

Santos, D. A., Magalhães, J. P., Júdice, P. B., Correia, I. R., Minderico, C. S., Ekelund, U., Sardinha, L. B. (2019). Fitness Mediates Activity and Sedentary Patterns Associations with Adiposity in Youth. *Medicine & Science in Sports & Exercise*, 51, 323-329.

Dette er siste tekst-versjon av artikkelen, og den kan inneholde små forskjeller fra forlagets pdf-versjon. Forlagets pdf-versjon finner du her:
<http://dx.doi.org/10.1249/MSS.0000000000001785>

This is the final text version of the article, and it may contain minor differences from the journal's pdf version. The original publication is available here:
<http://dx.doi.org/10.1249/MSS.0000000000001785>

Fitness mediates activity and sedentary patterns associations with adiposity in youth"

F kpc" C0' Ucpvqu^{3,4}. "Lq- q" R0' O ci cnj - gu³. "Rgf tq" D0' Lf leg^{3,4}. "Kp' u" T0' Eqttgk³. "En' wf k" U0' O kpf gtkeq^{3,4}. "Wh' Gngw⁵. "Nw' u" D0' Uctf k³ c³"

"

³Gzgteku"cpf "J gcmj "Ncdqtcvqt { "Kpvtf kuek nkct { "Egpvt' hqt" y g"Uwf { "qh"J wo cp"

Rgthqto cpeg. "Heww cf g'f g'O qvtekf cf g"J wo cpc. "Wpkxgtukf cf g'f g'Nkudqc. "Etw /S wgdtef c"/"

Rqtwi cn'

⁴Nwqhpc "Wpkxgtukf. "Nkudqp" o "Rqtwi cn'

⁵F gr ctwo gpv'qh'Ur qtv'O gf kekpg. "P qty gi kcp" Uej qqn'qh'Ur qtv'Uekpegu. "P qty c { "

"

"

Running Title:

Cf kr quk { <Hkpgu' dghqtg' hcvpguu

Correspondence:

Nw' u" D0' Uctf k³ c. "Rj F "

Gzgteku"cpf "J gcmj "Ncdqtcvqt { "Kpvtf kuek nkct { "Egpvt' hqt" y g"Uwf { "qh"J wo cp"

Rgthqto cpeg. "Heww { "qh"J wo cp" Mkpgeuo' Wpkxgtukf { "qh" Nkudqp= Gwtcf c' f c' Equc. "36; ; /224"

Etw /S wgdtef c. "Rqtwi cn'

Rj qpg <*573+43'636"; 3'82=Hcz <*573+43'636"; 3"; 5=g/o ckn <[uctf k³ cB ho j 0wkudqc0 v](#)"

"

"

