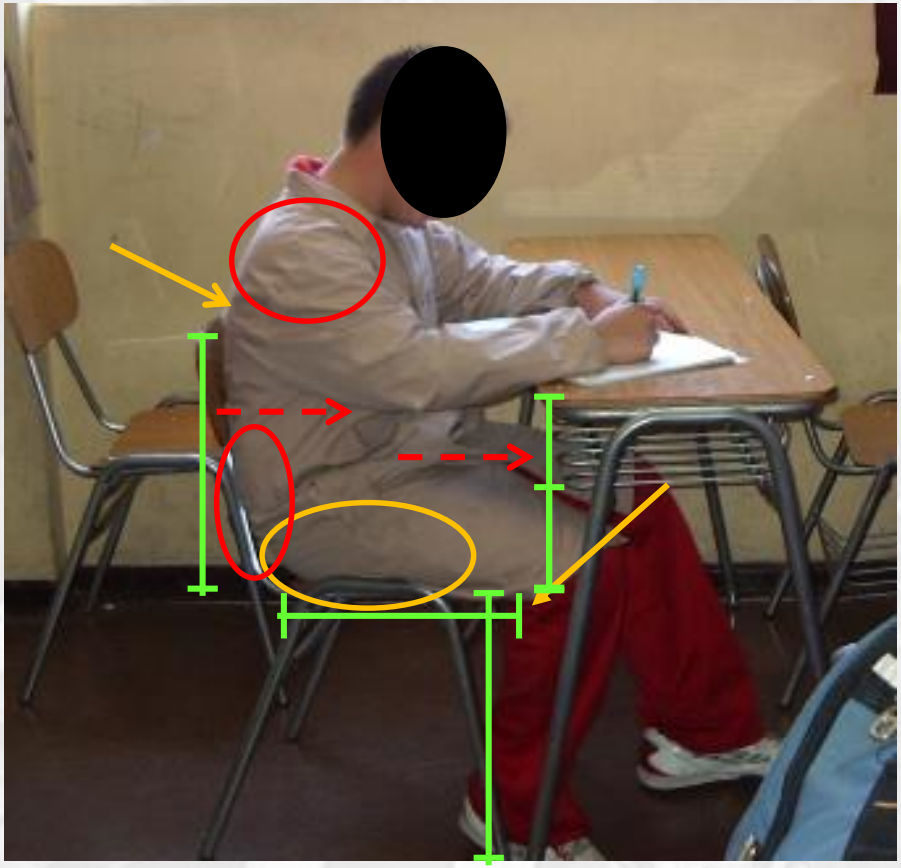
Introducción

¿Qué pasa si es inadecuado?



Introducción

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http://dx.doi.org/10.1080/00140139.2016.1170889

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The influence of school furniture on students' performance and physical responses: results of a systematic review

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ABSTRACT

The purpose of this study was to determine, using a systematic review, whether the design and/or dimensions of school furniture affect the students' physical responses and/or their performance. Of the review studies, 64% presented positive results, i.e. proven effects; 24% presented negative effects or no change/effect; and the remaining 12% showed an unclear effect. The compatibility between school furniture dimensions and students' anthropometric characteristics was identified as a key factor for improving some students' physical responses. Design characteristics such as high furniture, sit-stand furniture, and tilt tables and seats also present positive effects. Finally, we concluded that further research should be conducted exploring various aspects of those variables, particularly focusing on more objective measures complemented by controlled and prospective design.

Practitioner Summary: A systematic review of the literature presents a clearly positive effect of school furniture dimensions on students' performance and physical responses. Similar results appeared when school furniture design was tested. However, studying the effects of design and dimensions together produced an unclear positive effect.

ARTICLE HISTORY
Received 14 November 2014
Accepted 17 March 2016

KEYWORDS
Classroom; workstation; design; dimension

Resultados

Influence of school furniture in the students' performance and physical aspects.

	Aspectos Físicos	Rendimiento	Aspectos Físicos y Rendimiento	Total
Dimension	7	1	0	8
Diseño	4	1	2	7
Diseño y dimension	6	1	3	10
Total	17	3	5	25

- Rendimiento escolar, 2 de 3 presentaron resultados positivos.
- 5 de los 7 estudios revisados encontraron que un cambio en las dimensiones del mobiliario escolar (mejor adecuación) resultó en una mejora en la postura, EMG y malestar / dolor.
- Los 5 estudios analizaron los efectos tanto en el rendimiento de los estudiantes como en los aspectos físicos presentaron resultados +.

Learning Environments Research
https://doi.org/10.1007/s10984-018-9271-3

The effects of classroom-based dynamic seating interventions on academic outcomes in youth: a systematic review

Scott Rollo[1] · Lauren Crutchlow[1] · Taniya S. Nagpal[1,2] · Wuyou Sui[1] · Harry Prapavessis[1]

Received: 30 January 2018 / Accepted: 6 August 2018

International Journal of Environmental Research and Public Health

Article

Impacts of a Standing Desk Intervention within an English Primary School Classroom: A Pilot Controlled Trial

Aron P. Sherry [1,2,*], Natalie Pearson [1], Nicola D. Ridgers [3], William Johnson [1], Sally E. Barber [4], Daniel D. Bingham [4,5], Liana C. Nagy [6] and Stacy A. Clemes [1,2]

Clemes *et al. International Journal of Behavioral Nutrition and Physical Activity* (2020) 17:55
https://doi.org/10.1186/s12966-020-00958-z

International Journal of Behavioral Nutrition and Physical Activity

RESEARCH Open Access

Stand Out in Class: restructuring the classroom environment to reduce sitting time – findings from a pilot cluster randomised controlled trial

Stacy A. Clemes[1,2*], Daniel D. Bingham[3], Natalie Pearson[1], Yu-Ling Chen[1], Charlotte L. Edwardson[2,4], Rosemary R. C. McEachan[3], Keith Tolfrey[1,2], Lorraine Cale[1], Gerry Richardson[5], Mike Fray[6], James Altunkaya[5], Stephan Bandelow[1,7], Nishal Bhupendra Jaicim[8], Jo Salmon[9], David W. Dunstan[10,11] and Sally E. Barber[3]

Ergonomics
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http://www.tandfonline.com/loi/terg20

The effect of secular trends in the classroom furniture mismatch: support for continuous update of school furniture standards

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Applied Ergonomics 46 (2015) 201–211

Contents lists available at ScienceDirect

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journal homepage: www.elsevier.com/locate/apergo

Analysis of the most relevant anthropometric dimensions for school furniture selection based on a study with students from one Chilean region

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[a] Escuela de Kinesiología, Facultad de Medicina, Universidad de Valparaíso, Valparaíso, Chile
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Work 53 (2016) 585–595
DOI:10.3233/WOR-152233
IOS Press

Evaluation of the match between anthropometric measures and school furniture dimensions in Chile

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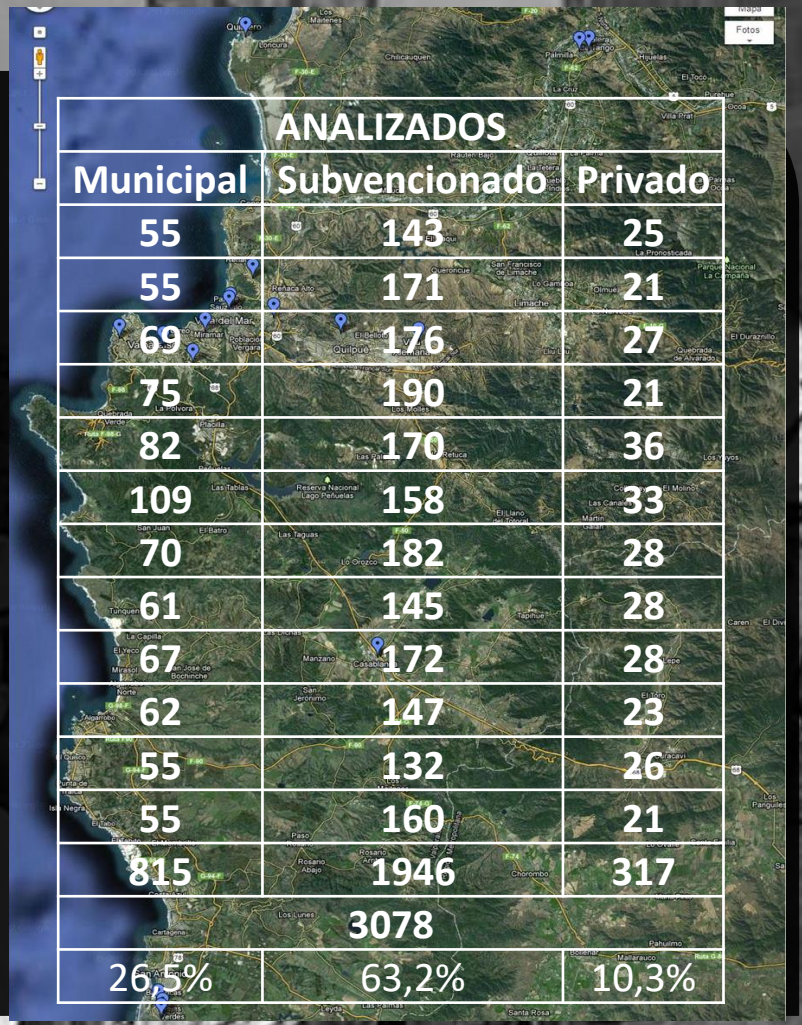
Received 23 January 2014
Accepted 15 February 2015

Materiales y Métdos

Muestra

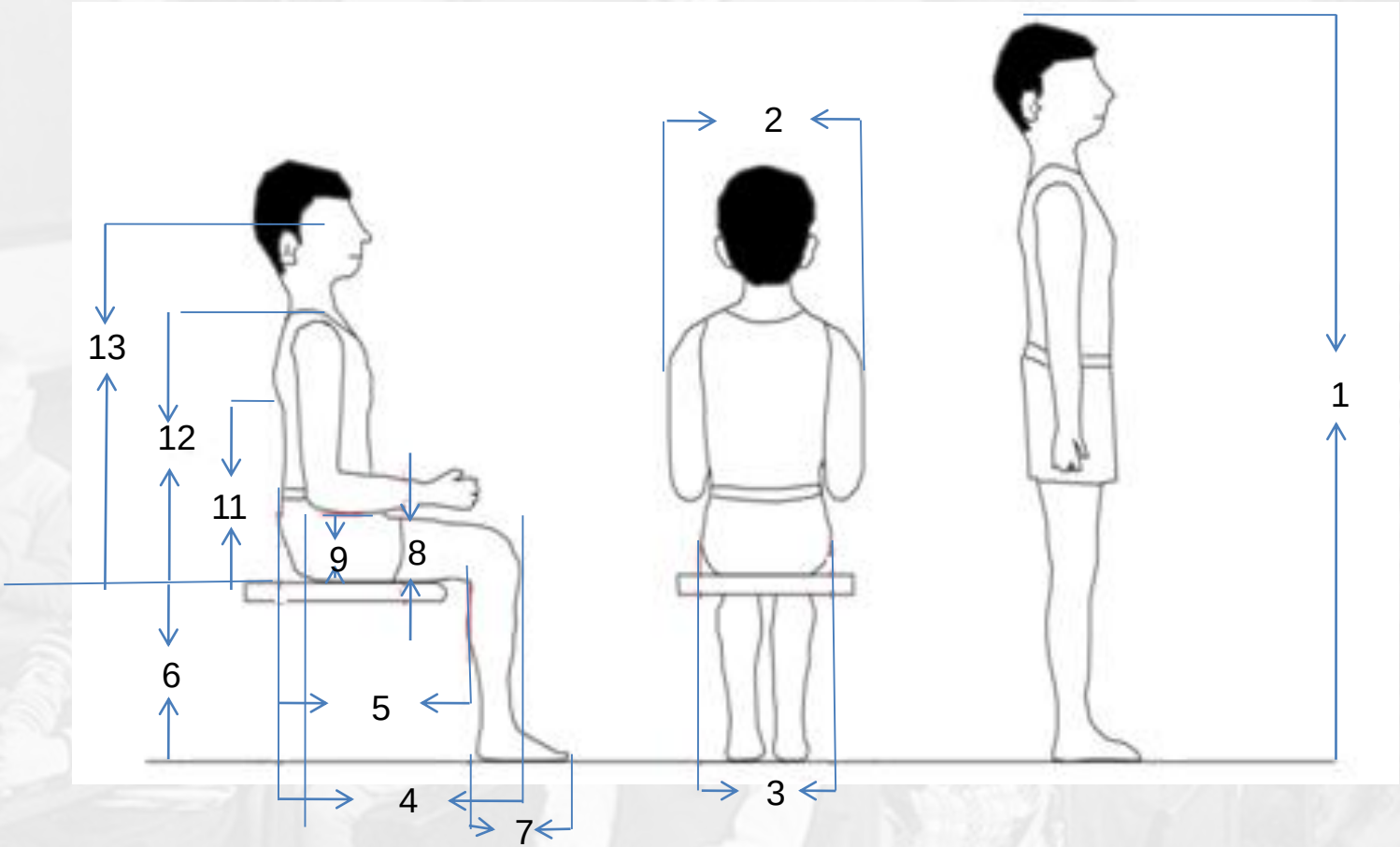
- En este estudio de corte transversal se incluyeron 3.078 alumnos, pertenecientes a 18 establecimientos educacionales
- El grupo consta de 1.397 mujeres y 1.681 hombres con edad promedio de 11,7±3,5



ANALIZADOS		
Municipal	Subvencionado	Privado
55	143	25
55	171	21
69	176	27
75	190	21
82	170	36
109	158	33
70	182	28
61	145	28
67	172	28
62	147	23
55	132	26
55	160	21
815	1946	317
3078		
26,5%	63,2%	10,3%

