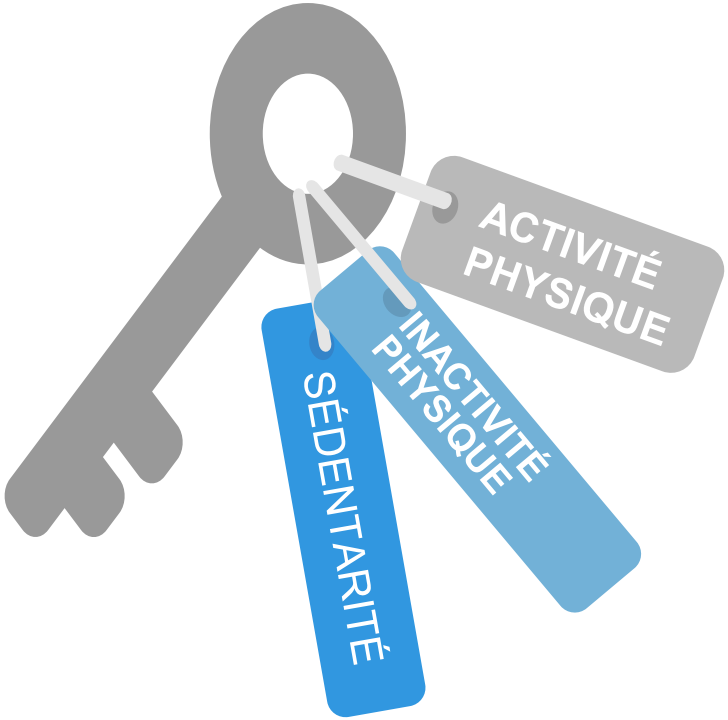
La sédentarité chez les enfants: quelle définition, quelles implications?

Premier colloque national, Paris le 12 Octobre 2016

David Thivel (PhD, MCU)

Metabolic Adaptations to Exercise under Physiological and Pathological conditions Laboratory (AME2P)
Clermont Auvergne University - Clermont-Ferrand
Research Center for Human Nutrition (CRNH Auvergne)
French National Observatory for Physical Activity & Sedentary Behavior (ONAPS)
European Childhood Obesity Group (ECOG)



Mouvement corporel produit par la contraction de muscles squelettiques en générant un DE > MB

Non atteinte des recommandations en Activité Physique

Activité <1.5 Mets (SBRN)

ONAPS
Observatoire National de l'Activité Physique et de la Sédentarité

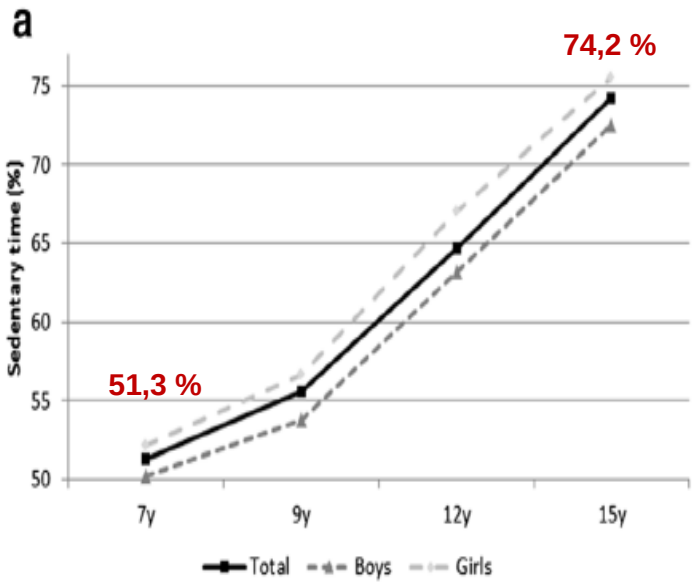
International Journal of Behavioral Nutrition and Physical Activity (2016) 13:88

RESEARCH Open Access

Development of sedentary behavior across childhood and adolescence: longitudinal analysis of the Gateshead Millennium Study

Xanne Janssen[1*], Kay D. Mann[2,3], Laura Basterfield[2,3], Kathryn N. Parkinson[3], Mark S. Pearce[2], Jessica K. Reilly[3], Ashley J. Adamson[2,3] and John J. Reilly[1]

N = 1752
7-15 ans
7-day Actigraph

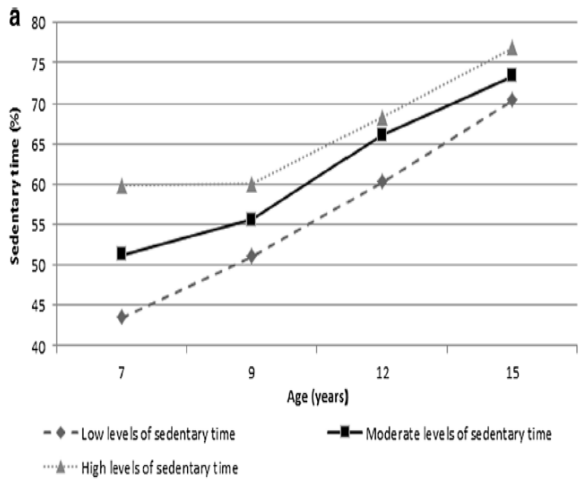


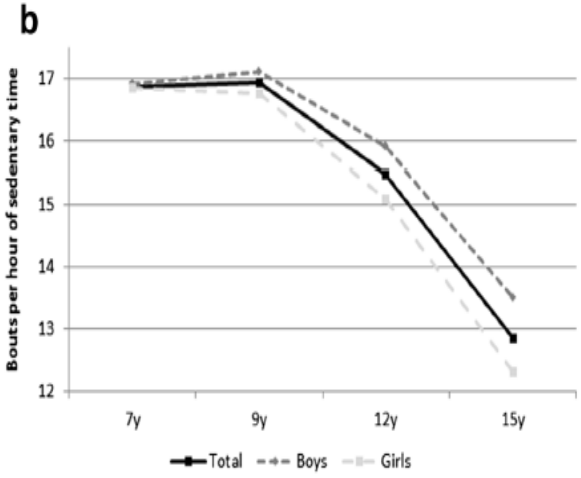
International Journal of Behavioral Nutrition and Physical Activity (2016) 13:88

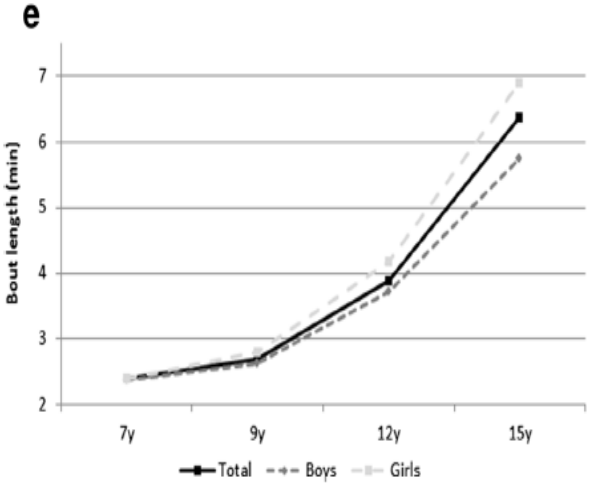
RESEARCH Open Access

Development of sedentary behavior across childhood and adolescence: longitudinal analysis of the Gateshead Millennium Study

Xanne Janssen[1*], Kay D. Mann[2,3], Laura Basterfield[2,3], Kathryn N. Parkinson[3], Mark S. Pearce[2], Jessica K. Reilly[3], Ashley J. Adamson[2,3] and John J. Reilly[1]



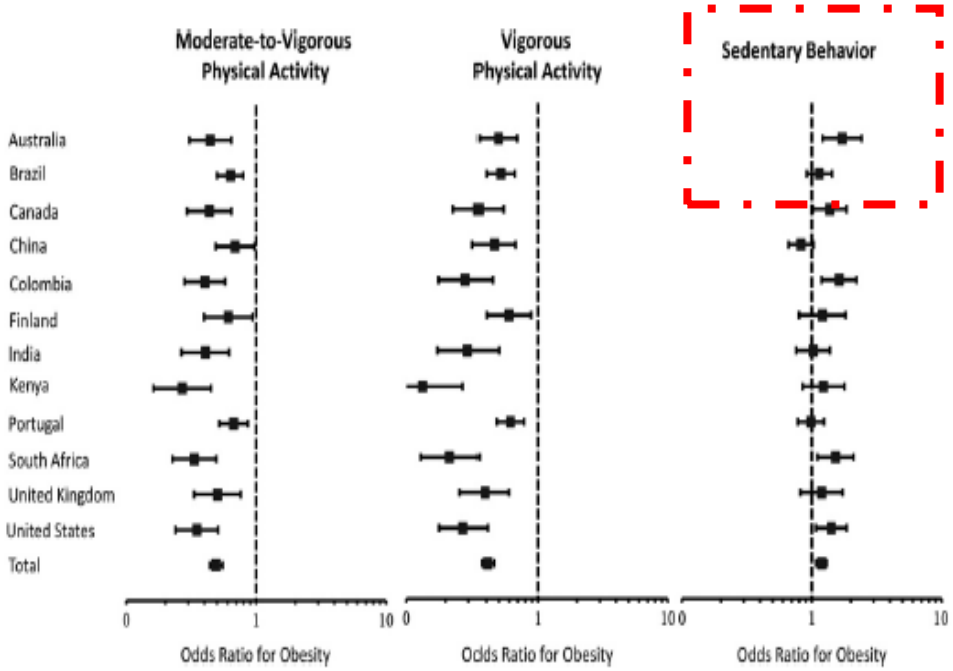




Physical Activity, Sedentary Time, and Obesity in an International Sample of Children

PETER T. KATZMARZYK[1], TIAGO V. BARREIRA[1], STEPHANIE T. BROYLES[1], CATHERINE M. CHAMPAGNE[1], JEAN-PHILIPPE CHAPUT[2], MIKAEL FOGELHOLM[3], GANG HU[1], WILLIAM D. JOHNSON[1], REBECCA KURIYAN[4], ANURA KURPAD[4], ESTELLE V. LAMBERT[5], CAROL MAHER[6], JOSE MAIA[7], VICTOR MATSUDO[8], TIMOTHY OLDS[6], VINCENT ONYWERA[9], OLGA L. SARMIENTO[10], MARTYN STANDAGE[11], MARK S. TREMBLAY[2], CATRINE TUDOR-LOCKE[1], PEI ZHAO[12], and TIMOTHY S. CHURCH[1]

Med. Sci. Sports Exerc., Vol. 47, No. 10, pp. 2062–2069, 2015.