Abstract

Purpose: Y g'cklo gf "v"gzco kpg'vj g'etquu/ugevkvpcn'cuuqekvkvpu'qh'r cwgtpu'qh'ugf gpvct { "vko g" *UV+cpf "o qf gtcvg/vq/xki qtqwu'r j { ukecn'cevxkv { "O XRC+y kj "vqcn'hc'vo cuu'lpf gz "HO K"cpf " cdf qo kpcn'hc'vo cuu'lpf gz "HO K_{df}+lp'ej krf tgp."cpf "cf f kvkqpcn{ ."v"cpcn{ | g'kh" ectf kqtgur ktcvqt { "hkpguu"ETH"o gf kcvgf "vj gug"cuuqekvkvpu0**Methods:** HO K_{df} "HO K_{df} 'y gtg" cuuguugf 'y kj "F Z C"lp"555"r ct vkr cpw"394"i knu+ci gf "; /33" { gctu0O XRC."UV."dtgcm'lp" ugf gpvct { "vko g'r gt'ugf gpvct { "j qw "DUVIUV+cpf "vj g'pwo dgt "qh'f ckn{ "ugf gpvct { "dqwu'y kj " xctkqwu'ngpi vj u"3/6.'7/; .32/36."cpf "x37"o kpwgu+y gtg"cuuguugf 'y kj "ceegngtqo gt { "cpf " ETH'wulpi "c"o czko crle { eng'vgu0J c { guo'PROCESS"o cetq'hqt"URUU'y cu'wugf 'hqt"o gf kcvkp" cpcn{ uku0**Results:** "Vj g'pwo dgt "qh'uj qtvt'ugf gpvct { "dqwu"3/6"o kpwgu+y cu'lp'xgtugn{ " cuuqekvkvf 'y kj "HO K" "?/202: + 'y j gtgcu'hqpi gt'ugf gpvct { "dqwu"7/; "o kpwgu." ?208; =32/ 36"o kpwgu." ?208; 5=x37"o kpwgu." ?2099+"j cf "c"r qukvxg"cuuqekvkv. "lpf gr gpf gpv'qh" O XRC"r >2027+0C"uko kct "tgpf 'y cu'hqwpf 'hqt"HO K_{df}0O XRC"y cu'pgi cvkxgn{ 'tgrcvgf "v"HO K * ?/2024; +cpf "v"HO K_{df} " ?/2025+0Vj gtg'y gtg'pq"o clp"cuuqekvkvpu'hqt"UV"cpf "DUVIUV" *r @2027+0ETH'y cu'lp'xgtugn{ 'tgrcvgf "v"vqcn'cpf "cdf qo kpcn'cf kr qukv{ ."cpf "c"rcti g'r qt vkv" *620 /870' +qh'vj g"cuuqekvkvpu'qh'O XRC"cpf "ugf gpvct { "dqwu'y kj "dqy "HO K_{df} "HO K_{df} " y gtg"o gf kcvgf "d { "ETH0**Conclusion:** "vko g'lp"O XRC"cpf "ceewo wrcvki "UV"lp'uj qtvt" ugf gpvct { "dqwu'ku'lp'xgtugn{ 'tgrcvgf "v"cf kr qukv{ 0J qy gxgt."vj gug"cuuqekvkvpu"o c { "dg" o gf kcvgf "d { "ETH0Go r j cuku'uj qwf "dg"i kxgp"v"r tqi tco u'vj cv'cti gv'lpetgcugu'lp"O XRC." y j lej "o c { "lphwpeg"ETH'y j krg'tgf welpi "ugf gpvct { "tgetgcvkpcn'dgj cxlqtu0

Key Words: dtgcm'lp'ugf gpvct { "vko g="dqwu'qh'ugf gpvct { "vko g="r j { ukecn'cevxkv { = ectf kqtgur ktcvqt { "hkpguu="vqcn'dqf { "hcv="cdf qo kpcn'dqf { "hc'0

Introduction

Ej kf j qf "qdguk{ 'ku'c'utqpi 'r tgf kvqt 'qh' {qwj 'cpf 'cf wv'o qtdkf kv{ '*3+'y kj " cdf qo kpcn'qdguk{ 'r rc { kpi 'c'ng{ 'tqng'lp'y g'emwvgt 'qh'tkumhcevtu'cuuqekcvf 'y kj 'o gvcdqrle " u{pf tqo g'cpf 'ectf kqxcuewrt 'f kugcugu'*4+0Vj g'r tgcrcpeg'xcnvgu'hqt 'qdguk{ 'lp'Rqtwi wvug" ej kf tgp'ctg'ctqwpf ': /; ' . 'y kj 'qxyty gli j vtgcej kpi '3: ' 'kp'ej kf tgp'cpf '46' 'hqt'cf qrguegpw" '*5+0Cp'wphcxqtcdrng'cuuqekcvkp'dgwy ggp'ugf gpvct { 'dgi cxkqt 'cpf 'dqf { 'eqo r qukkqp'r tqhkr'qh" ej kf tgp'*6.'7+.'cpf 'y kj 'i gpgtcrj gcnj 'cu'y gm'j cu'dggp'f qewo gpvgt '*8+0Rtqr gevxxg" qdugtxcvkpu'awi i guv'y cv'kpetgcukpi 'ugf gpvct { 'vko g'*UV+d { '3' . 'htqo '9'v'37' { gct'u'y cu" cuuqekcvf 'y kj 'cp'kpetgcug'lp'dqf { 'o cuu'kpf gz '*DO K'qh'2023'ni lo 4'cpf 'lp'hcv'o cuu'kpf gz 'qh' 2027'ni lo 4'*9+0Eapugs wgpv{ . 'k'j cu'dggp'cf xqecvgt 'y cv'UV'uj qwf 'dg'eqpukf gtgf 'cp" kpf gr gpf gpv'tkumhcevt 'hqt'j gcnj 'kp' { qwj . 'f kpkpev'htqo 'r j { ukcni'cevxxkv{ '*RC+'* : +0Hw'v'j gt." qdugtxcvkpcn'f cv'kpf kvcv'u'y cv'j ki j gt'o qf gtcvq/vq/xki qtqwu'RC'*O XRC+'ku'cuuqekcvf 'y kj " dgwgt'ectf kq/o gvcdqrle'tkumhcevtu'cpf 'hcvpau'r j gpqv{ r g'lp'ej kf tgp. 'tgi ctf rguu'qh'vko g" ur gpv'lp'UV'*; /35+0"