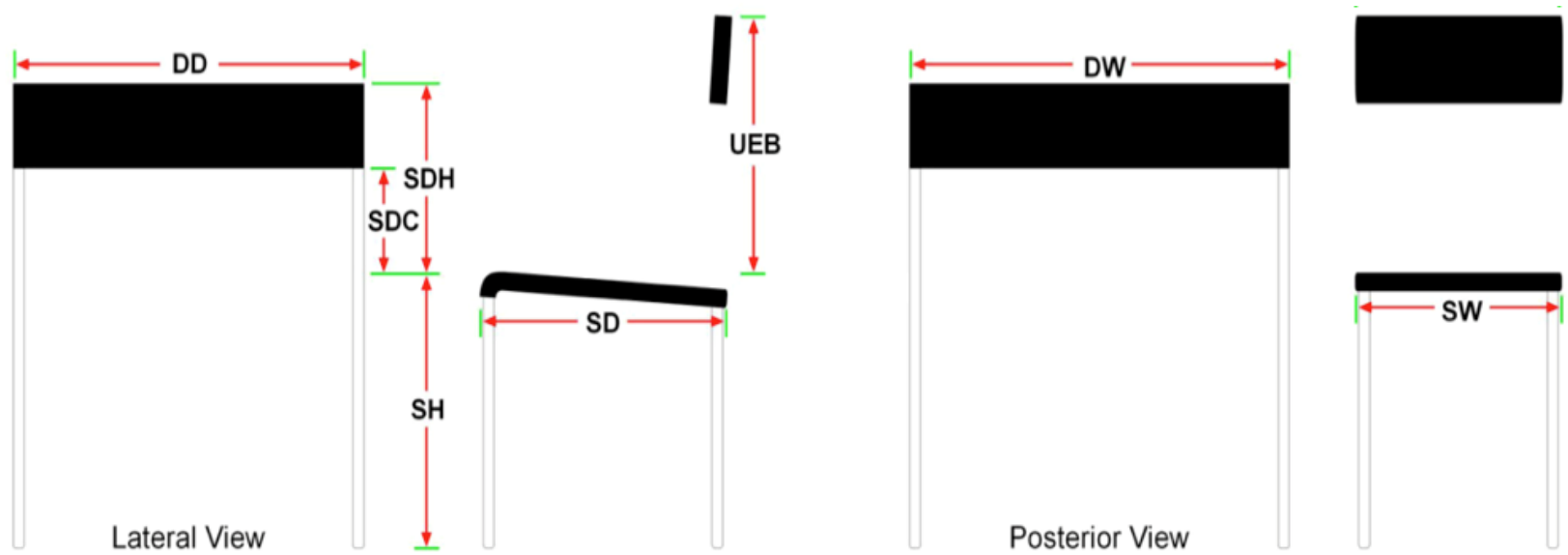
Materiales y Métodos

Medidas antropométricas



Materiales y Métodos

Medidas mobiliarios



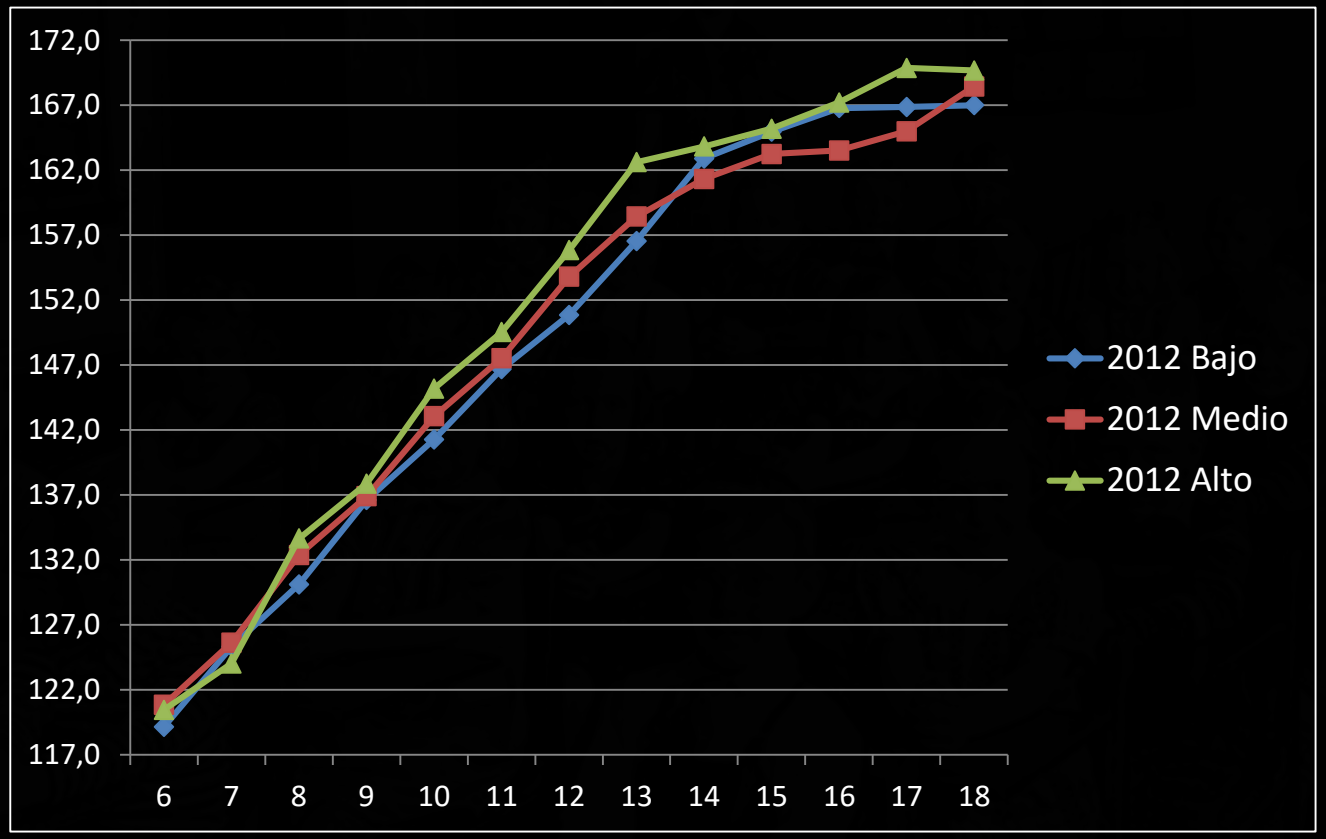
Materiales y Métodos

Formulas

Medidas Mobiliario	Formulas de adecuación
SH	(PH + SC) cos30º ≤ SH ≤ (PH + SC) cos5º
SD	0.80BPL ≤ SD ≤ 0.95BPL
SW	HW < SW
UEB	SUH ≥ UEB
SDC	TT + 2 < SDC
DH	(SH - (sin5° SD)) + EHS ≤ DH ≤ (SH - (sin5° SD)) + EHS*0.8517+ SHH*0.1483