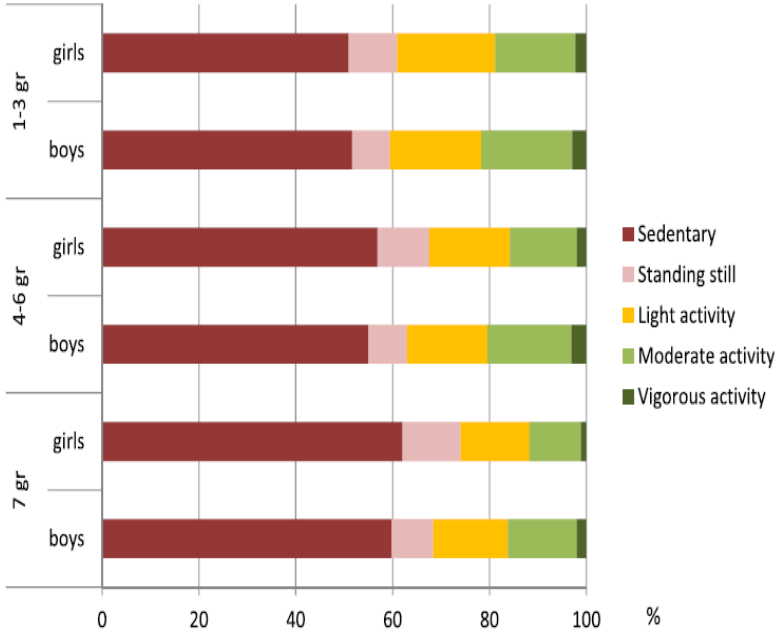
N = 851
10,3 ± 1,9 ans
7-day
Accelerometer

BMC Public Health (2016) 16:338

RESEARCH ARTICLE Open Access

Objectively measured sedentary behavior and physical activity of Finnish 7- to 14-year-old children– associations with perceived health status: a cross-sectional study

Pauliina Husu*, Henri Vähä-Ypyä and Tommi Vasankari



Sedentary Behaviour as an Emerging Risk Factor for Cardiometabolic Diseases in Children and Youth

Travis J. Saunders MSc, PhD [a,b,*], Jean-Philippe Chaput PhD [a,b], Mark S. Tremblay PhD [a,b]

Can J Diabetes 38 (2014) 53–61

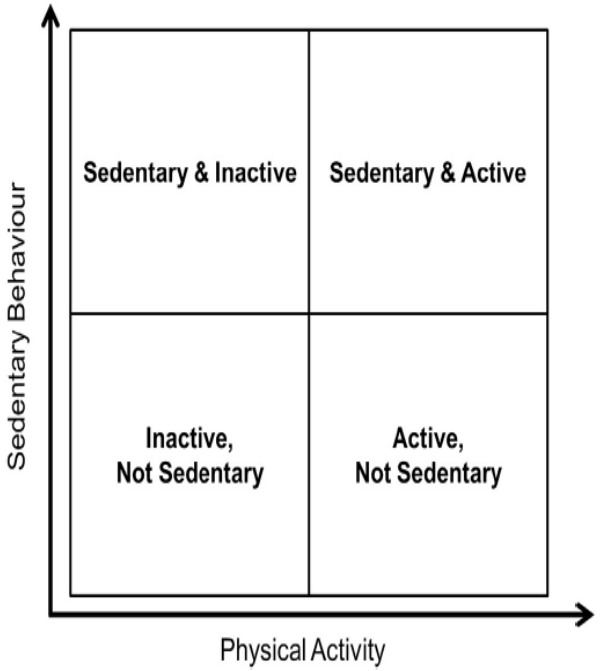


Figure 1. Sedentary behaviour and physical activity as distinct constructs.

Physical Activity, Sedentary Time, and Obesity in an International Sample of Children

PETER T. KATZMARZYK[1], TIAGO V. BARREIRA[1], STEPHANIE T. BROYLES[1], CATHERINE M. CHAMPAGNE[1], JEAN-PHILIPPE CHAPUT[2], MIKAEL FOGELHOLM[3], GANG HU[1], WILLIAM D. JOHNSON[1], REBECCA KURIYAN[4], ANURA KURPAD[4], ESTELLE V. LAMBERT[5], CAROL MAHER[6], JOSE MAIA[7], VICTOR MATSUDO[8], TIMOTHY OLDS[6], VINCENT ONYWERA[9], OLGA L. SARMIENTO[10], MARTYN STANDAGE[11], MARK S. TREMBLAY[2], CATRINE TUDOR-LOCKE[1], PEI ZHAO[12], and TIMOTHY S. CHURCH[1]