Go gti kpi 'gxlk gpeg'awi i guv'y cv'y g'y c { 'y g'ceewo wrcv'UV'o c { 'dg'o qtg'tgrxcpv' vj cp'vqcn'UV'hqt'ej kf tgp'w'j gcnj '*36.'37+'y kj 'tgegpv'kpf kpi u'awi i guv'kpi 'y cv'kpvgttwr vki " UV'cpf 'rko kkp' 'r tqm'pi gf 'dqwu'qh'UV'o c { 'dg'dgpg'hekcn'v'y gli j v'ucwu'*38.'39+.'cpf " ectf kq/o gvcdqrle'tkumh'39+0Qpg'r tgxkqwu'kpxguki cvkqp'j cu'qdugt'xgf 'cp'kpxgtug'cuuqekcvkp'hqt" vj g'pwo dgt'qh'uj qtvt'ugf gpvct { 'dqwu'*3/6'o kpwgu+'y kj 'ectf kqxcuewrt'tkumhcevtu'cpf " DO K'y j gtgcu'v'j g'pwo dgt'qh'ugf gpvct { 'dqwu'y kj 'h'pi gt'h'pi vj '*32/36'o kpwgu+'y cu'tgrcvf " vq'c'f grvgtkqwu'y ckv'ektewo hgtgpeg.'hcvkpi 'i nvequg.'cpf 'DO K*3: +0J qy gxgt.'pqp'g'qh'v'j g" r tgxkqwu'uwf kv'gzco kpgf 'y g'cuuqekcvkpu'dgwy ggp'v'j g'pwo dgt'qh'ugf gpvct { 'dqwu'y kj " xct { kpi 'h'pi vj . 'cpf 'vqcnk'cdf qo kpcn'cf kr qukv{ '*cuugu'gf 'wukpi 'c'tghgt'gpeg'o gvj qf +0"

Rewgtpu'qh'UV'cpf 'RC'j cxg'cnq'dggp'tgrcvf 'vq' { qwj }u'ectf kqtgur ktcvq { 'h'kpguu' '*ETH'*36.'3; +.'y j kv'qp'v'j g'qv'j gt'j cpf . 'h'qy 'ETH'ku'cuuqekcvf 'y kj 'cp'wphcxqtcdrng'dqf { "

eqo r qukkqp*42."43+0Vj wu."uqo g'qh'vj g'r t gxlqwu'cuuqekvqpu'tgr qtvgf 'lp'vj g'hdgtcwtg*38/
3: +tgrvki 'r cwtgpu'qh'UV'y kj 'j gcnj "cpf "dqf { "eqo r qukkqp"o c { 'j cxg'dggp"o gf kvvf "d { "
ETHOC'tgegpv'uwf { "qdugt xgf 'vj cv.'lp'cf wuu.'ETH'o gf kvvf 'vj g'r tqur gev xg'cuuqekvqpu'qh'
vpp/ { gct'ej cpi gu'lp'ugf gpvct { "dgj cxkqt'cpf "O XRC'y kj 'ej cpi gu'lp'c'ectf kq/o gxcdqre'tkum'
ueqtg.'lpenf lpi 'y ckv'ektewo hgtgpeg.'hcvkpi 'i nweqg.'j ki j /f gpuk{ 'rkr qr tqvlp*J FN"
ej qngvgtqn'tki n'egtkf gu'cpf "dnqqf 'r tguuwtg.'cpf 'y kj 'y ckv'ektewo hgtgpeg'kugth*44+0"