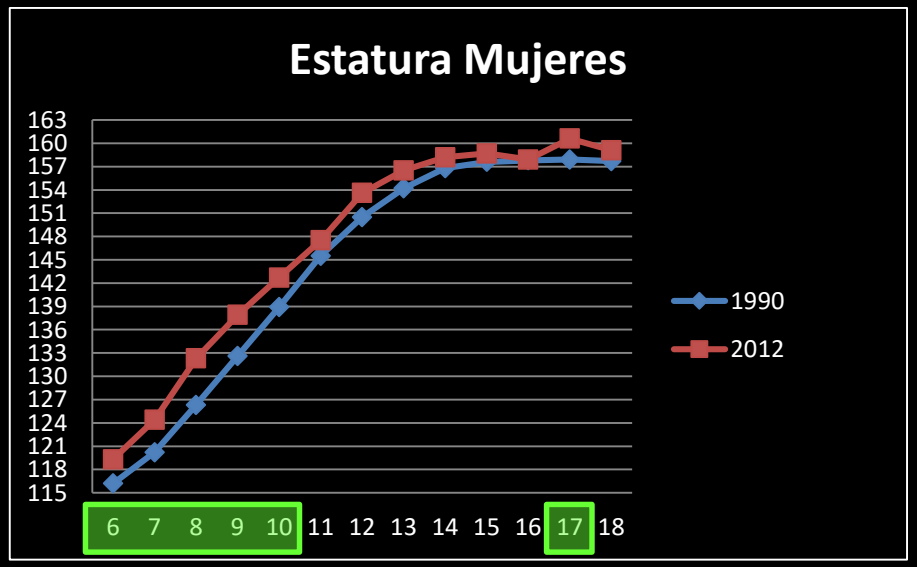
Resultados

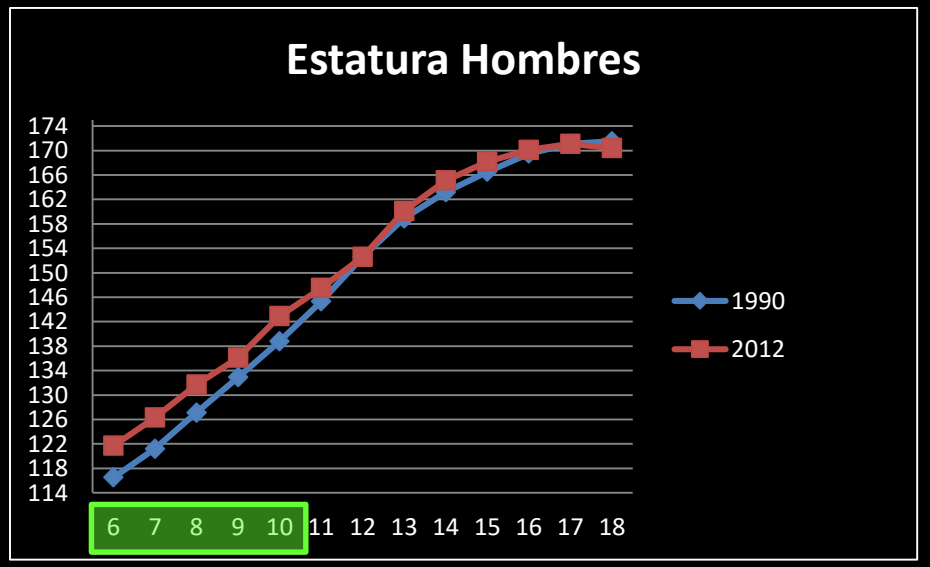
Diferencias Según estratos



Resultados

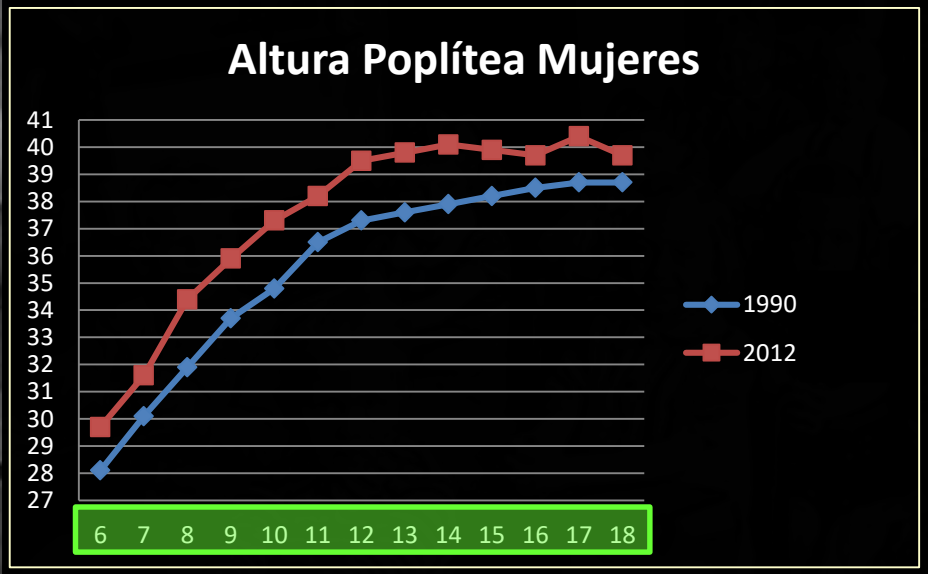
Crecimiento en Chile

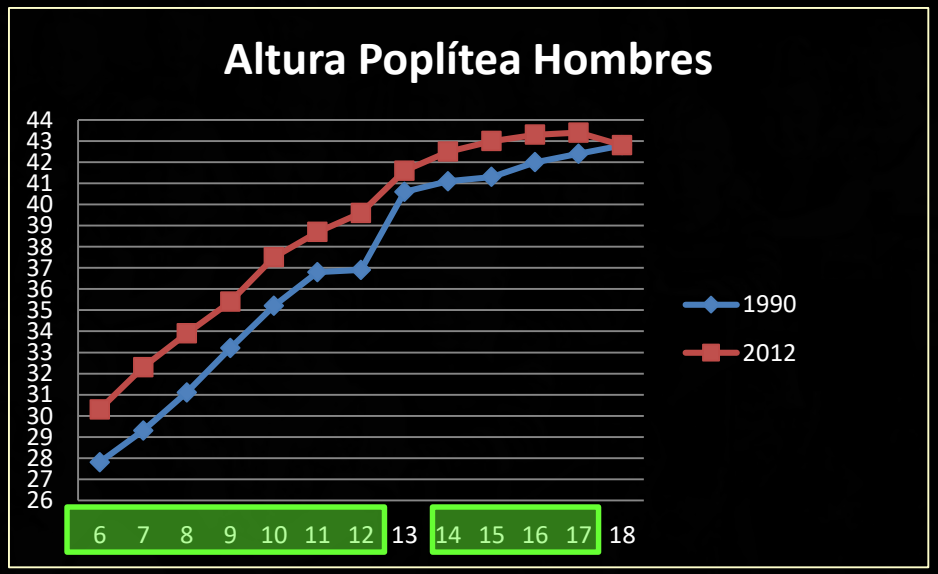




Resultados

Crecimiento en Chile





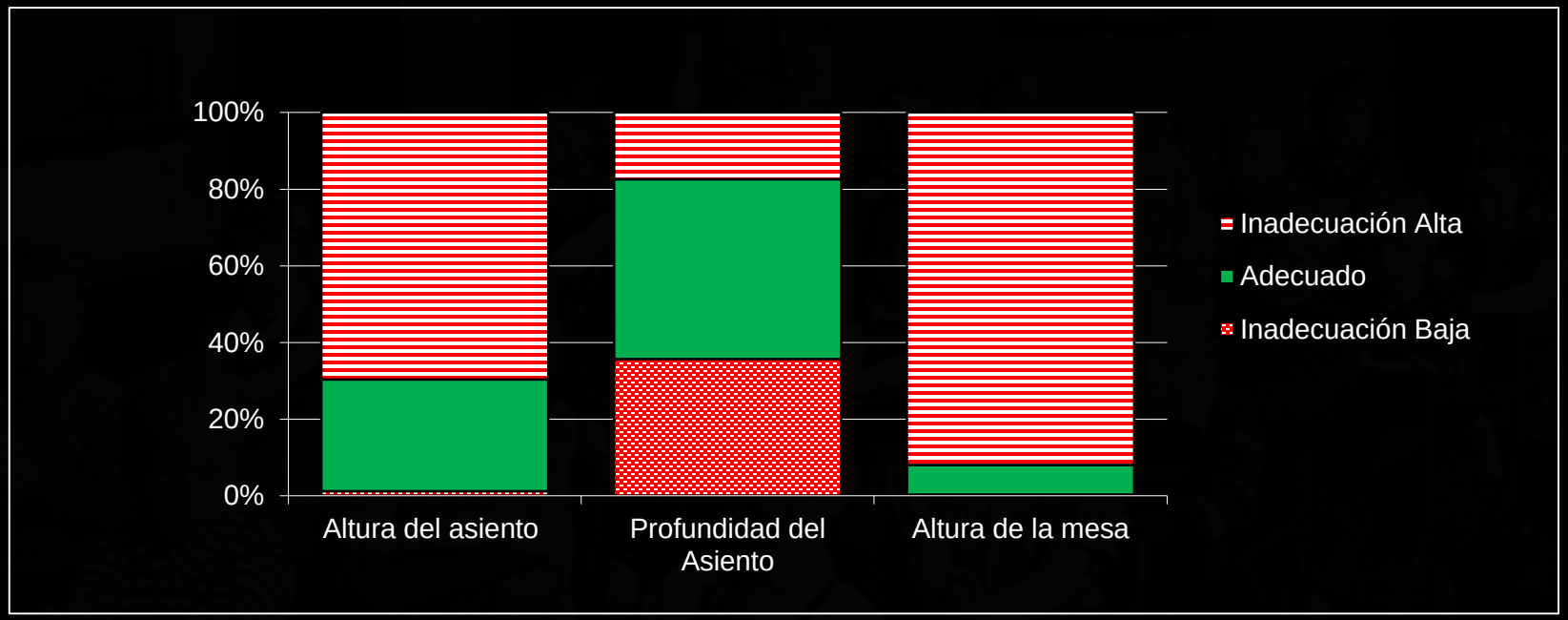
Resultados

Mobiliario Actual

Colegio	Niveles	Grado	AA	ANA	PA	BSR	EBM	AM
A	1	1	39.8	35.5	32.6	32	59.6	67.7
	2	2 y 3	37.1	35.5	31.2	31.5	57	65.1
	3	4 a 8	40.5	36.5	36.5	34.8	57	75.6
B	1	9 a 12	44	38	38	36	59	76
C	1	1 y 2	33	38	38	36	58	63
	2	3 y 4	40	38	38	36	63	70
	3	5 a 12	43	35.5	35.5	38	59.5	74
D	1	1 y 2	38	38	33	32	56	63
	2	3 a 6	41	40	39	37	61	68
	3	7 a 12	45	40	39	37	66	73
E	1	1 y 2	42	35	35	39.5	56	70.5
	2	3 a 8	41.5	35.5	35	39.5	58.5	75.5
F	1	1 a 12	42.8	36	36	35	56.8	74.2
G	1	1	37	35	33	34.7	46.3	63.5
	2	2 a 8	43.5	36	36	36	57	75

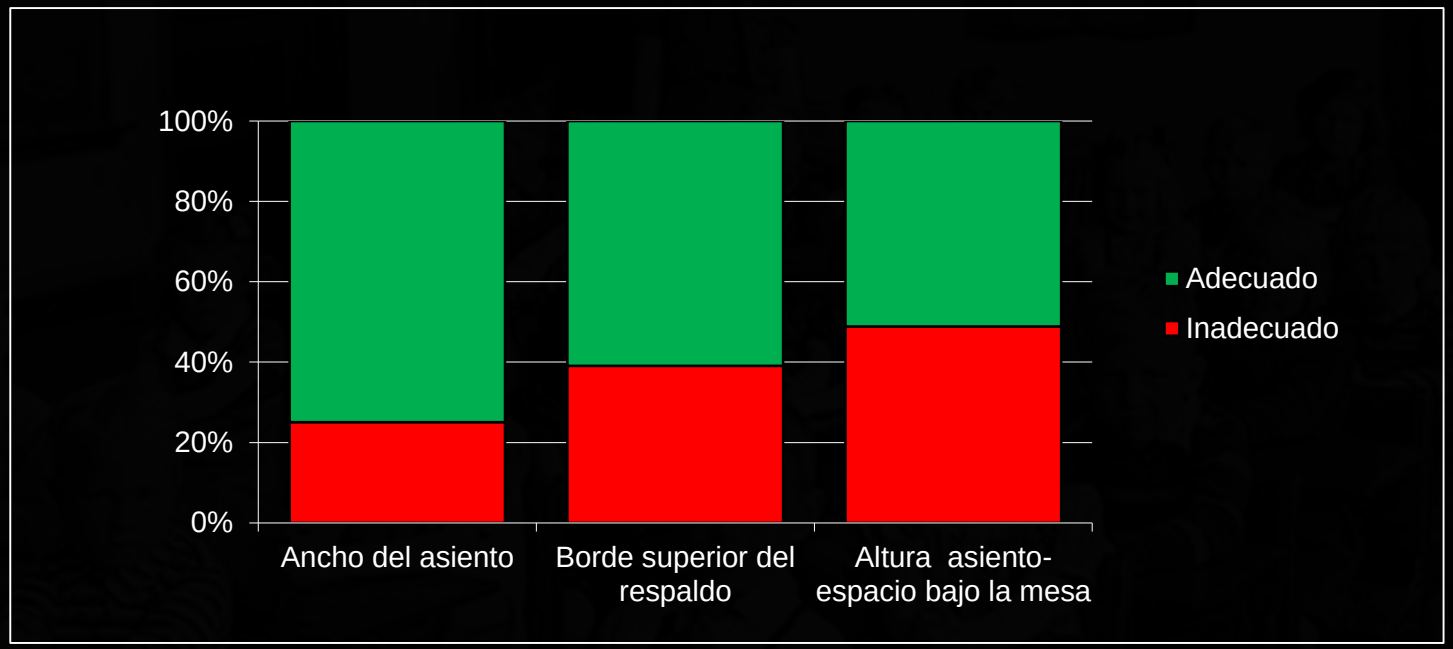
Resultados

Mobiliario Actual



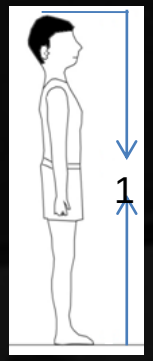
Resultados

Mobiliario Actual



Resultados

Mobiliario de la Nch 2566



Parámetros[1)]	Tamaños de las sillas				
	1	2	3	4	5
Color para la marca de identificación del tamaño	Naranjo	Violeta	Amarillo	Rojo	Verde
Estatura de referencia	110 - 123	124 - 137	138 - 151	152 - 168	169 - 184
Asiento[1)]					
Altura, h_5	30	34	38	41	45