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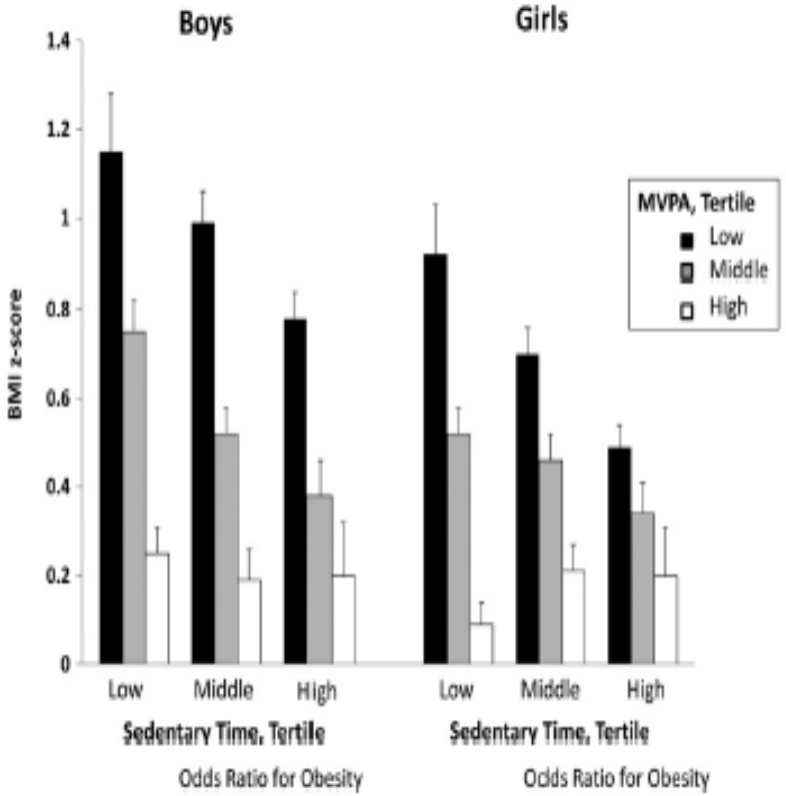
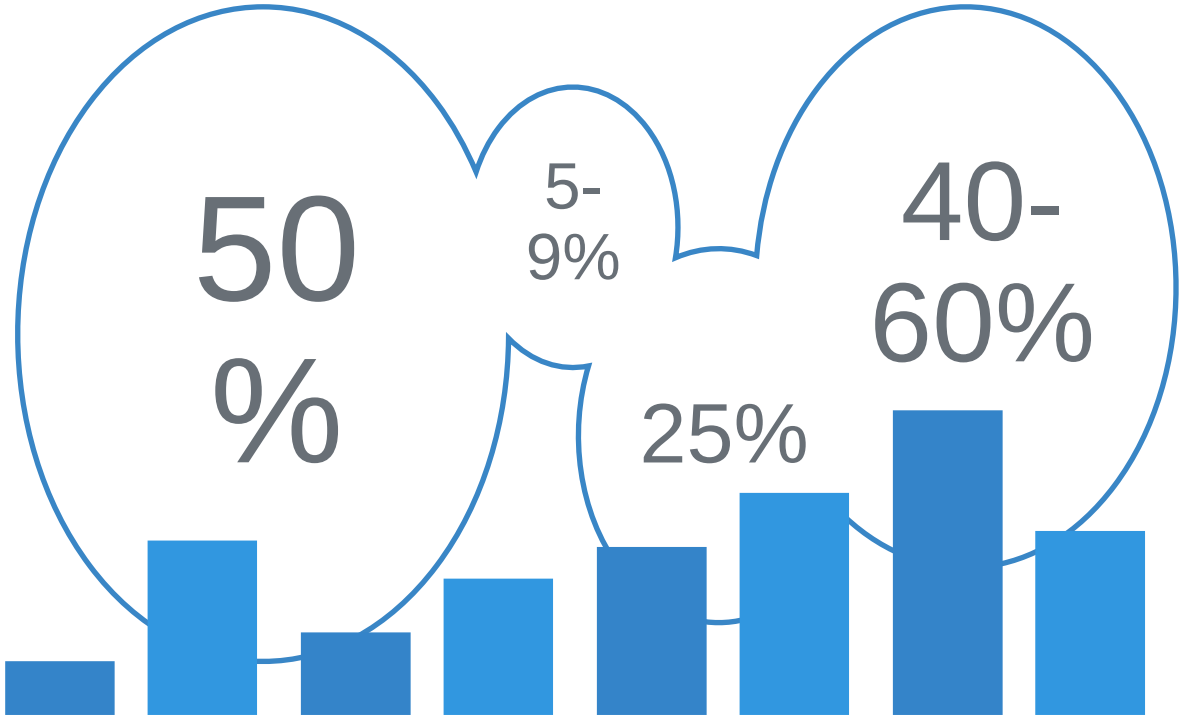
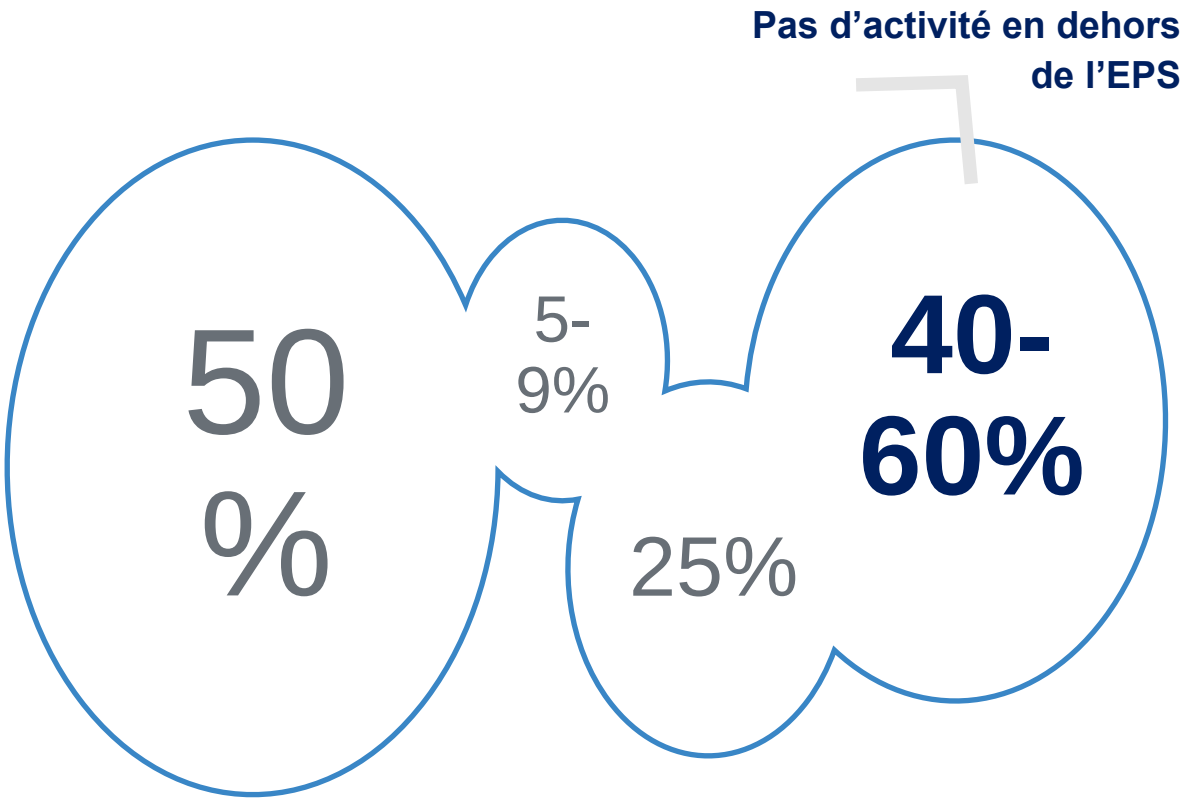
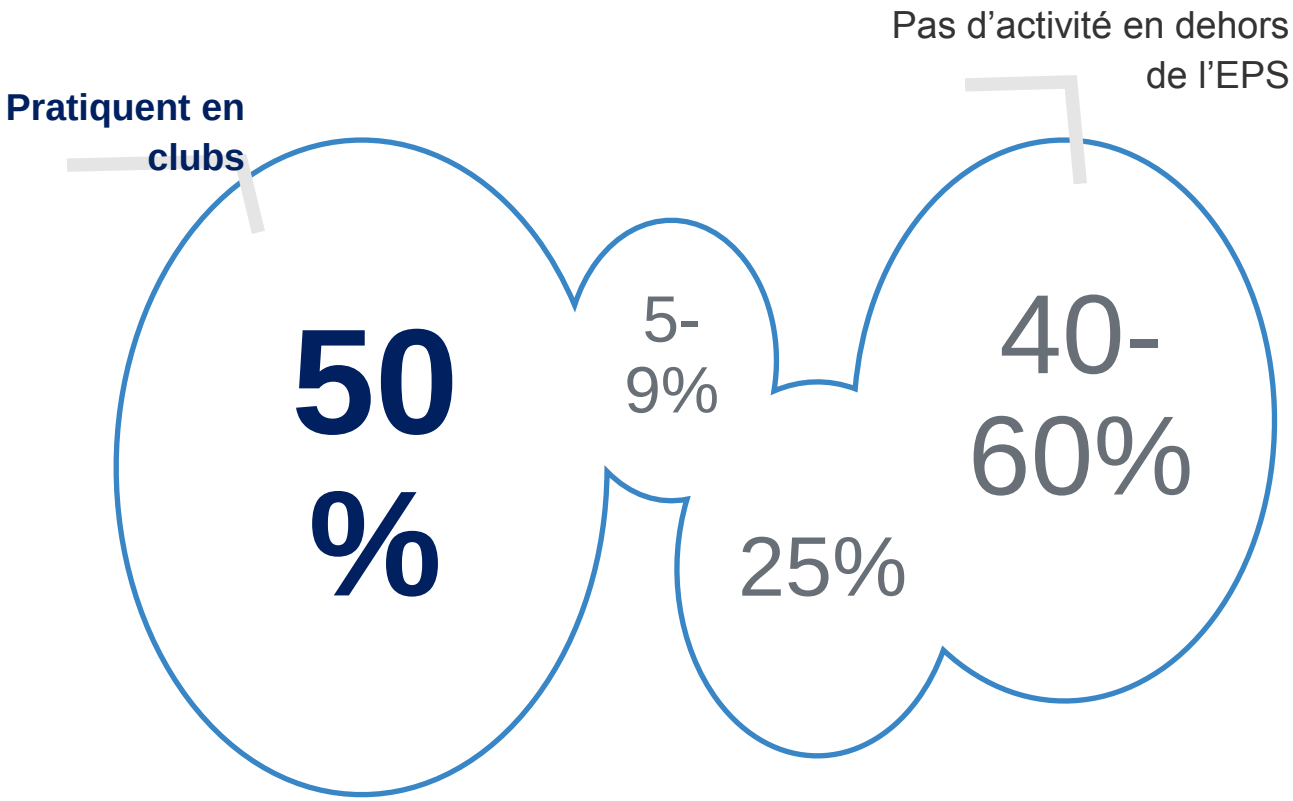