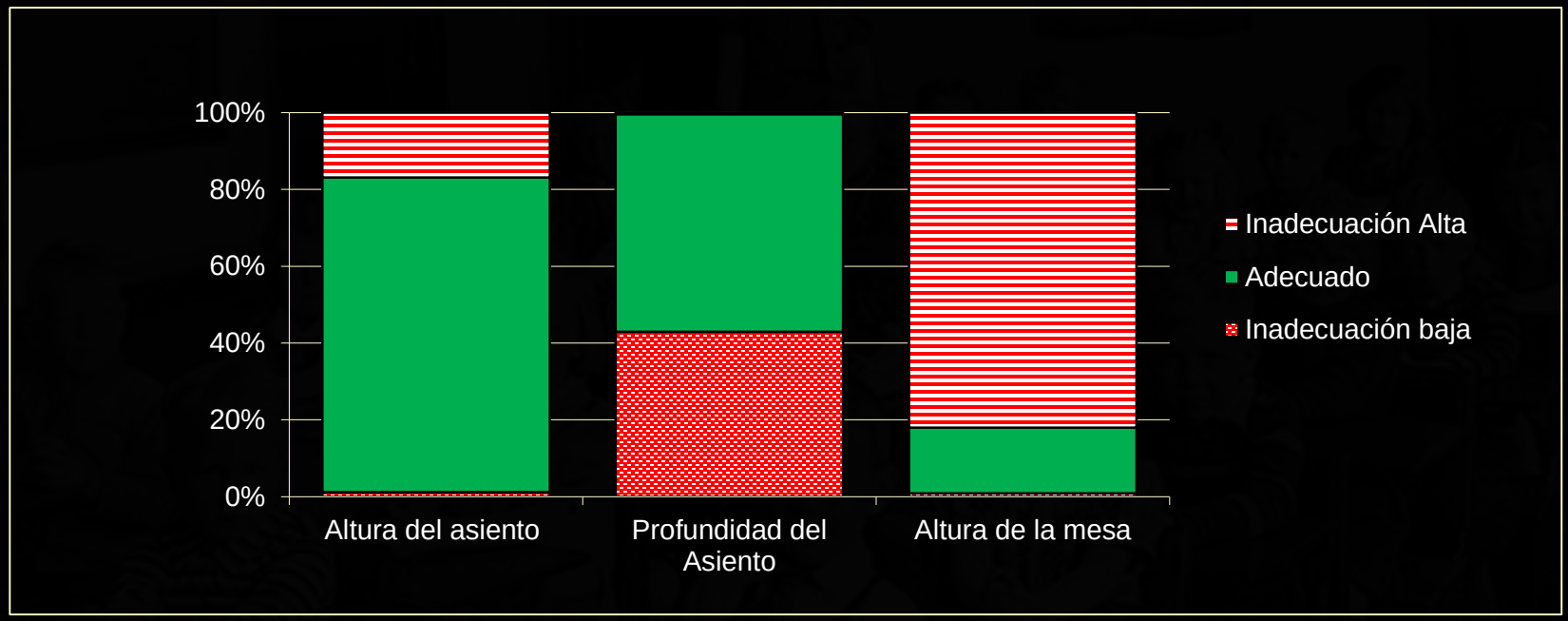
↓

FORMULAS

Adecuado ← → Inadecuado

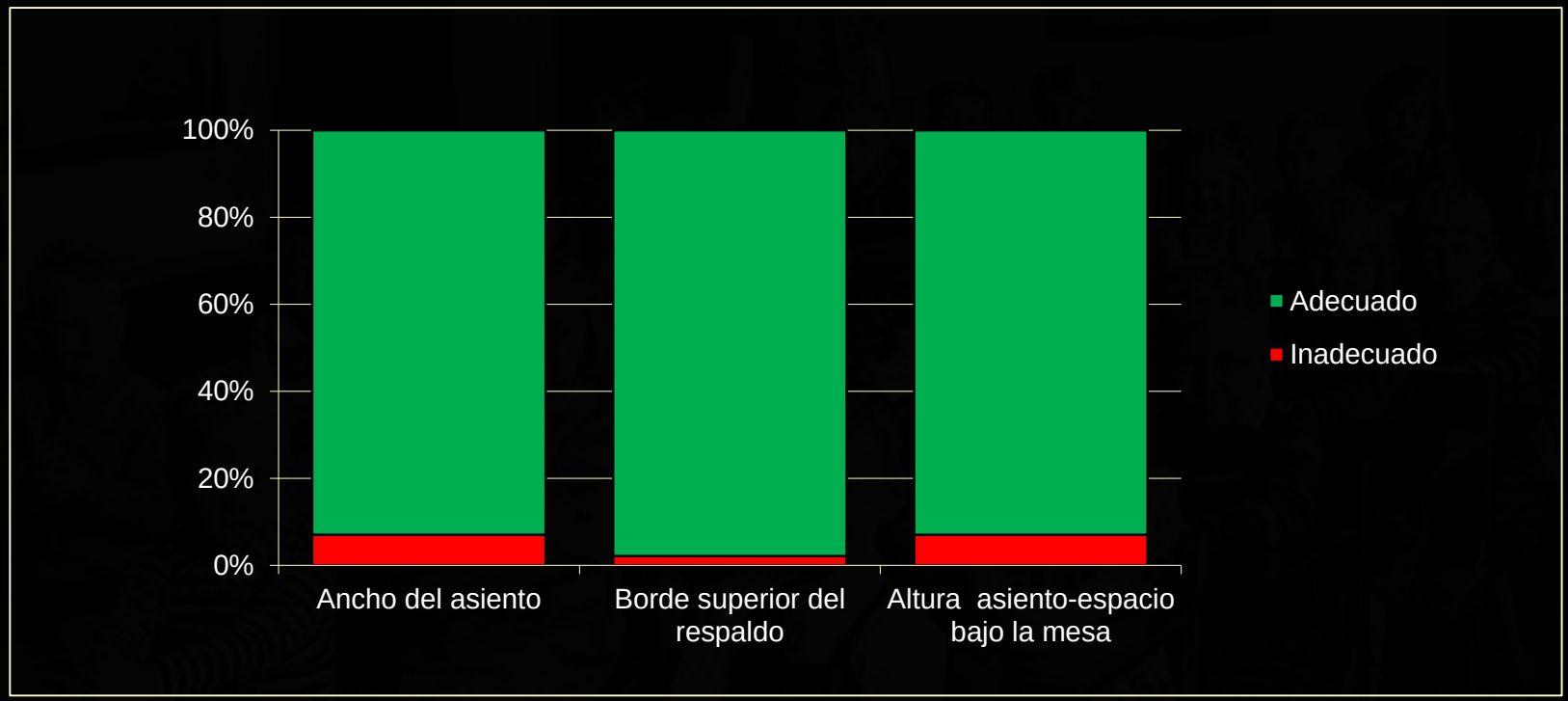
Resultados

Mobiliario de la Nch 2566



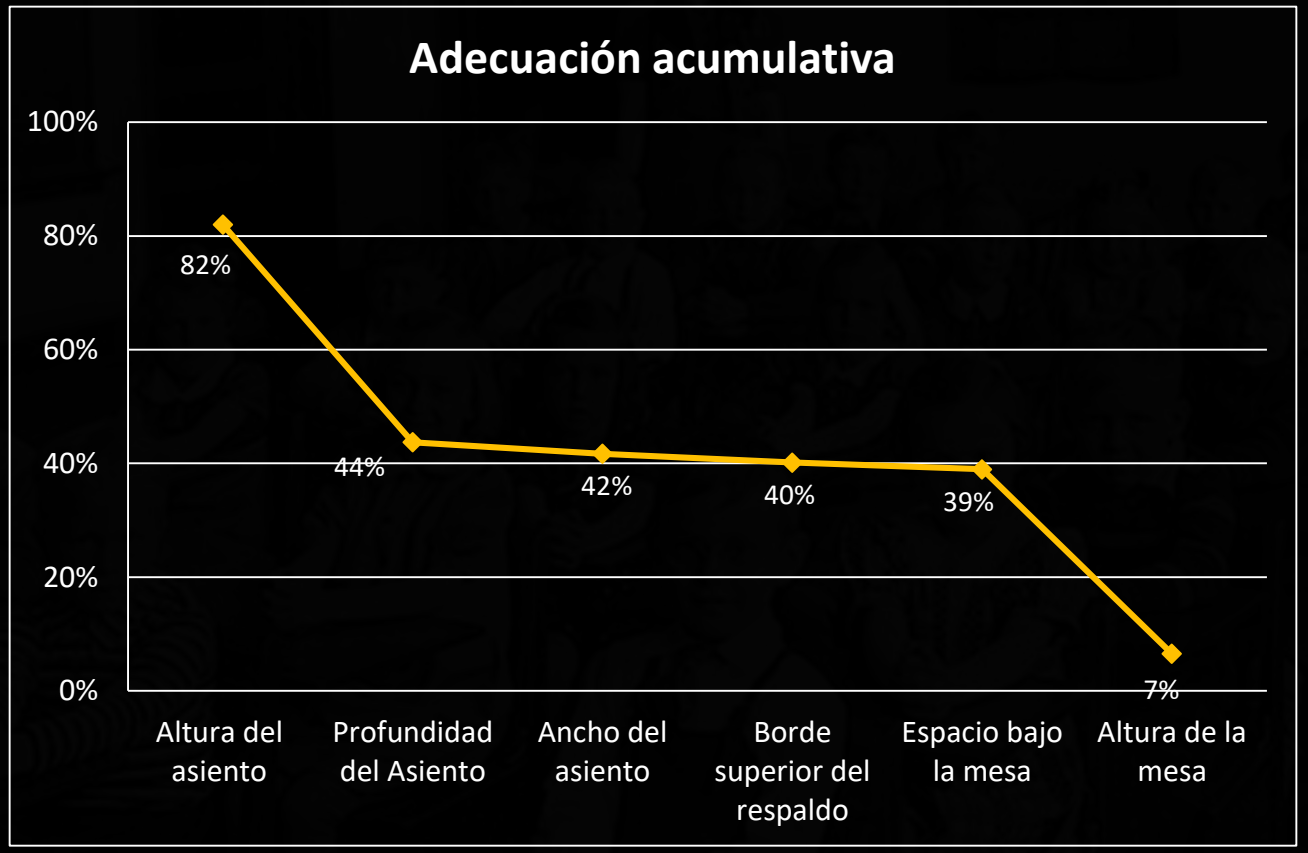
Resultados

Mobiliario de la Nch 2566



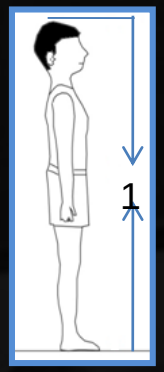
Resultados

Mobiliario de la Nch 2566



Resultados

Estatura V/S Alt. Poplítea



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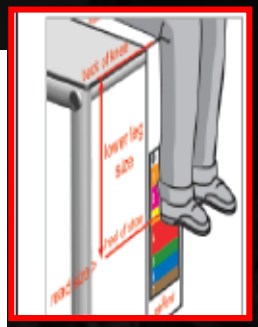
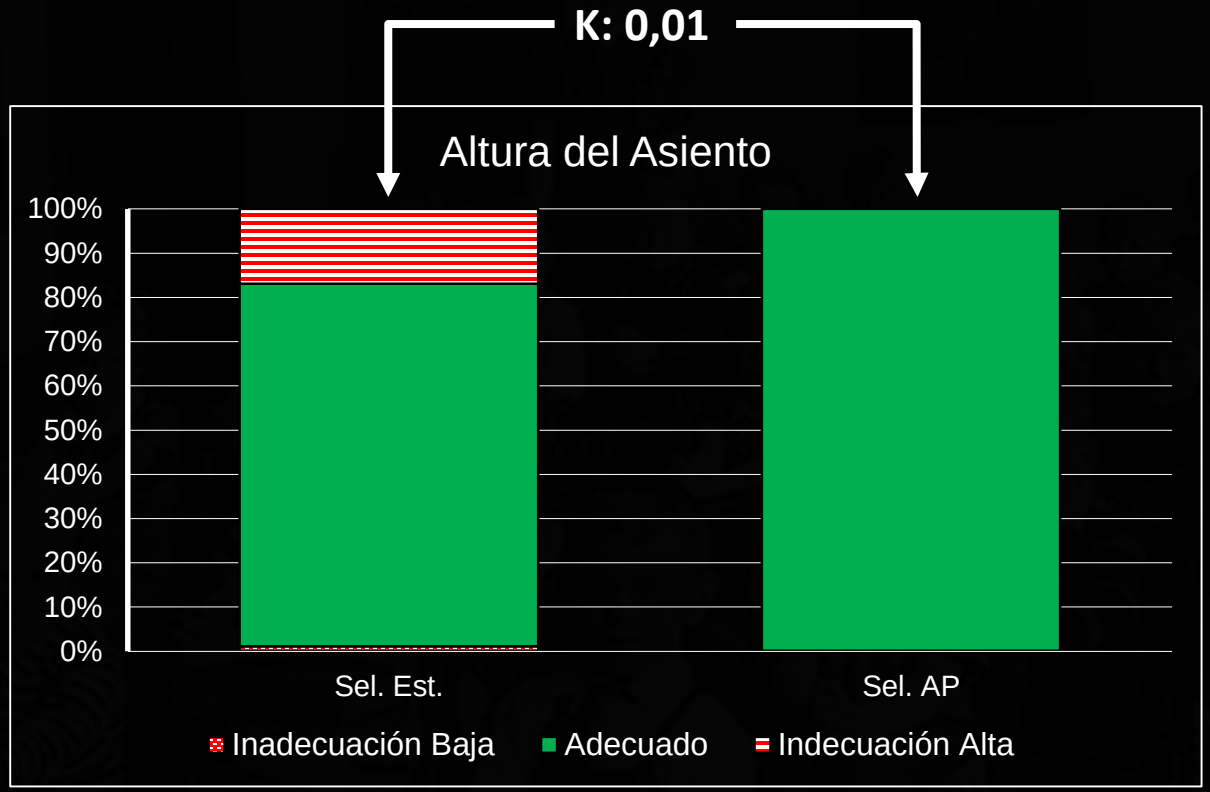


FORMULAS

Adecuado ← → Inadecuado

Resultados

Estatura V/S Alt. Poplítea



Resultados

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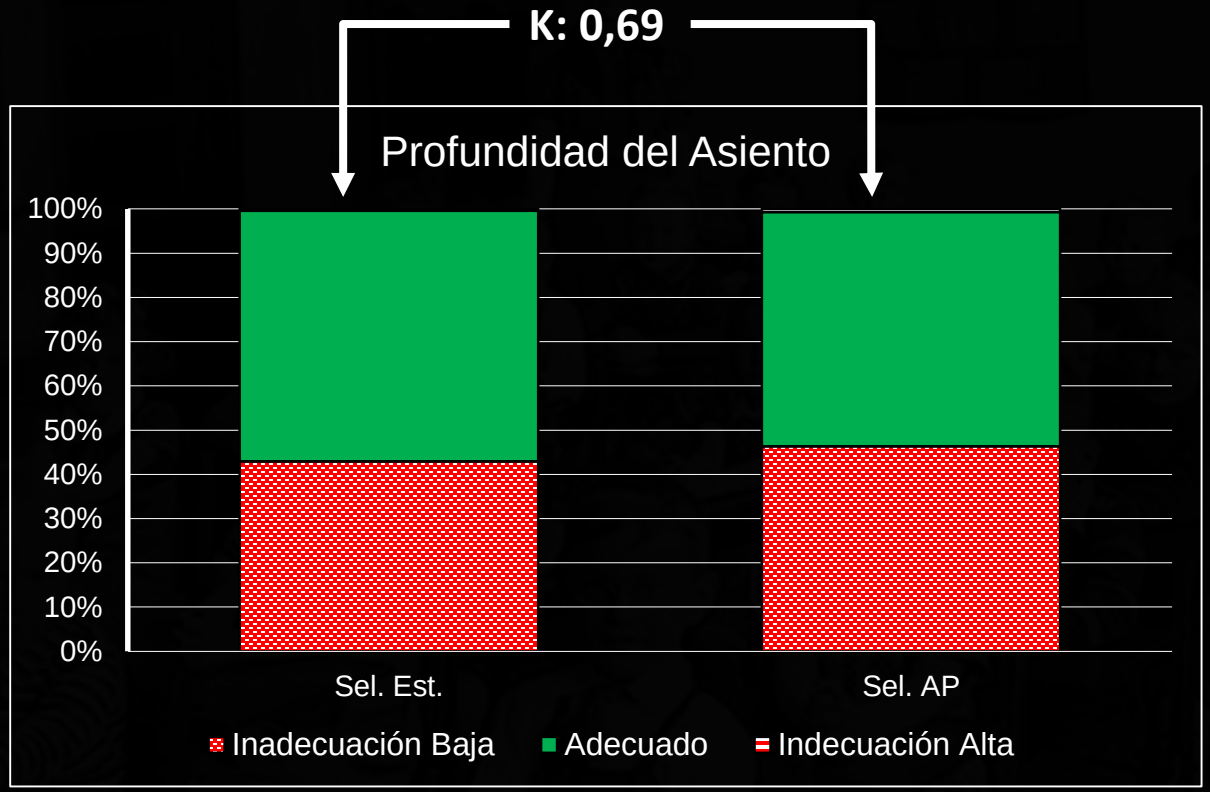
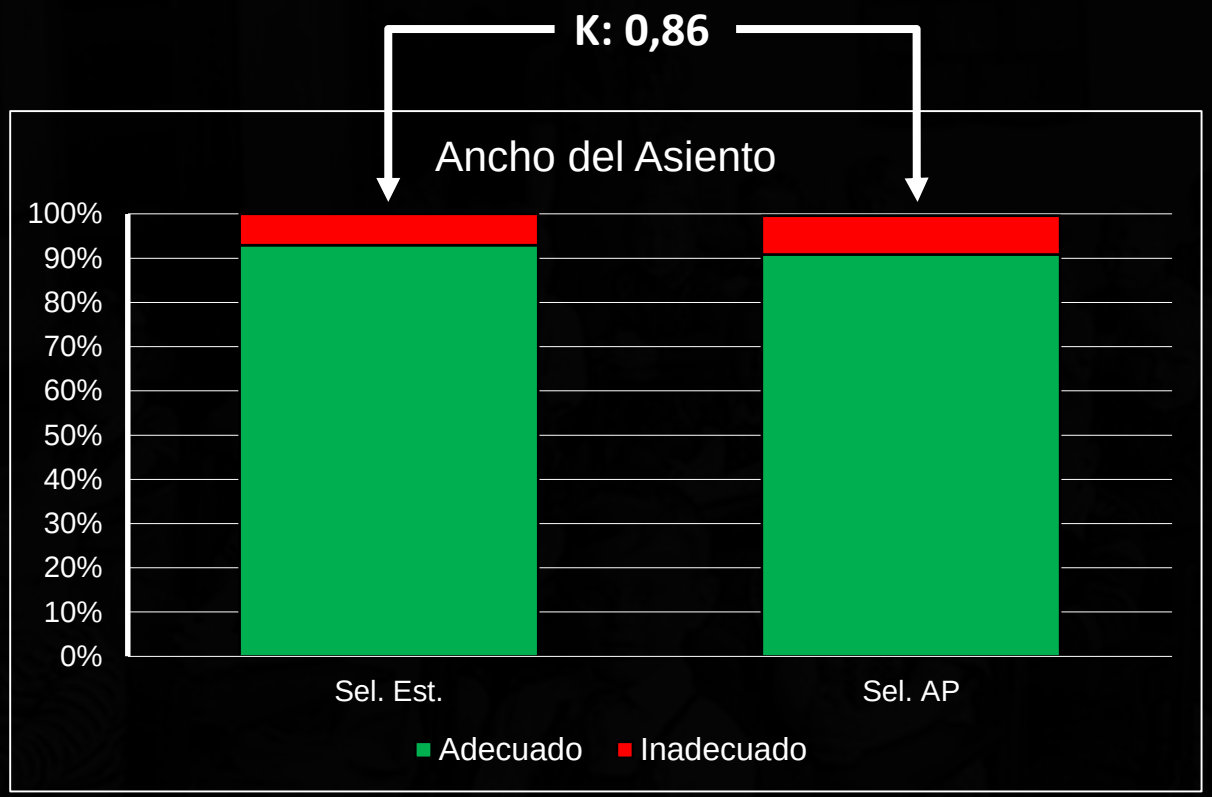


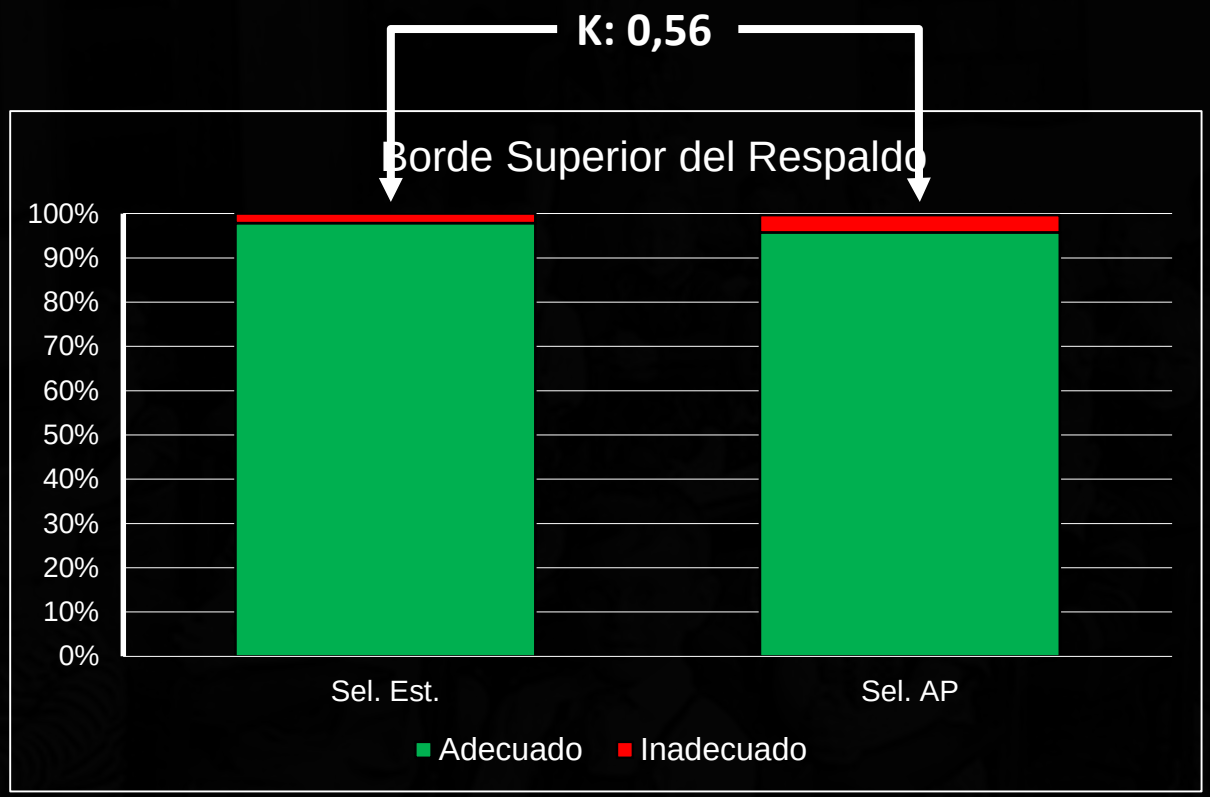
Resultados

Estatura V/S Alt. Poplítea



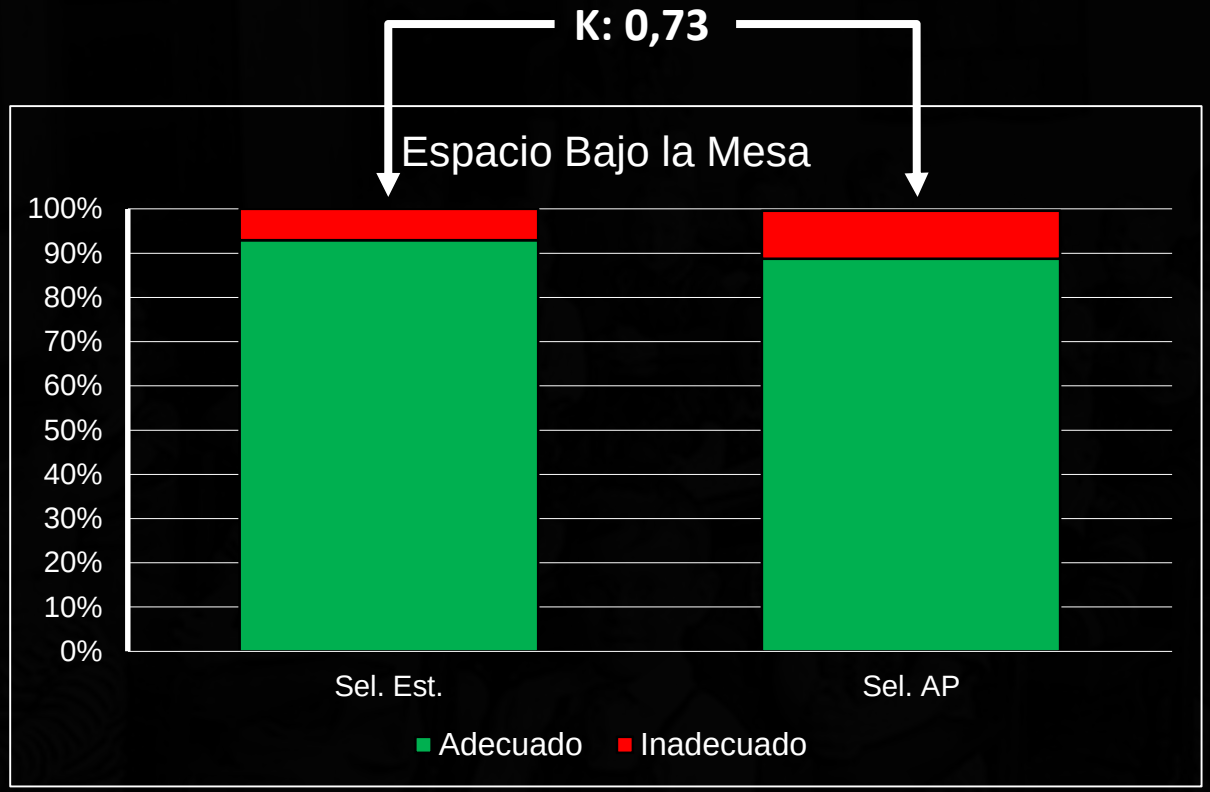
Resultados

Estatura V/S Alt. Poplítea



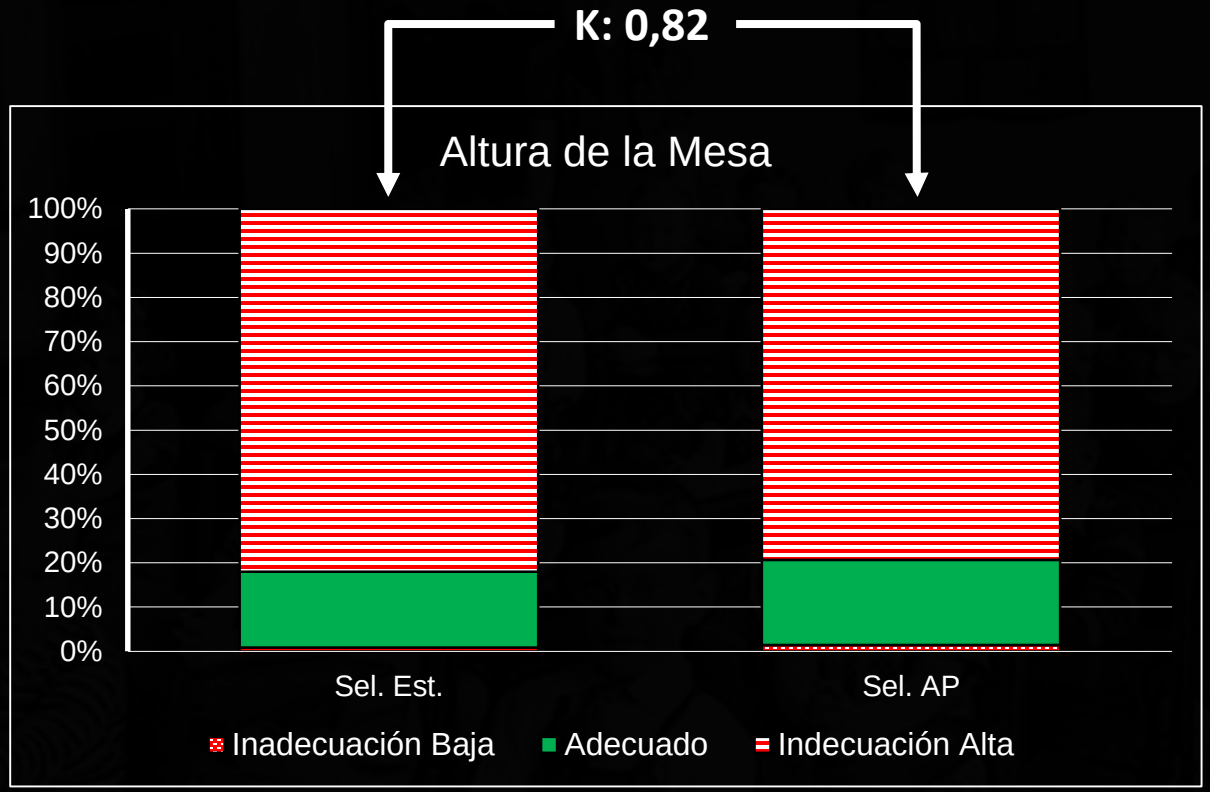
Resultados

Estatura V/S Alt. Poplítea



Resultados

Estatura V/S Alt. Poplítea



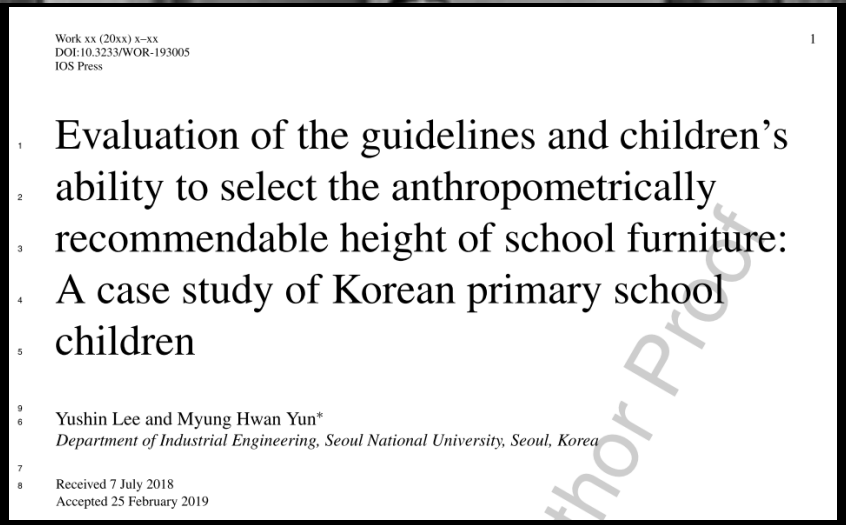
Conclusiones

Resultados

- Se evidencia Crecimiento Secular
- Los muebles actuales no son, en general, los de la NCh 2566. Además, presentan altos niveles de inadecuación.
- Existe altos niveles de inadecuación en los muebles de la Nch 2566: Alt. Asiento, profundidad del asiento y altura de la mesa
- La AP es mejor medida para asignar mobiliario que la Estatura
- Se recomienda modificar el diseño del mobiliario

Conclusiones

Resultados



Work xx (20xx) x–xx
DOI:10.3233/WOR-193005
IOS Press

Evaluation of the guidelines and children's ability to select the anthropometrically recommendable height of school furniture: A case study of Korean primary school children

Yushin Lee and Myung Hwan Yun*
Department of Industrial Engineering, Seoul National University, Seoul, Korea

Received 7 July 2018
Accepted 25 February 2019

Los resultados del estudio 1 revelaron que alrededor de las tres cuartas partes de los niños podrían ser emparejados siguiendo las pautas. Los resultados del estudio 2 mostraron que una cuarta parte de los niños seleccionaron por sí mismos alturas de escritorio y asiento que se podían combinar. Desarrollamos nuevas pautas utilizando algoritmos de clasificación basados en los datos empleados en el estudio 1, y se confirmó que las nuevas pautas podrían aumentar significativamente el grado de coincidencia

¿QUÉ HACEMOS?