La sédentarité de nos enfants en quelques chiffres

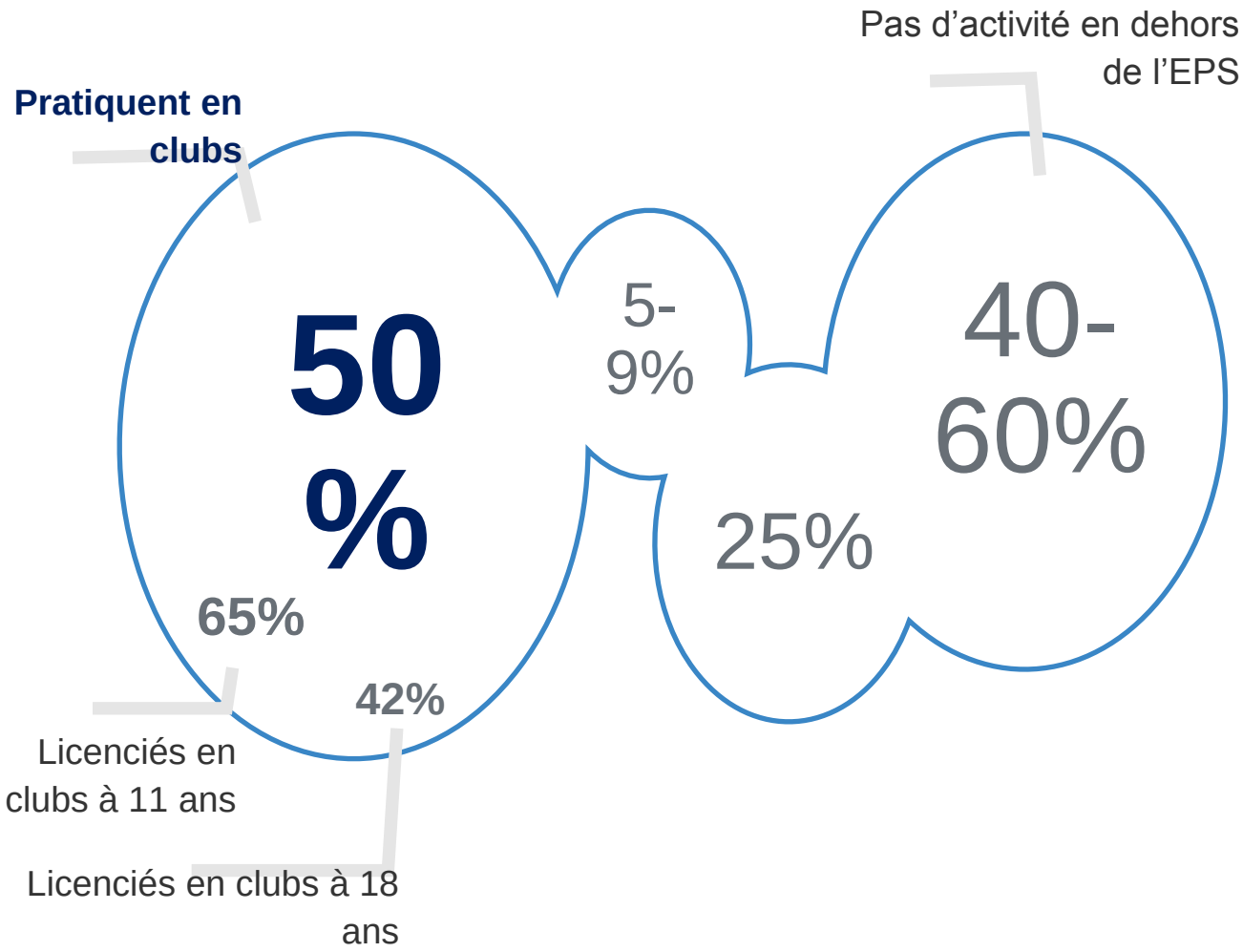




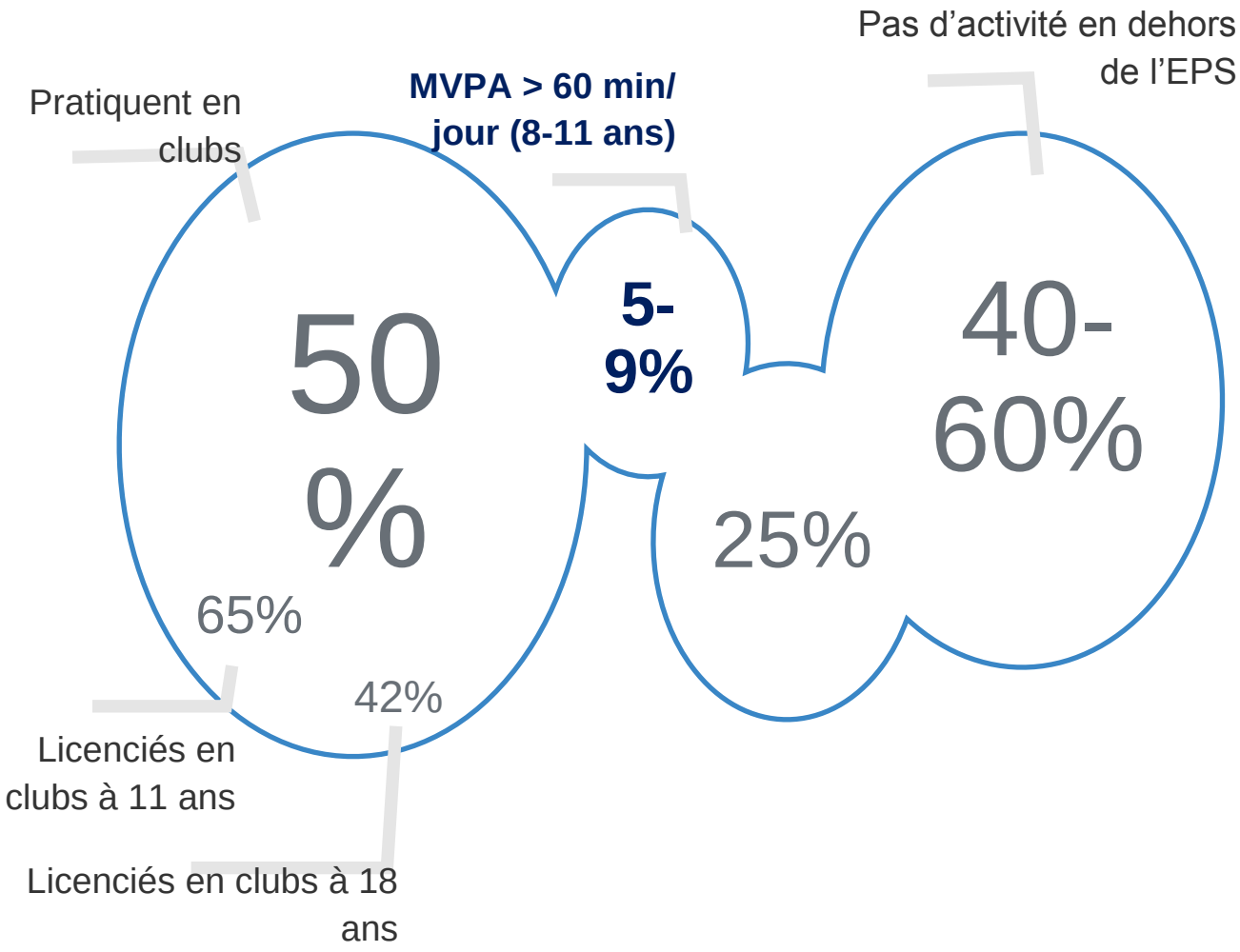
Sources: Etat des lieux de l’activité physique et de la sédentarité en France – Edition 2016 Onaps / Report Card France 2016



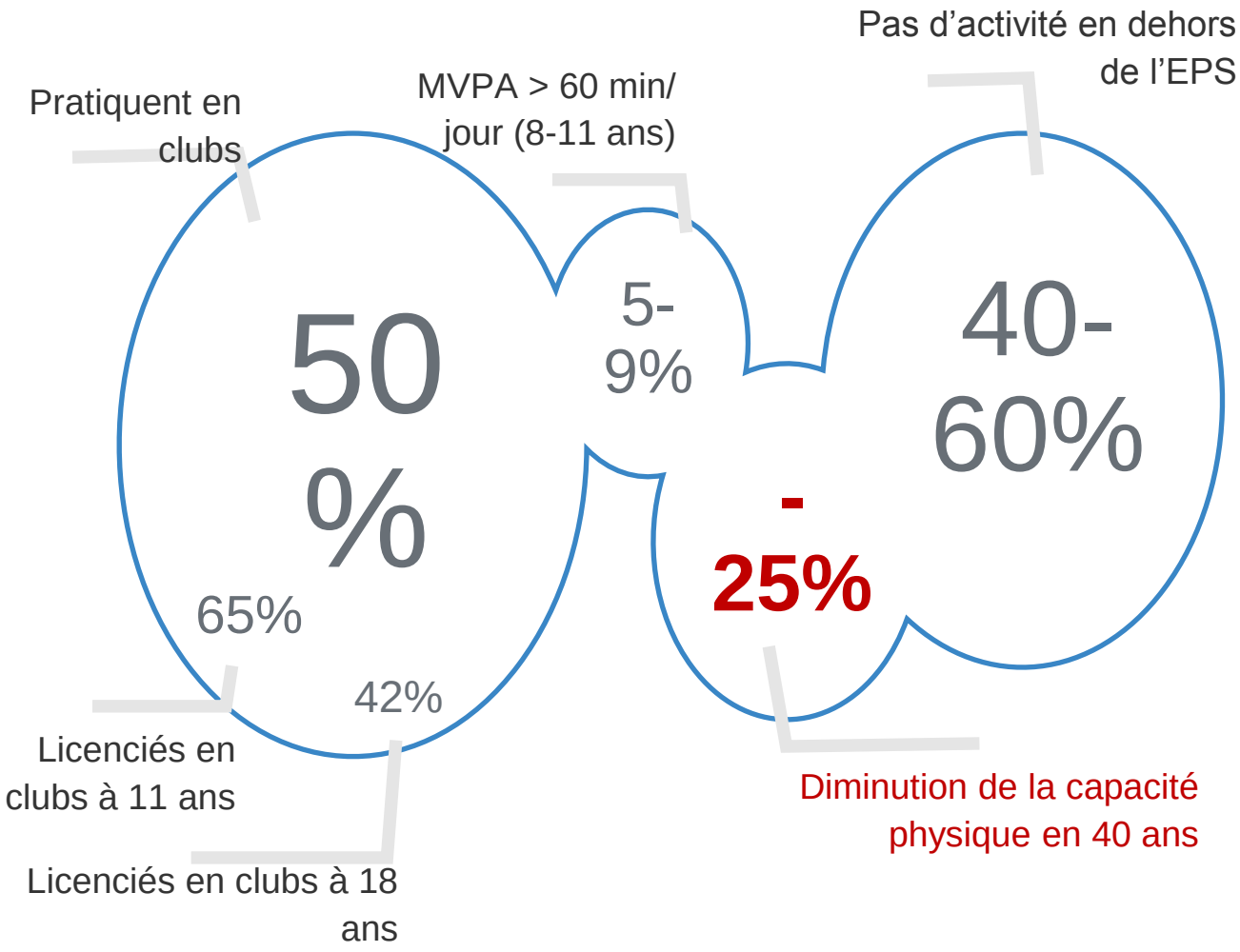
Sources: Etat des lieux de l'activité physique et de la sédentarité en France – Edition 2016 Onaps / Report Card France 2016



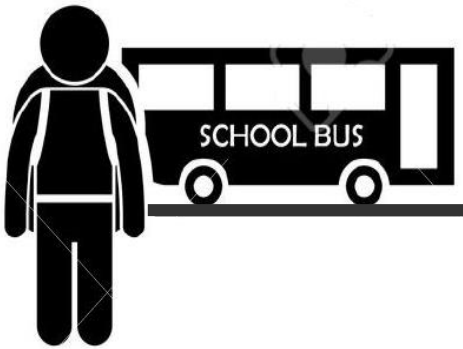
Sources: Etat des lieux de l’activité physique et de la sédentarité en France – Edition 2016 Onaps / Report Card France 2016



Sources: Etat des lieux de l'activité physique et de la sédentarité en France – Edition 2016 Onaps / Report Card France 2016

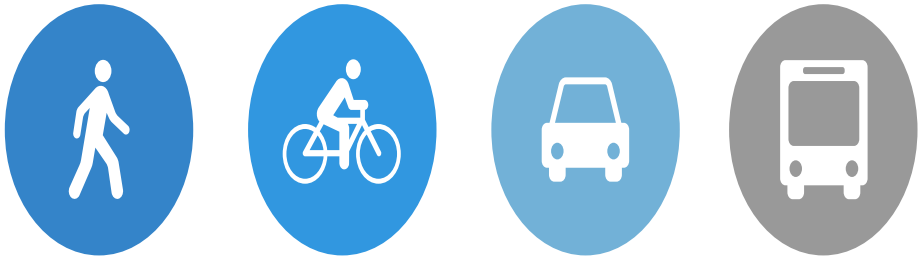


Sources: Etat des lieux de l'activité physique et de la sédentarité en France – Edition 2016 Onaps / Report Card France 2016