Applied Ergonomics 60 (2017) 320–333

Contents lists available at ScienceDirect

Applied Ergonomics

journal homepage: www.elsevier.com/locate/apergo

Review article

A qualitative review of existing national and international occupational safety and health policies relating to occupational sedentary behaviour

Pieter Coenen [a], Nicholas Gilson [b], Genevieve N. Healy [c, d, a], David W. Dunstan [c, d, e, f, g, h, i], Leon M. Straker [a, *]

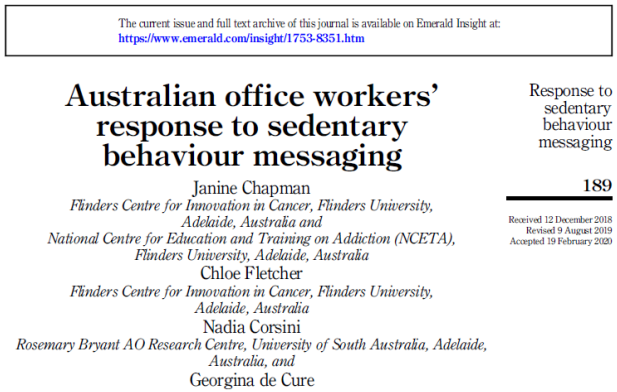
[a] School of Physiotherapy and Exercise Science, Curtin University, Perth, Australia

Table 1 Examples of countries with official sedentary behaviour public health guidelines for adults

Country, year, issuing body	Sedentary behaviour guideline component 1	Sedentary behaviour guideline component 2
Australia, 2014, Department of Health[15]	Minimise the amount of time spent in prolonged sitting*	Break up long periods of sitting as often as possible*
Germany, 2017, German Federal Ministry of Health[18]	Adults and older adults should avoid long periods of sitting†	Adults and older adults should break up sitting time by physical activity whenever possible†
New Zealand, 2015, New Zealand Ministry of Health[16]	Sit less‡	Break up long periods of sitting‡
Norway, 2014, Norwegian Directorate of Health[19]	Sedentary time should be reduced*	Long periods of sedentary behaviour should be interrupted with activity breaks*
UK, 2011, Department of Health/The Four Home Countries' Chief Medical Officers[12]	All adults should minimise the amount of time spent being sedentary (sitting) for extended periods.§	Taking regular breaks at work; breaking up sedentary time such as swapping a long bus or car journey for walking part of the way§

Hay países que tienen políticas públicas

- Los trabajadores son receptivos a los mensajes breves y el mensaje de Riesgo Laboral se mostró prometedor para promover el cambio. Sin embargo, **la exposición sedentaria se considera un problema a nivel organizacional**. Se necesita un enfoque de "todo el lugar de trabajo" con estrategias co-diseñadas y adaptadas a la cultura y las prácticas laborales dentro de la organización.



The current issue and full text archive of this journal is available on Emerald Insight at:
https://www.emerald.com/insight/1753-8351.htm

Australian office workers' response to sedentary behaviour messaging

Janine Chapman
Flinders Centre for Innovation in Cancer, Flinders University, Adelaide, Australia and
National Centre for Education and Training on Addiction (NCETA), Flinders University, Adelaide, Australia
Chloe Fletcher
Flinders Centre for Innovation in Cancer, Flinders University, Adelaide, Australia
Nadia Corsini
Rosemary Bryant AO Research Centre, University of South Australia, Adelaide, Australia, and
Georgina de Cure

Received 12 December 2018
Revised 9 August 2019
Accepted 19 February 2020

Tipos de intervención

Entorno Físico	Individuo	Organización
• Escritorio sentado/parado • Escritorio con cinta de correr o pedalera. • Facilitar área para estar de pie: cafetería, etc • Crea circuitos para caminar	• Programas de modificación de comportamiento • Pausas laborales activas. • Programas de caminata en el trabajo con desafío de podómetros. • Promoción del uso de escalera. • Software de pausas	• Reuniones caminando • Mail activos

Parry et al., 2019

Published in final edited form as:
Med Sci Sports Exerc. 2017 August ; 49(8): 1572–1582. doi:10.1249/MSS.0000000000001257.

Targeting Reductions in Sitting Time to Increase Physical Activity and Improve Health

Sarah K. Keadle[1], David E. Conroy[2,3], Matthew P. Buman[4], David W. Dunstan[5,6,7,8,9,10,11], and Charles E. Matthews[12]

- Estudios observacionales recientes sugieren que aprovechar la relación de tiempo inverso entre los comportamientos sedentarios y activos reemplazando sentarse por estar de pie, una actividad de intensidad ligera o moderada puede tener importantes beneficios para la salud, particularmente entre los adultos menos activos.
- En contraste con las teorías conductuales bien establecidas que guían el desarrollo y la difusión de intervenciones **basadas en evidencia para aumentar la actividad física de intensidad moderada a vigorosa, se sabe mucho menos sobre cómo reducir el tiempo sedentario para aumentar las actividades diarias.**

Dunstan *et al. BMC Public Health* 2013, **13**:1057
http://www.biomedcentral.com/1471-2458/13/1057

BMC Public Health

STUDY PROTOCOL Open Access

Reducing office workers' sitting time: rationale and study design for the *Stand Up Victoria* cluster randomized trial

David W Dunstan[1,2,3,4,5*†], Glen Wiesner[1], Elizabeth G Eakin[2], Maike Neuhaus[3], Neville Owen[1], Anthony D LaMontagne[6], Marj Moodie[7], Elisabeth AH Winkler[2], Brianna S Fjeldsoe[2], Sheleigh Lawler[2] and Genevieve N Healy[1,2,8†]

Original article
Scand J Work Environ Health Online-first -article

doi:10.5271/sjweh.3820

A cluster randomized controlled trial to reduce office workers' sitting time: effect on productivity outcomes

by Peterman JE, Healy GN, Winkler EAH, Moodie M, Eakin EG, Lawler SP, Owen N, Dunstan DW, LaMontagne AD

This study reports the 3- and 12-month effects of the "Stand Up Victoria" multi-component, workplace sitting-reduction intervention on productivity outcomes. Small-to-moderate improvements in some measures of productivity were observed at 12 months. These findings suggest additional benefits of workplace sitting-reduction interventions and strengthen the business case for implementation.

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Refers to the following text of the Journal: 2018;44(5):503-511

La intervención mejoró algunas medidas de productividad a los 12 meses, proporcionando evidencia importante para el caso comercial que respalda las intervenciones de reducción de estar sentado en el lugar de trabajo.

Nguyen et al. International Journal of Behavioral Nutrition and Physical Activity (2020) 17:117
https://doi.org/10.1186/s12966-020-01009-3

International Journal of Behavioral Nutrition and Physical Activity

REVIEW Open Access

The effectiveness of sedentary behaviour interventions on sitting time and screen time in children and adults: an umbrella review of systematic reviews

Phuong Nguyen[1,2*], Long Khanh-Dao Le[1], Dieu Nguyen[1], Lan Gao[1,2,3], David W. Dunstan[4,5] and Marj Moodie[1,2]

Todas las revisiones de intervenciones de comportamiento sedentario en lugares de trabajo de oficina indicaron **una reducción sustancial en el tiempo ocupacional sentado (rango: 39,6 a 100 min por día laboral de 8 h).**

Los análisis de subgrupos informaron una tendencia que favorece los componentes del cambio ambiental, como los escritorios para sentarse y pararse, las estaciones de trabajo activas y permisivas, etc.

Los metaanálisis indicaron que las intervenciones de comportamiento sedentario fueron superiores a las intervenciones de actividad física sola o las intervenciones combinadas de actividad física y comportamiento sedentario para reducir el tiempo de estar sentado .

Review

Environmental, behavioural and multicomponent interventions to reduce adults' sitting time: a systematic review and meta-analysis

Melissa M Peachey, Julie Richardson, Ada V Tang, Vanina Dal-Bello Haas, Janelle Gravesande

- La revisión identificó que las intervenciones para reducir el comportamiento sedentario de los adultos **pueden resultar en una reducción de 30 minutos en el tiempo diario de estar sentado, lo que probablemente sea clínicamente significativo.**
- Los escritorios **para estar de pie son un ingrediente potencialmente importante de intervenciones exitosas de componentes múltiples en entornos de trabajo**, especialmente en entornos de oficina.
- La evidencia de las intervenciones conductuales para reducir el **comportamiento sedentario de los adultos en entornos fuera del lugar de trabajo es limitada**.

Applied Ergonomics 84 (2020) 103027

Contents lists available at ScienceDirect

Applied Ergonomics

journal homepage: http://www.elsevier.com/locate/apergo

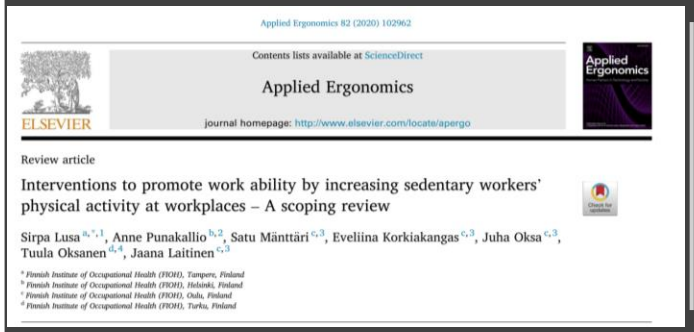
Effectiveness of the multi-component dynamic work intervention to reduce sitting time in office workers – Results from a pragmatic cluster randomised controlled trial

Lidewij R. Renaud [a,*], Judith G.M. Jelsma [a], Maaike A. Huysmans [a], Femke van Nassau [a], Jeroen Lakerveld [b,c,d], Erwin M. Speklé [a,e], Judith E. Bosmans [f], Dominique P.M. Stijnman [g], Anne Loyen [h], Allard J. van der Beek [a], Hidde P. van der Ploeg [a]

[a] Amsterdam UMC, Vrije Universiteit Amsterdam, Department of Public and Occupational Health, Amsterdam Public Health Research Institute, the Netherlands
[b] Department of Epidemiology and Biostatistics, Amsterdam Public Health Research Institute, VU University Medical Center, Amsterdam UMC, the Netherlands
[c] Julius Center for Health Sciences and Primary Care, University Medical Center Utrecht, Utrecht, the Netherlands
[d] Global Geo Health Data Center, Utrecht University, Utrecht, the Netherlands
[e] Arbo Unie, Occupational Health Service, Utrecht, the Netherlands
[f] Department of Health Sciences, Faculty of Science, Vrije Universiteit Amsterdam, Amsterdam Public Health Research Institute, the Netherlands

El tiempo total sentado no difirió entre el grupo de intervención y el grupo de control en el seguimiento de 8 meses. Los resultados secundarios tampoco mostraron diferencias entre el grupo de intervención y el grupo de control.

Este estudio evaluó la efectividad de una intervención en el lugar de trabajo de la vida real para reducir el tiempo de estar sentado y mostró poco o ningún efecto. Esto puede deberse a la intensidad relativamente baja de la intervención, es decir, que solo implicó el reemplazo del 25% de las estaciones de trabajo para sentarse por estaciones de trabajo para sentarse y pararse.



Applied Ergonomics 82 (2020) 102962

Contents lists available at ScienceDirect

Applied Ergonomics

journal homepage: http://www.elsevier.com/locate/apergo

Review article

Interventions to promote work ability by increasing sedentary workers' physical activity at workplaces – A scoping review

Sirpa Lusa [a,*,1], Anne Punakallio [b,2], Satu Mänttäri [c,3], Eveliina Korkiakangas [c,3], Juha Oksa [c,3], Tuula Oksanen [d,4], Jaana Laitinen [c,3]

[a] Finnish Institute of Occupational Health (FIOH), Tampere, Finland
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[d] Finnish Institute of Occupational Health (FIOH), Turku, Finland

- Es posible promover la capacidad para el trabajo (WAI) mediante intervenciones de actividad física.
- Las intervenciones deben ser versátiles y adaptadas a las demandas laborales y a los trabajadores.