Trajets à l’école

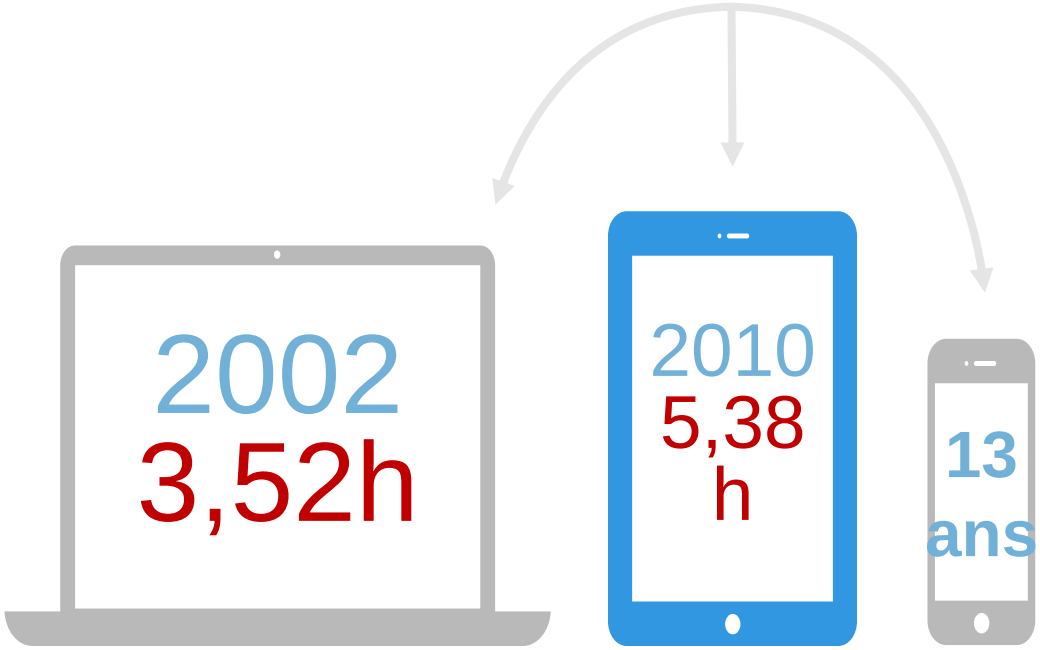
3-10 ans	39%	2%	49%	9%
11-14 ans	27%	4%	30%	39%



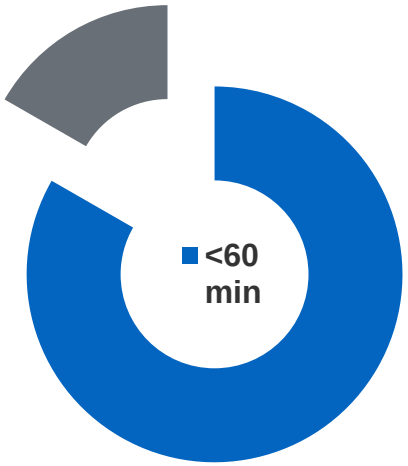
Sources : INCA 2 2006-2007

Evolution du temps d'écran

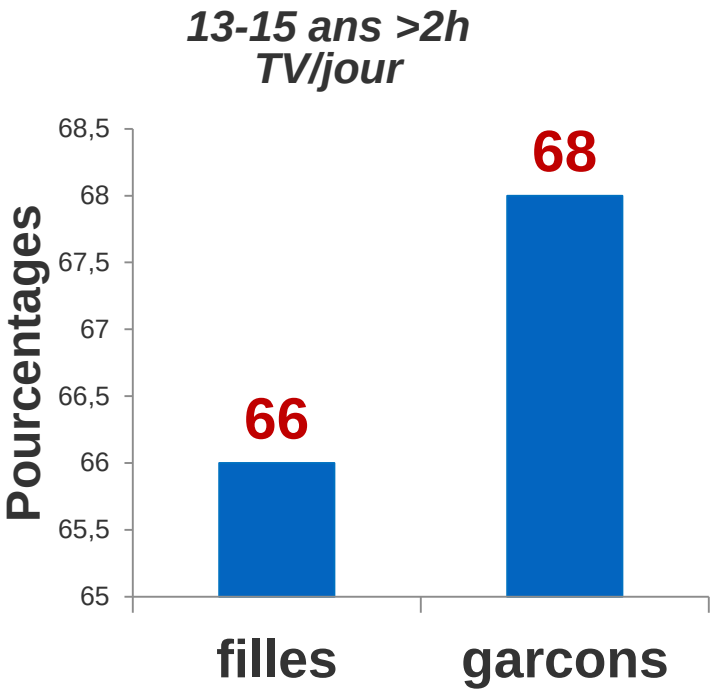
Bucksch et al., 2016.



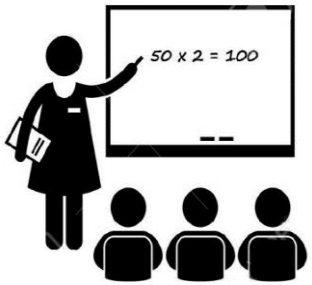
Evolution du temps d'écran



13-15 ans



Sources : WHO, 2008-2012



Temps scolaire & périscolaire

:30h

EMPLOI DU TEMPS *EDT Marion 3ème*

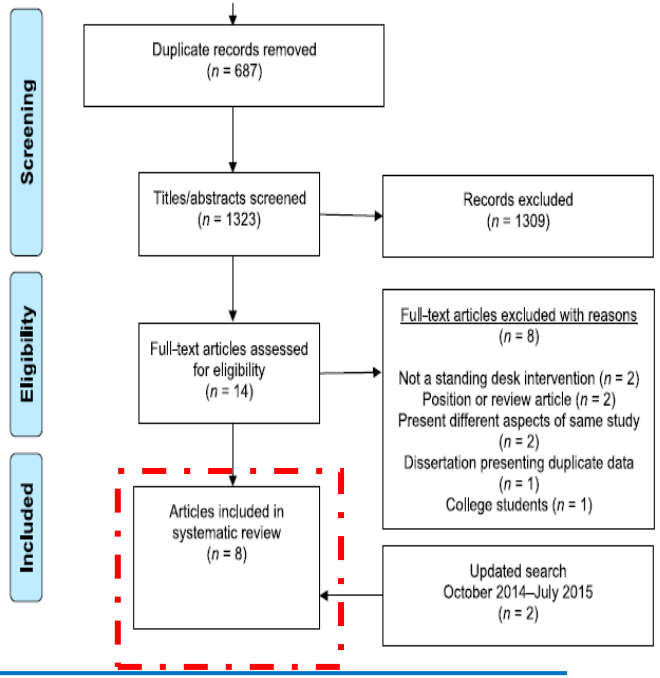
HEURES	LUNDI	MARDI	MERCREDI	JEUDI	VENDREDI	SAMEDI
8h 00 à 9h 00	TECHNO	ANGLAIS 5	MUSIQUE 134	LATIN	MATHS 119	
9h 00 à 10h 00	TECHNO	MATHS 119	HIST.-GÉO. 124	HIST.-GÉO. 124	DEUTSCH 9	
10h 00 à 11h 00	EPS	HIST.-GÉO. 124		FRANÇAIS 20	ANGLAIS 5	
11h 00 à 12h 00	EPS	DEUTSCH 9	PHYSIQUES 20	MATHS 119	REPAS	
12h 00 à 13h 00	MATHS 119	REPAS		vie de S4 classe / HIST. GÉO. S1	LATIN	
13h 00 à 14h 00	REPAS	ARTS-PLASTIQUES 105		REPAS	EPS S1	
14h 00 à 15h 00	FRANÇAIS S1 20	FRANÇAIS 20		ANGLAIS 5	EPS S1	
15h 00 à 16h 00	DEUTSCH 9	FRANÇAIS 20		FRANÇAIS 20	SVT-S2 / SVT S1	
16h 00 à 17h 00	PHYSIQUES 22	LATIN 126			SVT	

Sources: ParticipAction / Arundell et al., 2016

Pediatrics. 2016;137(2):e20153087

Classroom Standing Desks and Sedentary Behavior: A Systematic Review

Karl E. Minges, MPH,[a] Ariana M. Chao, PhD, RN, FNP-BC,[b,c] Melinda L. Irwin, PhD, MPH,[d] Neville Owen, PhD,[e,f,g,h] Chorong Park, MSN, RN,[a] Robin Whittemore, PhD, APRN,[a] Jo Salmon, PhD[i]



		Clemes et al, 2015[26a]	Aminian et al, 2015[27a]	Benden et al, 2014[25a]	Hinckson et al, 2013[30b]	Koepp et al, 2012[29a]	Benden et al, 2011[24a]	Lanningham-Foster et al, 2008[31b]	Cardon et al, 2004[32b]
Sedentary behavior and physical activity	Standing time	↑↔	↑		↑				↑
	Stepping time	↑↔	↑		↔				↑
	Step counts		↑	↑↔	↔	↔		↔	↑
	Sitting time	↓↓	↓		↓				
	Sit-to-stand counts		↓		↓				
	Screen time		↓						

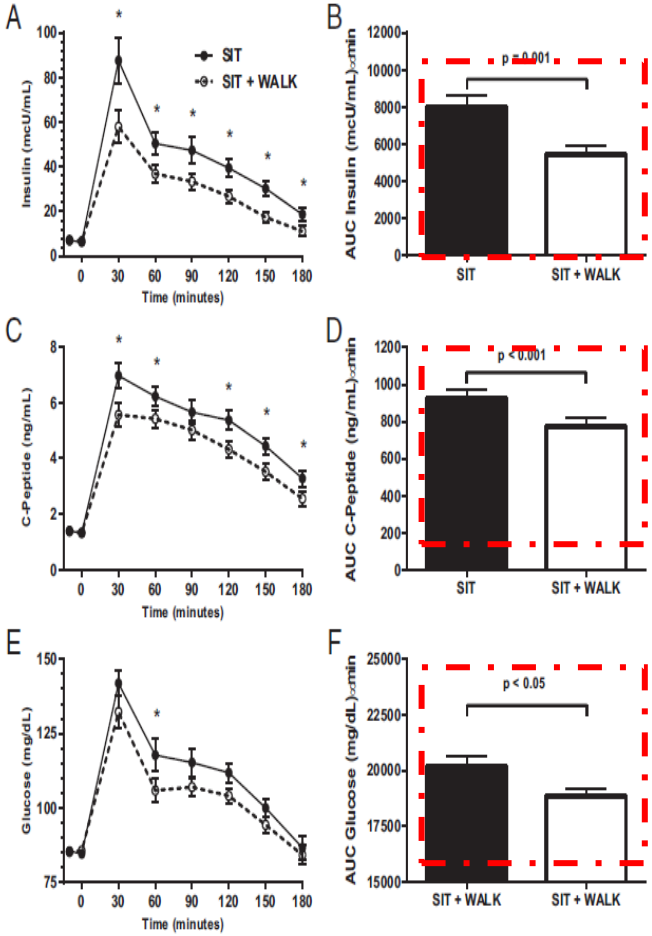
J Clin Endocrinol Metab, October 2015, 100(10):3735–3743