Study ID	Country	Year	Study design	N	Intervention	Control	Duration	Follow-up	Work-related outcome
Andersen	Denmark	2012	RCT (cluster)	449	Exercise	Control group	20 w	imm	Work disability
Ben-Ner	USA	2014	RCT	43	Exercise and/or work station	Control group	12 mo	imm	Work performance
Bergouignan	USA	2016	RCT (cross-over)	30	Exercise and/or breaks	Control group	During one day	imm	Mood state, cognitive function
Bernaards	Netherlands	2007	RCT	466	Exercise and/or breaks	Usual care group	6 mo	6 mo	Disability at work
Blangsted	Denmark	2008	RCT	616	Exercise	Comp: informed of general health-promotion	12 mo	imm	Work ability, sick leave
Brakenridge	Australia	2016	CBA (cluster-rand)	153	Exercise and/or work station	Comp: without activity tracker	12 mo	imm	Work performance
Carr	USA	2016	RCT	60	Exercise and/or work station	Comp: without activity permissive work station	16 w	imm	Work productivity
Chopp-Hurley	Canada	2017	RCT	24	Exercise	Control group	12 w	imm	Work ability
Commissaris	Netherlands	2014	Rand repeated measured	15	Exercise and/or work station	Control group	During one day	imm	Work performance
Coulson	UK	2008	RCT (cross-over)	201	Exercise	Comp: No-exercise day	During one day	imm	Work performance
Dalager	Denmark	2015	RCT (cluster)	573	Exercise	Control group	20 w	imm	Work ability and productivity
Dutta	USA	2014	RCT (cross-over)	28	Exercise and/or work station	Control group	4 w	imm	Work productivity
Gibbs	USA	2017	RCT (cross-over)	18	Exercise and/or work station	Control group	Over 4 weeks	imm	Work productivity
(van den) Heuvel	Netherlands	2003	RCT (cluster)	268	Walking and/or breaks	Control group	8 w	imm	Sick leaves, work productivity
Irmak	Turkey	2012	RCT	39	Exercise	Control group	10 w	imm	Work performance
Kaeding	Germany	2017	RCT	41	Exercise	Control group	3 mo	imm	Work ability, sick leaves
Klemetti	Finland	1997	CBA	151	Exercise	Control group	4 w	6 m	Sick leaves
Koren	Slovenia	2016	CBA (cross-	13	Exercise and/or	Control group	During one	imm	Work performance

Barreras

- Este estudio exploró las creencias de los usuarios objetivo y de las partes interesadas clave con respecto a las estrategias para reducir el sedentel centrándose en enfoques apoyados por la tecnología (n:27)
- **La principal barrera para reducir la necesidad de estar sentado fue que las tareas relacionadas con el trabajo tomaran la prioridad principal**.
- Los diseñadores de intervenciones deben considerar las preferencias individuales, los factores ambientales, la cultura crítica, las preocupaciones sobre la productividad y el conocimiento del personal.
- Las estrategias respaldadas por la tecnología, como las aplicaciones para teléfonos inteligentes, el software de computadora, los dispositivos portátiles y los correos electrónicos, se consideraron herramientas útiles para proporcionar indicaciones y permitir el autocontrol del comportamiento de una manera fácilmente individualizada

ORIGINAL ARTICLE

Exploring the Views of Desk-Based Office Workers and Their Employers' Beliefs Regarding Strategies to Reduce Occupational Sitting Time, With an Emphasis on Technology-Supported Approaches

Aoife Stephenson, PhD, Suzanne M. McDonough, PhD, Marie H. Murphy, PhD, Chris D. Nugent, PhD, Iseult M. Wilson, PhD, and Jacqueline L. Mair, PhD

TABLE 3. Participant Suggested Technology-Supported Strategies, Examples, and Considerations

Technology-Supported Strategies	Examples	Considerations
Digital reminders and Prompts • To draw attention to the behavior	• Alarms • Apps • Vibrations • Emails • Computer alerts • PC "lock outs"	• May be ignored • May be used sporadically or not used after novelty wears off • Prompts may become distractions/annoyance/stressful • Frequency and timing of prompts • Unprofessional
Sitting time/activity monitoring • To allow users to self-monitor their sitting/activity • To set goals to reduce sitting time • To allow users to receive personalized feedback on their sitting/activity • To allow competition	• Wearable devices, for example, Fitbit/Apple watch • Pedometers • Apps • Stairs counters	• May be used sporadically or not used after novelty wears off • Wearables currently "trendy" • Wearables can be costly • Devices need to be quick and easy to use • Require minimal interaction • Can become demotivating if not meeting-guilt onset • Feedback can come across as patronizing • People can become obsessed with tracking behaviors • Accuracy of data • Unprofessional • Don't want to wear or carry device

Barreras

Hadgraft et al. International Journal of Behavioral Nutrition and Physical Activity (2018) 15:90
https://doi.org/10.1186/s12966-018-0718-9

International Journal of Behavioral Nutrition and Physical Activity

RESEARCH Open Access

Perceptions of the acceptability and feasibility of reducing occupational sitting: review and thematic synthesis

Nyssa T. Hadgraft[1,2,3], Charlotte L. Brakenridge[3,4], David W. Dunstan[2,3,5,6,7,8], Neville Owen[1,2,3,5,9], Genevieve N. Healy[3,2,10] and Sheleigh P. Lawler[3*]

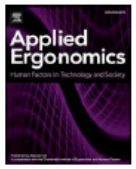
- Identificar y sintetizar la evidencia sobre los **factores que se percibe que influyen en la aceptabilidad y viabilidad de la reducción de estar sentado en el trabajo, sin y con un componente de intervención asociado**
- **RSL hasta Octubre del 2017, 32 estudios** cumplieron con los criterios de inclusión
- Los atributos del **entorno laboral y social se identificaron como barreras/facilitadores**, con el trabajo de escritorio **y las presiones laborales que influyen en la factibilidad percibida de reducir el estar sentado, en particular para las intervenciones de bajo costo**. El apoyo de **compañeros de trabajo y gerentes se consideró un facilitador clave para reducir la necesidad de estar sentado, mientras que las normas sociales que desalentaban el movimiento eran una barrera importante**. En todos los estudios, se identificaron algunas percepciones consistentes de los beneficios de reducir el tiempo sentado, incluida una mejor salud física, y un mayor bienestar emocional.

Applied Ergonomics 78 (2019) 37–53

Contents lists available at ScienceDirect

Applied Ergonomics

journal homepage: www.elsevier.com/locate/apergo



Review article

The effect of sit-stand desks on office worker behavioral and health outcomes: A scoping review

April J. Chambers[a,*], Michelle M. Robertson[b,c], Nancy A. Baker[d]

[a] Department of Bioengineering, University of Pittsburgh, Pittsburgh, PA, 15261, USA
[b] Department of Psychological Sciences, Center for the Promotion of Health in the New England Workplace, University of Connecticut, Storrs, CT, 06103, USA
[c] Office Ergonomics Research Committee, Framingham, MA, 01702, USA
[d] Department of Occupational Therapy, Tufts University, Medford, MA, 02155, USA

- seis dominios: comportamiento (por ejemplo, tiempo sentado y de pie), fisiológico, desempeño laboral, psicológico, malestar y postura. Se incluyeron 53 artículos
- 61% comportamiento, 37% fisiológico, 7% rendimiento laboral, 31% psicológico, 43% malestar, 18% postura fueron significativos.
- Los escritorios para sentarse y pararse cambian efectivamente los comportamientos y la incomodidad, pero estos cambios solo afectan levemente los resultados de salud.

International Journal of Industrial Ergonomics 78 (2020) 102983

Contents lists available at ScienceDirect

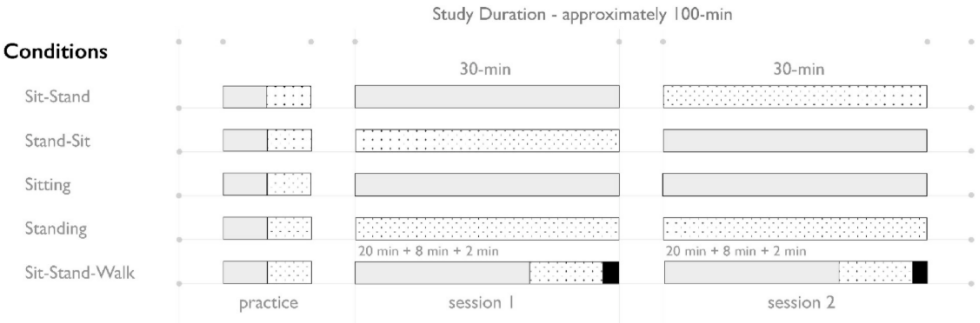
International Journal of Industrial Ergonomics

journal homepage: http://www.elsevier.com/locate/ergon

Effects of a sit-stand-walk intervention on musculoskeletal discomfort, productivity, and perceived physical and mental fatigue, for computer-based work

Gourab Kar *, Alan Hedge

Department of Design & Environmental Analysis, Cornell University, Ithaca, NY, 14853, USA



Para la intervención de **sentarse-pararse-caminar,** el malestar musculoesquelético fue significativamente menor en comparación con estar sentado o de pie durante una hora; la fatiga física percibida fue significativamente menor en comparación con estar de pie durante una hora. **No hubo beneficios ni diferencias entre las condiciones de trabajo en términos de fatiga mental percibida y productividad.**

Al combinar la variabilidad postural de las estaciones de trabajo para sentarse y pararse con la actividad física intermitente de intensidad ligera habilitada por descansos activos, **la intervención para sentarse-pararse y caminar** demuestra una alternativa beneficiosa y viable al trabajo de oficina sedentario.

Medicine & Science IN Sports & Exercise
The Official Journal of the American College of Sports Medicine
www.acsm-msse.org

. . . Published ahead of Print

The Energy Cost of Sitting versus Standing Naturally in Man

James A. Betts[1], Harry A. Smith[1], Drusus A. Johnson-Bonson[1], Tom I. Ellis[1], Joseph Dagnall[1], Aaron Hengist[1], Harriet Carroll[1], Dylan Thompson[1], Javier T. Gonzalez[1], and Gregg H. Afman[2]

[1]Department for Health, University of Bath, Bath, United Kingdom
[2]Department of Kinesiology, Westmont College, CA

La diferencia del 12% entre estar sentado y de pie no representa una estrategia eficaz para el tratamiento de la obesidad (es decir, la pérdida de peso), pero podría atenuar potencialmente cualquier escalada continua de la epidemia de obesidad en curso a nivel de población.

Energy Expenditure of Standing Compared to Sitting While Conducting Office Tasks

Jill Burns, **Cuisle Forde**, and **Sara Dockrell**, Trinity College, Dublin, Ireland

A pesar de los posibles beneficios del movimiento que pueden ocurrir naturalmente, este estudio confirmó que estar de pie en lugar de sentarse no produce un aumento clínicamente importante en el gasto de energía. (<1.5 METs)

Contents lists available at ScienceDirect

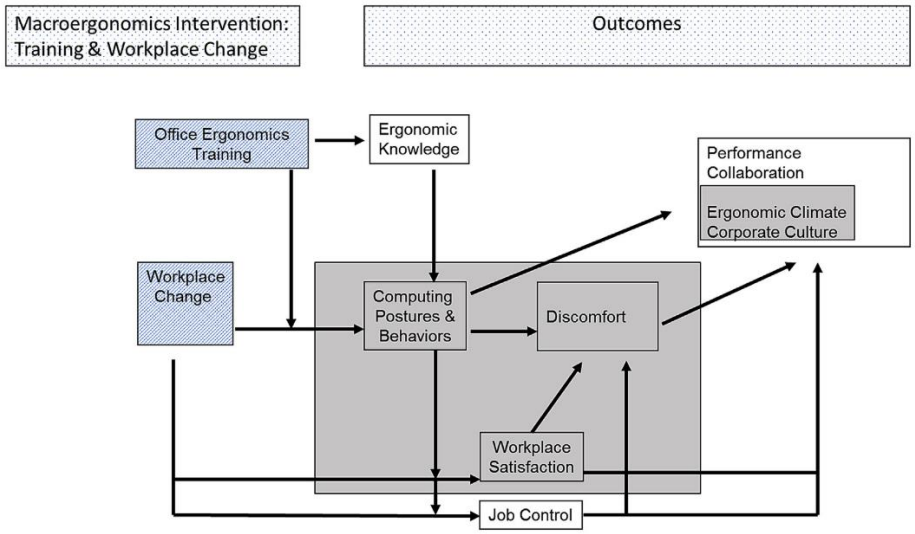
Applied Ergonomics

journal homepage: www.elsevier.com/locate/apergo

Improvements in musculoskeletal health and computing behaviors: Effects of a macroergonomics office workplace and training intervention

Michelle M. Robertson, PhD, MS *, Yueng Hsiang Huang, PhD, Jin Lee, PhD

Liberty Mutual Research Institute for Safety, Hopkinton, MA, United States

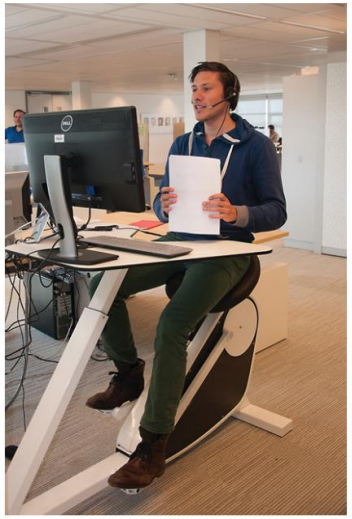


- El Oxidesk fue bien aceptado, se percibió positivamente por su condición física y los participantes mantuvieron su desempeño laboral.
- La actividad física fue más baja que el nivel de actividad requerido en las directrices holandesas para una actividad física suficiente.