Effects of Interrupting Children's Sedentary Behaviors With Activity on Metabolic Function: A Randomized Trial

Britni R. Belcher, David Berrigan, Alexia Papachristopoulou, Sheila M. Brady, Shanna B. Bernstein, Robert J. Brychta, Jacob D. Hattenbach, Ira L. Tigner Jr, Amber B. Courville, Bart E. Drinkard, Kevin P. Smith, Douglas R. Rosing, Pamela L. Wolters, Kong Y. Chen, and Jack A. Yanovski

7-11 ans

3'
(30min)



≈30h

≈7-8h

≈40%

EMPLOI DU TEMPS *EDT Marion 3ème*

HEURES	LUNDI	MARDI	MERCREDI	JEUDI	VENDREDI	SAMEDI	DIMANCHE
8h00 à 9h00	TECHNO	ANGLAIS 5	MUSIQUE 134	LATIN	MATHS 119		
9h00 à 10h00	TECHNO	MATHS 119	HIST.-GEO. 124	HIST.-GEO. 124	DEUTSCH 9		
10h00 à 11h00	EPS	HIST.-GEO. 124		FRANÇAIS 20	ANGLAIS 5		
11h00 à 12h00	EPS	DEUTSCH 9	PHYSIQUES 22	MATHS 119	REPAS		
12h00 à 13h00	MATHS 119	REPAS		vie de S1 classe S1 HIST. GEO.	LATIN		
13h00 à 14h00	REPAS	ARTS-PLASTIQUES 105		REPAS	EPS S1		
14h00 à 15h00	FRANÇAIS S1 20	FRANÇAIS 20		ANGLAIS 5	EPS S1		
15h00 à 16h00	DEUTSCH 9	FRANÇAIS 20		FRANÇAIS 20	SVT-S1 SVT S1		
16h00 à 17h00	PHYSIQUES 22	LATIN 126			SVT		

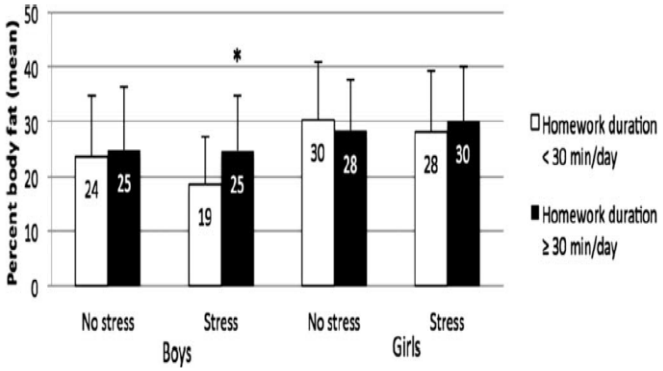
Sources: ParticipAction / Arundell et al., 2016

Original Article
PEDIATRIC OBESITY

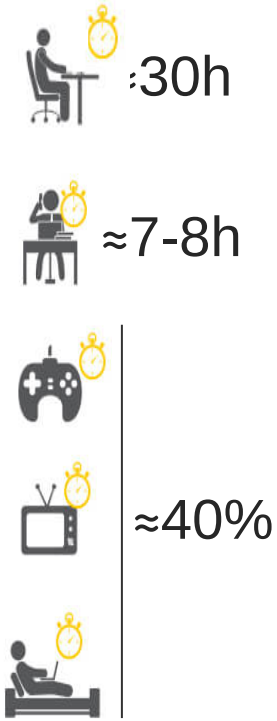
Obesity

Long Duration of Stressful Homework as a Potential Obesogenic Factor in Children: A QUALITY Study

Isabelle Michaud[1,2,3], Jean-Philippe Chaput[4], Jennifer O'Loughlin[5], Angelo Tremblay[6], and Marie-Eve Mathieu[1,3]



		BMI (percentile)		Fat mass (%)		Trunk body fat (%)	
	n	Median (Q1-Q3)	*P* value	Median (Q1-Q3)	*P* value	Median (Q1-Q3)	*P* value
Boys							
All							
Homework (min/day) < 30	127	71.6 (45.6-90.8)	0.322	19.7 (13.4-28.0)	0.013[f]	16.8 (10.8-25.9)	0.013[f]
Homework (min/day) ≥ 30	151[a]	75.3 (45.4-94.7)		22.9 (15.6-32.8)		19.6 (12.1-31.1)	



EMPLOI DU TEMPS *EDT Marion 3ème*

HEURES	LUNDI	MARDI	MERCREDI	JEUDI	VENDREDI	SAMEDI	DIMANCHE
8h 00 à 9h 00	TECHNO	ANGLAIS 5	MUSIQUE 134	LATIN	MATHS 119		
9h 00 à 10h 00	TECHNO	MATHS 119	HIST.-GEO. 134	HIST.-GEO. 124	DEUTSCH 9		
10h 00 à 11h 00	EPS	HIST.-GEO. 124		FRANÇAIS 20	ANGLAIS 5		
11h 00 à 12h 00	EPS	DEUTSCH 9	PHYSIQUES 20	MATHS 119	REPAS		
12h 00 à 13h 00	MATHS 119	REPAS		vie de la classe / HIST. GEO. S1	LATIN		
13h 00 à 14h 00	REPAS	ARTS-PLASTIQUES 105		REPAS	EPS S1		
14h 00 à 15h 00	FRANÇAIS S1 20	FRANÇAIS 20		ANGLAIS 5	EPS S1		
15h 00 à 16h 00	DEUTSCH 9	FRANÇAIS 20		FRANÇAIS 20	SVT-S1 / SVT S1		
16h 00 à 17h 00	PHYSIQUES 22	LATIN 126			SVT		

Sources: ParticipAction / Arundell et al., 2016

Int. J. Environ. Res. Public Health **2014**, *11*, 7163-7181; doi:10.3390/ijerph110707163

OPEN ACCESS

International Journal of
Environmental Research and
Public Health
ISSN 1660-4601
www.mdpi.com/journal/ijerph

Article

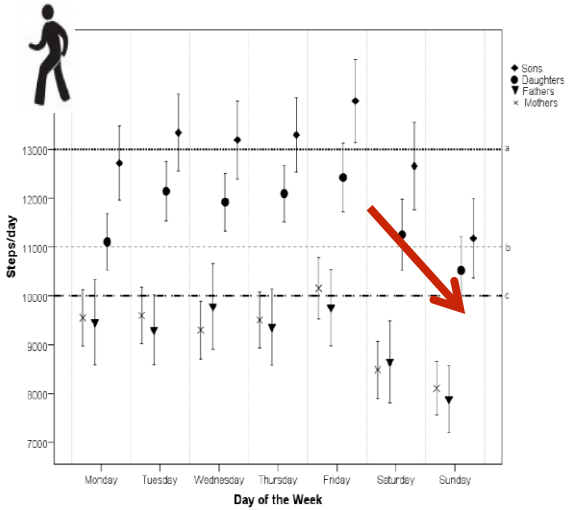
Parent-Child Associations in Pedometer-Determined Physical Activity and Sedentary Behaviour on Weekdays and Weekends in Random Samples of Families in the Czech Republic

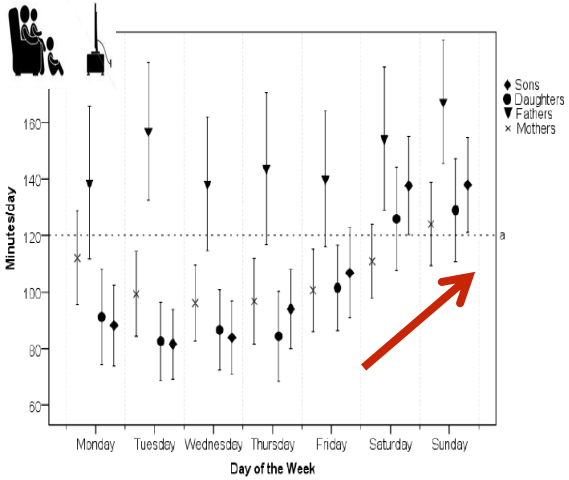
Dagmar Sigmundová [1], Erik Sigmund [1,*], Jana Vokáčová [2] and Jaroslava Kopčáková [1,3]

388 parents (35-45 ans)

485 enfants (9-12 ans)

7 jours pédomètres + temps d'écran





Sleep Medicine Reviews 29 (2016) 76–100

Contents lists available at ScienceDirect

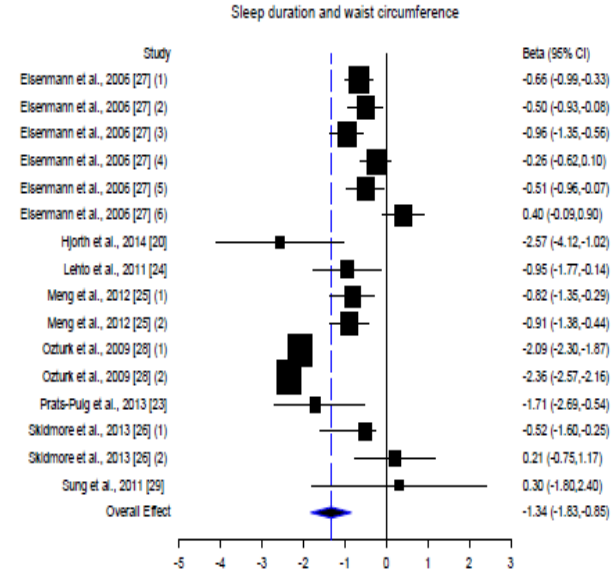
Sleep Medicine Reviews

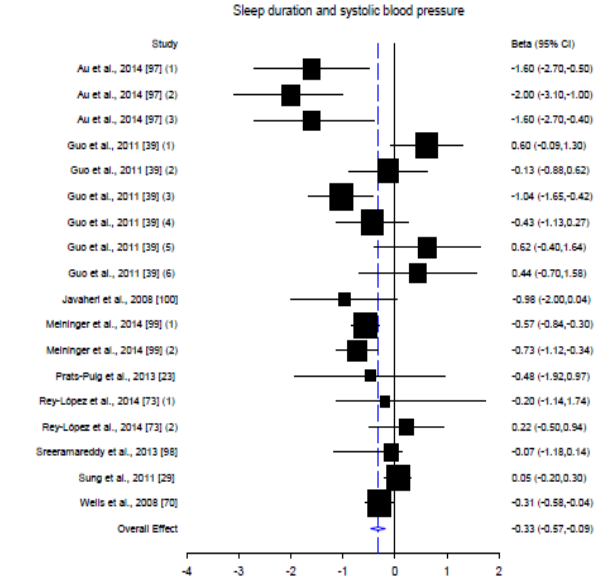
journal homepage: www.elsevier.com/locate/smrv

CLINICAL REVIEW

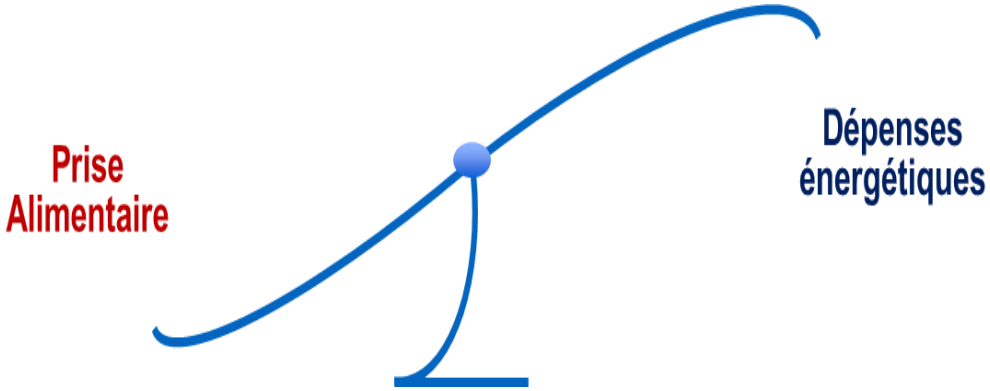
Sleep and cardiometabolic risk in children and adolescents

Jonas S. Quist [a,*], Anders Sjödin [b], Jean-Philippe Chaput [c], Mads F. Hjorth [b]





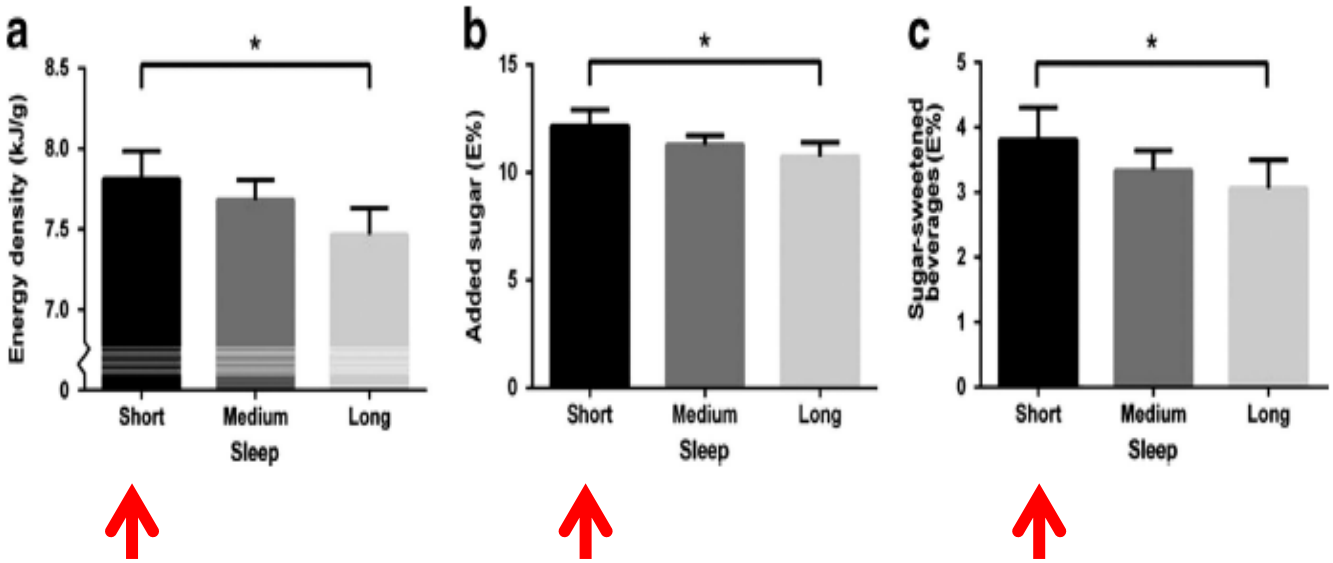
Adaptations nutritionnelles?

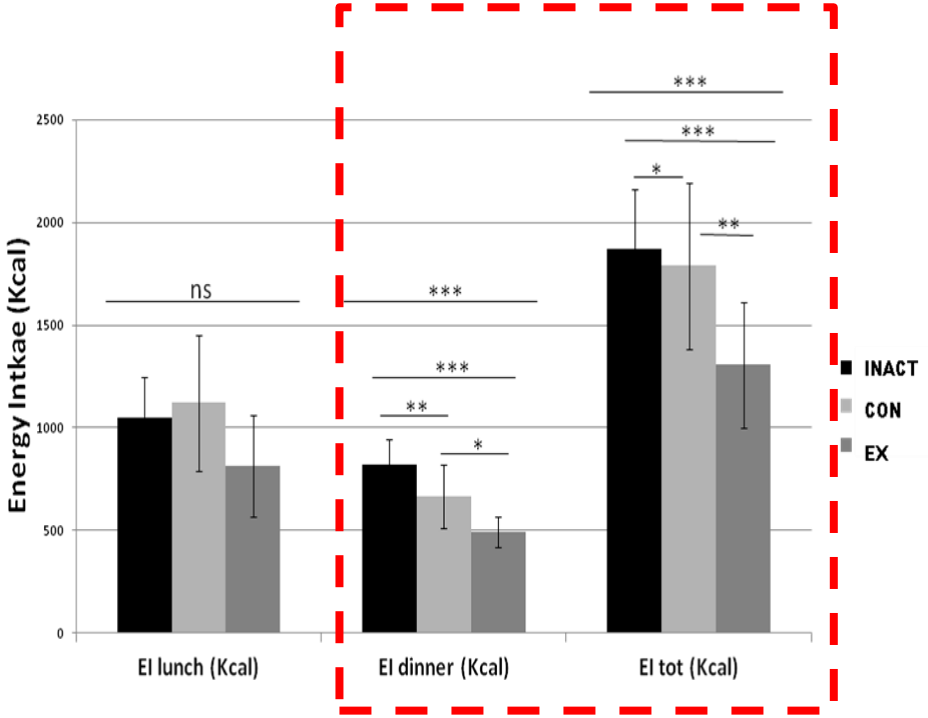


Short sleep duration and large variability in sleep duration are independently associated with dietary risk factors for obesity in Danish school children

JS Kjeldsen[1,2,5], MF Hjorth[2,5], R Andersen[3], KF Michaelsen[2], I Tetens[3], A Astrup[2], J-P Chaput[4] and A Sjödin[2]

International Journal of Obesity (2014) **38**, 32–39

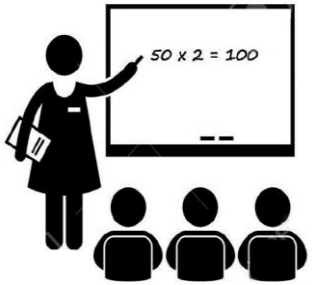




The Effects of Imposed Sedentary Behavior and Exercise on Energy Intake in Adolescents With Obesity

David Thivel, PhD,* Lore Metz, PhD,* Julien Aucouturier, PhD,† Katrina Brakoniecki, MSc,‡ Pascale Duche, PhD,* Béatrice Morio, PhD§¶

(J Dev Behav Pediatr 0:1–7, 2013)



British Journal of Nutrition (2014), **111**, 747–754
doi:10.1017/S000711451300295X
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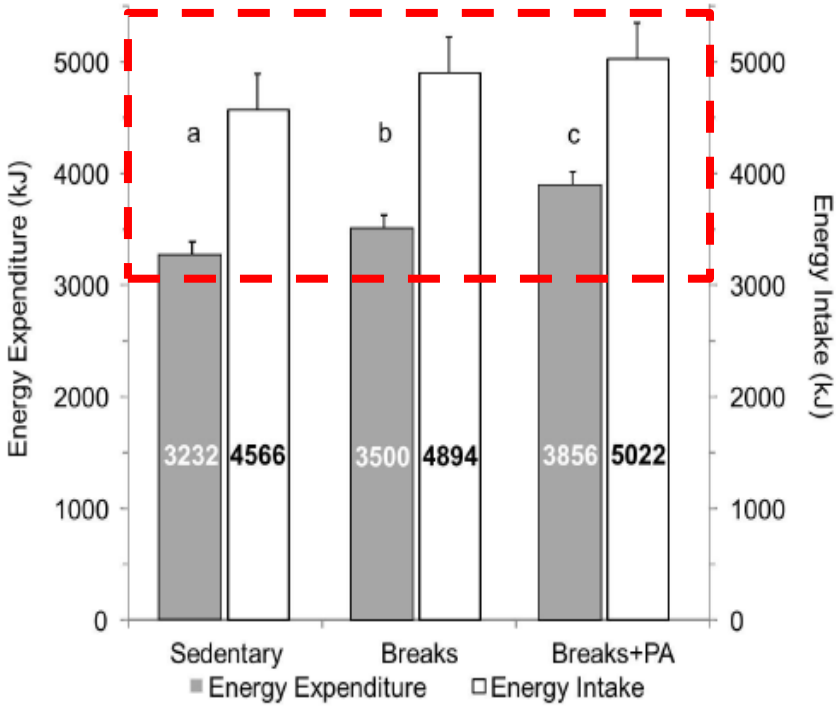
Children and youth do not compensate for an imposed bout of prolonged sitting by reducing subsequent food intake or increasing physical activity levels: a randomised cross-over study

Travis J. Saunders[1,2]*, Jean-Philippe Chaput[1,2], Gary S. Goldfield[1,2], Rachel C. Colley[1,2], Glen P. Kenny[2], Eric Doucet[2] and Mark S. Tremblay[1,2]



Comparison of characteristics and dietary intake of QUALITY[a] subjects between 2 screen time groups.