Work 54 (2016) 773–778
DOI:10.3233/WOR-162348
IOS Press

Effects of dynamic workstation Oxidesk on acceptance, physical activity, mental fitness and work performance

L. Groenesteijn[a,b,*], D.A.C.M. Commissaris[c], M. Van den Berg-Zwetsloot[d] and S. Hiemstra-Van Mastrigt[a,e]



Applied Ergonomics 45 (2014) 1570–1578

Contents lists available at ScienceDirect

Applied Ergonomics

journal homepage: www.elsevier.com/locate/apergo

Effects of a standing and three dynamic workstations on computer task performance and cognitive function tests

Dianne A.C.M. Commissaris [a], Reinier Könemann [a], Suzanne Hiemstra-van Mastrigt [a], Eva-Maria Burford [b], Juliane Botter [b], Marjolein Douwes [a, *], Rolf P. Ellegast [b]

[a] TNO Work and Employment, Schiphollweg 77-89, Hoofddorp, 2316 ZL Leiden, The Netherlands
[b] Institute for Occupational Safety and Health of the German Social Accident Insurance, Sankt Augustin, Germany

- Se midieron tanto el desempeño laboral objetivo como el percibido.
- Con la **excepción de las tareas de alta precisión con mouse, el rendimiento del trabajo a corto plazo no se vio afectado por trabajar en una estación de trabajo dinámica o de pie.**
- **La percepción del participante de un rendimiento disminuido podría** complicar la aceptación de las estaciones de trabajo dinámicas, aunque la mayoría de los participantes indican que usarían una estación de trabajo dinámica si estuviera disponible en el lugar de trabajo

International Journal of
Environmental Research and Public Health

MDPI

Article

Introducing a Dynamic Workstation in the Office: Insights in Characteristics of Use and Short-Term Changes of Well-Being in a 12 Week Observational Study

Vera Schellewald [1,2,*], Jens Kleinert [2] and Rolf Ellegast [1]

[1] Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA), Alte Heerstr. 111, 53757 Sankt Augustin, Germany; Rolf.Ellegast@dguv.de
[2] Institute of Psychology, German Sport University Cologne, Am Sportpark Müngersdorf 6, 50933 Köln, Germany; kleinert@dshs-koeln.de
* Correspondence: vera.schellewald@dguv.de; Tel.: +49-30-13001-3004

- En un entorno de oficina de la vida real durante un período de 12 semanas, 36 empleados tuvieron acceso gratuito a ocho dispositivos (pedalera). La frecuencia, duración y velocidad de uso fueron autodeterminadas pero registradas objetivamente para cada evento de uso.
- Inmediatamente antes y después de usar un dispositivo de ciclismo, los empleados calificaron su bienestar con una versión modificada de la escala EZ de Nitsch para evaluar los cambios a corto plazo.
- El uso de dispositivos de ciclismo en la oficina podría mejorar el bienestar a corto plazo.

Total Worker Health Intervention Increases Activity of Sedentary Workers

Lucas J. Carr, PhD,[1] Christoph Leonhard, PhD,[2] Sharon Tucker, RN, PhD,[3]
Nathan Fethke, PhD,[4] Roberto Benzo, BS,[1] Fred Gerr, MD[4]

A

B

C

D

ERGONOMICS
2019, VOL. 62, NO. 9, 1227–1233
https://doi.org/10.1080/00140139.2019.1633476

Taylor & Francis
Taylor & Francis Group

ARTICLE

Cardiovascular and metabolic responses of active sitting while performing work-related tasks

Ronald L. Snarr, Emily L. Langford, Greg A. Ryan and Sydni Wilhoite

	Reading			Typing		
	Mean ± SD	*p* Value, effect size		Mean ± SD	*p* Value, effect size	
	HR	v. SB	v. ST	HR	v. SB	v. ST
SC	75 ± 12	.18, 0.08	<.001, 0.31	78 ± 14	.22, 0.04	<.01, 0.15
SB	73 ± 12	–	<.001, 0.38	77 ± 13	–	<.01, 0.18
ST	84 ± 15	–	–	82 ± 14	–	–
	$kcal_{min}$			$kcal_{min}$		
SC	1.64 ± 0.28	.23, 0.09	<.001, 0.71	1.85 ± 0.36	1.0, 0.05	<.01 0.39
SB	1.69 ± 0.26	–	<.001, 0.70	1.81 ± 0.39	–	<.01, 0.42
ST	2.73 ± 0.71	–	–	2.27 ± 0.59	–	–
	METs			METs		
SC	1.44 ± 0.28	.21, 0.1	<.001, 0.75	1.59 ± 0.28	1.0, 0.02	<.01, 0.45
SB	1.50 ± 0.33	–	<.001, 0.71	1.60 ± 0.26	–	<0.01, 0.45
ST	2.35 ± 0.49	–	–	1.94 ± 0.40	–	–

HR: heart rate; $kcal_{mi}$: kilocalories expended per minute; METs: metabolic equivalent task; SC: standard chair; SB: stability ball; ST: active balanced chair.

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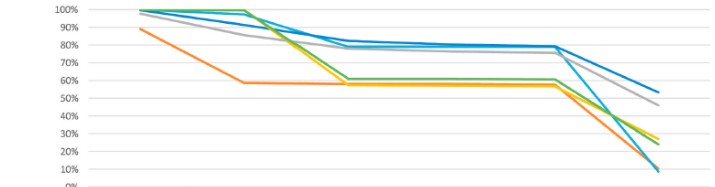
journal homepage: http://www.elsevier.com/locate/apergo

Application of mismatch equations in dynamic seating designs

Héctor Ignacio Castellucci [a, *], Carlos Viviani [b], Pedro Arezes [c], Johan F.M. Molenbroek [d], Marta Martínez [e], Verónica Aparici [f]

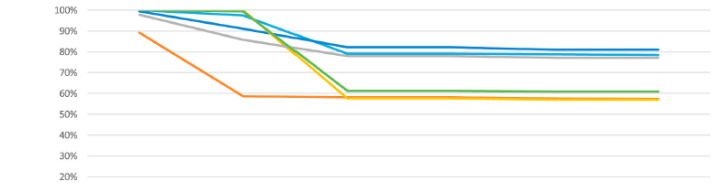
Fig. 1. Hybrid sitting postures. a) Traditional sitting with 90° trunk/thigh angle; b) perching with 105° trunk/thigh angle; c) perching with 120° trunk/thigh angle; d) perching with 135° trunk/thigh angle; and e) standing.

a



	Seat Height	Seat Width	Seat Depth	Seat to Desk Clearance	Legroom Depth	Desk height
Female CEN	89%	59%	58%	58%	58%	10%
Female ISP	100%	97%	79%	79%	79%	9%
Male CEN	99%	91%	82%	80%	79%	53%
Male ISP	100%	100%	57%	57%	57%	27%
TOTAL CEN	98%	86%	78%	76%	76%	46%
TOTAL ISP	100%	99%	61%	61%	61%	24%

b



	Seat Height	Seat Width	Seat Depth	Seat to Desk Clearance	Legroom Depth	Desk height
Female CEN	89%	59%	58%	58%	58%	57%
Female ISP	100%	97%	79%	79%	79%	79%
Male CEN	99%	91%	82%	82%	81%	81%
Male ISP	100%	100%	57%	57%	57%	57%
TOTAL CEN	98%	86%	78%	78%	77%	77%
TOTAL ISP	100%	99%	61%	61%	61%	61%

Fig. 5. Cumulative mismatch with CEN and ISP standards, by gender and total sample a) adjustable chair and fixed desk; and b) adjustable height chair and desk.

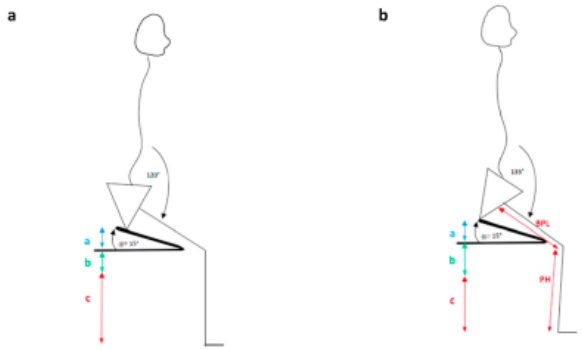


Fig. 2. Comparison of perching postures with slope and height. a) CEN (2015) standard; b) proposed forward slope alternative. PH: Popliteal height. BPL: Buttock-Popliteal length.

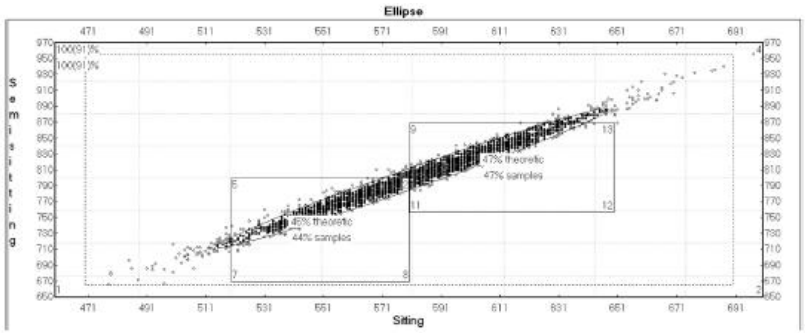


Fig. 6. Seat proposal for sitting and perching. Sitting at 105° and 135° trunk/thigh angle. Axes units in mm.

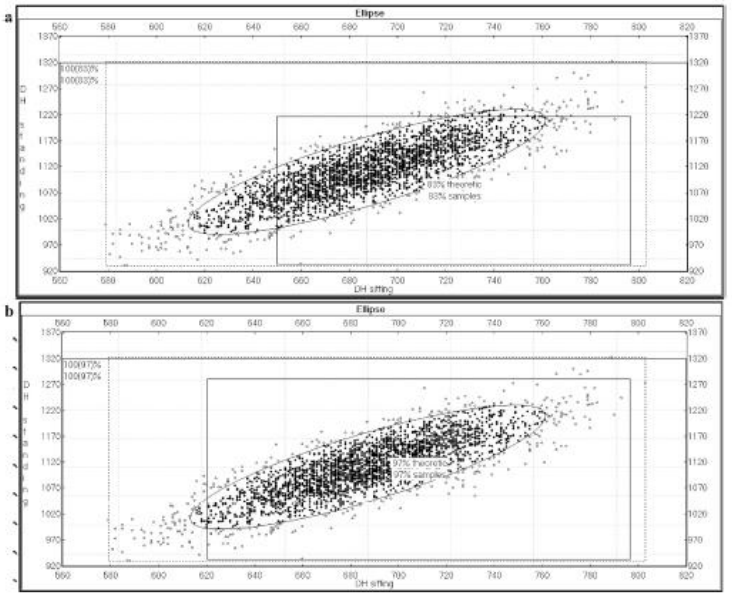


Fig. 7. Adjustable desk height (DH) levels and standing match a. CEN (2011) standard levels of match; b. Commercially available E-model® height adjustable desk. Axes units in mm.

Review

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Effectiveness of workplace interventions in the prevention of upper extremity musculoskeletal disorders and symptoms: an update of the evidence

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Level of evidence (direction of effect)*	Intervention (number of studies)†	Message
Strong (positive)	▶ Resistance training (7)	Implementing a workplace-based resistance training exercise programme, policy or practice can help manage and prevent UEMSD symptoms and disabilities
Moderate (positive)	▶ Stretching exercise programmes (includes UE component) (6) ▶ Vibration feedback on static mouse use (3) ▶ Forearm supports (workstation) (3)	Consider implementing in practices if applicable to the work context
Moderate (no effect)	▶ Job stress management training (UE outcomes) (2) ▶ Biofeedback (EMG) training (5) ▶ Workstation adjustment alone (minimal worker engagement) (5)	Seek alternative interventions based on OHS experience/knowledge
Limited (positive)	▶ Aerobic exercise programmes (3) ▶ Alternative keyboard (force profile) (1) ▶ Trackball pointing device (+/− arm supports) (1) ▶ Rest breaks (5) ▶ Postural exercise programme (1) ▶ Specialised exercise program (Feldenkrais) (1) ▶ Curved seat pan chair (non-office) (1) ▶ Lighter/wider dental tools (1) ▶ Neuromuscular exercise (non-office) (1)	Not enough evidence from the scientific literature to guide current policies/practices
Limited (no effect)	▶ Work redesign to minimise shoulder load (non-office) (4) ▶ Joystick pointing device (+/− arm supports) (1) ▶ Neck school programme (1) individualised exercise programme (+/− stress management) (1)	Not enough evidence from the scientific literature to guide current policies/practices
Mixed	▶ Ergonomics training+workstation adjustment (8) ▶ Low-intensity participatory ergonomics (PE) programmes (4) ▶ Cognitive behavioural training programme (2) ▶ Ergonomics training (2)	Not enough evidence from the scientific literature to guide current policies/practices
Insufficient	▶ Rest breaks plus exercise (1) ▶ Reduced hours (1) ▶ Alternative keyboard (split) (1) ▶ Individual interventions (office) (1) ▶ Patient handling programme (1) ▶ OHS training (2–3 h) and/or ergonomic advice/change and/pr exercise and/or medical examination (1)	Not enough evidence from the scientific literature to guide current policies/practices

*No studies reported a negative effect.
†Studies may appear in multiple intervention categories if they have different intervention arms.
OHS, Occupational Health and Safety; UEMSD, upper extremity musculoskeletal disorders.

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Typing performance and body discomfort among overweight and obese office workers: A pilot study of keyboard modification

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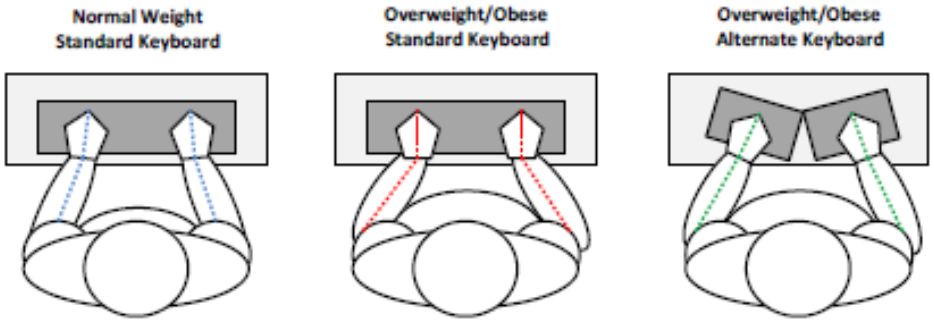

Conclusiones

- Hay que considerar el contexto donde se realiza la intervención
- No solo se trata de la silla y la mesa
- Se debe incluir, en todo el proceso, a los trabajadores.
- Sólo tenemos un cuerpo
- La mejor postura es la que viene.
- A movernos más

El riesgo del sedente: del colegio al trabajo

Klgo. Ignacio Castellucci