	Screen time[b]				P-value
	Low (n = 226)		High (n = 295)		
	Mean	SD	Mean	SD	
Children					
Age (year)	9.5	0.9	9.7	0.9	0.003
Boys (%)	45		62		<0.001
Children's BMI (kg/m^2)	18.4	3.4	20.4	4.8	<0.001
Overweight/obese (%)	34		49		<0.001
Screen time (h/d)[c]	1.2	0.7	3.6	2.4	<0.001
Physical activity (counts/min)	594	188	582	184	0.430
Parents					
Mothers' BMI (kg/m^2)	28.8	6.1	30.0	7.0	0.031
Fathers' BMI (kg/m^2)	30.3	5.5	31.0	5.4	0.146
Household income	43,763	17,883	40,929	19,390	0.064
Parent holding a university degree (%)	61		50		0.005
Children's dietary intake					
Energy (kcal)	1639	387	1722	395	0.010
Total fat (g/1000 kcal)	36	5.8	36	5.1	0.411
Total added sugar (g/1000 kcal)	29	11	30	12	0.290
Fiber (g/1000 kcal)	8.4	2.1	7.7	2.0	<0.001
Sodium (mg/1000 kcal)	1422	304	1484	349	0.019
Sugar-sweetened beverages (mL/1000 kcal)	79	93	87	90	0.282
Hamburger/hot dog/pizza (g/1000 kcal)	15	24	17	28	0.244
Vegetables & fruit (serving/1000 kcal)	2.8	1.3	2.5	1.3	0.004
Dairy products (serving/1000 kcal)	1.2	0.5	1.1	0.5	0.098
HEI-C[d]	79	9.8	78	9.3	0.119

Preventive Medicine Reports 2 (2015) 265–269

Contents lists available at ScienceDirect

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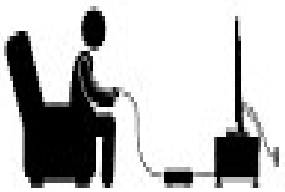
journal homepage: http://ees.elsevier.com/pmedr

Screen time is associated with dietary intake in overweight Canadian children☆,☆☆,★,★★

Lei Shang[a,b], JiaWei Wang[b,*], Jennifer O'Loughlin[c,d], Angelo Tremblay[e], Marie-Ève Mathieu[f], Mélanie Henderson[g], Katherine Gray-Donald[b,h]

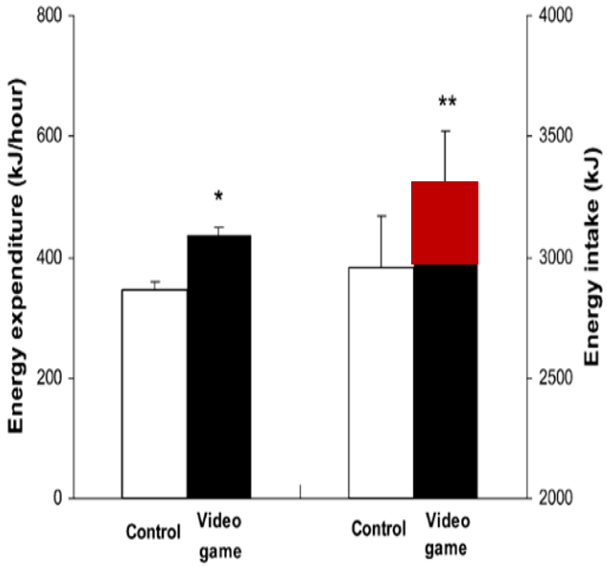
N = 630

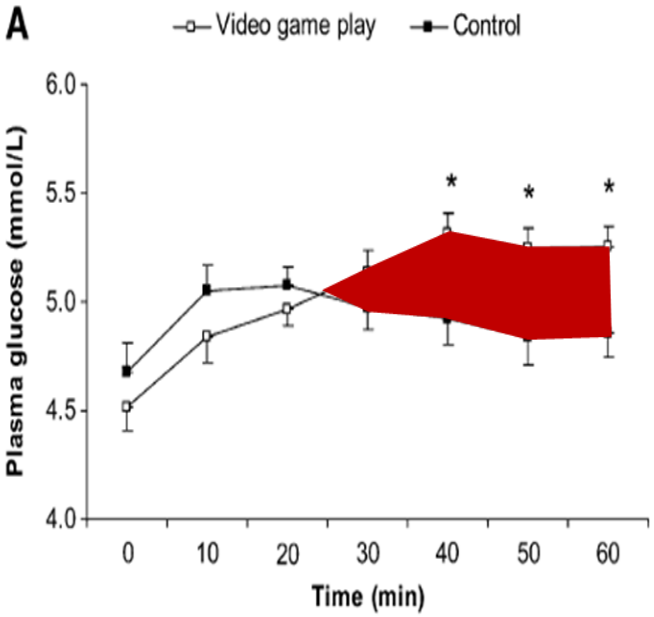
8 - 10 ans



Video game playing increases food intake in adolescents: a randomized crossover study[1–3]

Jean-Philippe Chaput, Trine Visby, Signe Nyby, Lars Klingenberg, Nikolaj T Gregersen, Angelo Tremblay, Arne Astrup, and Anders Sjödin





British Journal of Nutrition (2016), **115**, 547–553
doi:10.1017/S0007114515004602
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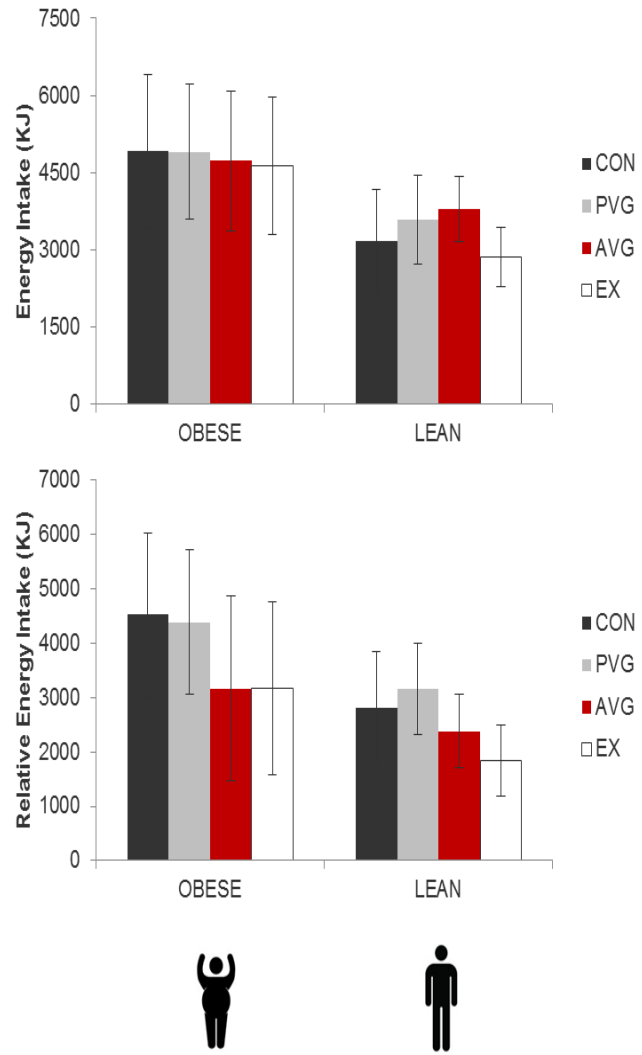
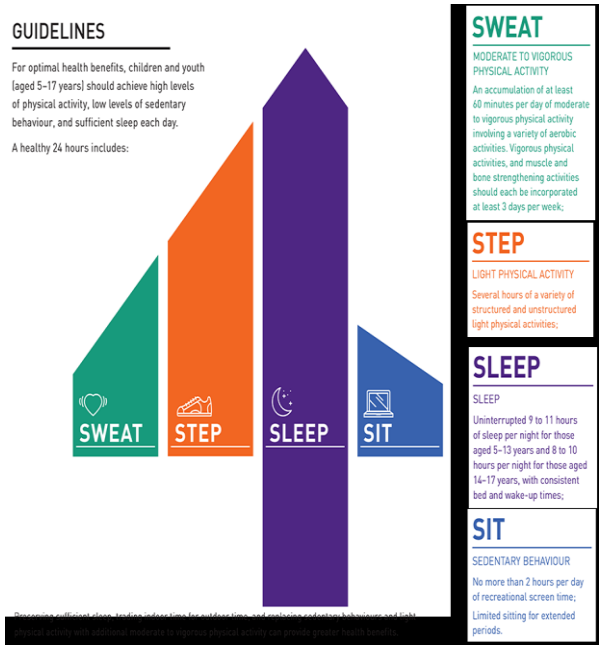
Food intake response to exercise and active video gaming in adolescents: effect of weight status

J. P. Chaput[1,2], A. Tremblay[3], B. Pereira[4], Y. Boirie[5,6,7,8], M. Duclos[6,7,8,9] and D. Thivel[7,10]*



Recommandations ?



The Canadian Society for Exercise Physiology (CSEP)
The world's first 24-Hour Movement Guidelines for Children and Youth (5-17 years)
(2016 ParticipACTION Report Card on Physical Activity for Children and Youth)

Report Card

Activité Physique et Sédentarité des enfants et adolescents

En partenariat avec ONAPS
Observatoire National de l'Activité Physique et de la Sédentarité

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Dr CARDENOUX Charlotte
M. GUETOUCH Tufik

Merci de votre attention

"It looks as though man should be regarded now, if not in the past, as a predominantly sedentary rather than an upright animal"

Edholm, Fletcher, Widdowson & McCance, *BJN*, 1955