Tgegpv{.'lpxgtug'etquu/ugevqpcn'cuuqekvqpu'dgvy ggp'O XRC'cpf "cf kr qukv{ "
lpf kcvqtu'y gtg'hqwpf.'y j gtgcu'pq'cuuqekvqpu'y gtg'qdugt xgf 'hqt'vqcn'UV'y kj 'vj g'uco g"
qweqo gu*35+0J gtg.'y g'clo "vq'gzvppf 'vj gug'hkpf lpi u'y kj 'c"o qtg'vj qtqwi j 'wpgtuxcpf lpi "qh"
vj g'tgrvqpuj kr u'qh'r cwtgpu'qh'UV'cpf "O XRC.'y kj "vqcn'tgi kpcn'cf kr qukv{ 0Hwvj gto qtg.'y g"
r tqxkf g'c'pgy 'lpuki j v'qp'vj g'r qvppcn'o gf kvkpi 'tqrg'qh'ETH'qp'vj g'cuuqekvqpu'dgvy ggp"
r cwtgpu'qh'UV'cpf "cf kr qukv{ 'lpf gz gu'ETH'y cu'cf lwvxf 'hqt'hcv'htgg'o cuu*HHO +*45+'cu'kv'ku'
eqpukf gtgf 'vj g'dguv'gzr tguukp'qh'ETH'lp'ej kf tgp'cpf "{ qwj 0"
"

Methods

Participants

Rctvlek cpw'y gtg'tgetvkgf 'htqo 'r wdrlk'uej qqn'lp'Qgkcu'o'Rqtwi cr0Vj gug'uej qqn"
r ctvlek cvgf 'lp'c'uej qqn'dcugf 'enwvgt'tcpf qo k gf "eqpvtqmgf "vkn'*enplecn'vkn'tgi kum { <
KUTEVP98235897+'vq'gxcnvcg'vj g'ko r cev'qh'cp'lpvgtxgpvqpp'lp'ej kf j qpf "qdgukv{ "dgvy ggp"
4232'cpf "4233."cu'f guetkdgf 'r t gxlqwu{ '*35+0Vj g'r t gugpv'lp'xguki cvkqp'lpenf gf "c'uwduco r rg"
qh'555'ej kf tgp*394'i knu+'vj cv'j cf 'xcrkf 'f cv'qp'ETHOC'm'r ctvlek cpw'f'i wctf lcpu'y gtg"
lphqto gf "cdqw'vj g'clo u'qh'vj g'lp'xguki cvkqp'cpf "i cxg'y tkwgp'lphqto gf "eqpugpv'hqt'vj gk"
ej kf tgp'vq'r ctvlek cvg0Vj g'lp'xguki cvkqp'y cu'cr r tqxgf "d { 'vj g'Gvj leu'Eqo o kvwg'qh'vj g"
Hcewn{ 'qh'J wo cp'Mkpgvku.'Wpkxgtukv{ 'qh'Nkudqp.'cpf "eqpf wevgf 'lp'ceeqtfcpeg'y kj 'vj g"
Y qtrf "O gf lecn'Cuuqekvqpu'F gerctcvkqp'qh'J gnkpnk'qp'j wo cp'uwf lgu*46+0"

Dqf { 'Eqo r qukkqp'O gcuwtgu'

Rctvlekr cpw'y gtg'y gki j gf 'v'j g'pgctguv'208'ni 'y gctkpi 'o kpkc cni'emqj kpi 'cpf 'y kj qw' uj qgu'qp'cp'grgextqple'uecrg'*o qf gr'9; ; . 'Ugec.'J co dwi . 'I gto cp {+0J gki j v'y cu'o gcuwtgf " y kj qw'uj qgu'v'j g'pgctguv'208'eo '*o qf gr'442.'Ugec.'J co dwi . 'I gto cp {+.'ceeqtf kpi 'v'j g' ucpf ctf k gf 'r tqegf wtgu'f guetkdgf "gnugy j gtg"*47+0'

F wcn'gpgti { 'Z/tc { 'cduqtr vko gt { '*F Z C +*J qmji ke'Gzr mtgt/Y . 'hpc/dgco " f gpukqo gvt.'uqhy ctg'S F T'hqt'y kpf qy u'xgtukqp'3406.'Y cnj co . 'WUC +y cu'wugf 'v'guko cvg" vqcn'hc'v'o cuu'*HO +.'cdf qo kpcn'HO "cpf 'HHO 0Vqcn'hc'v'o cuu'kpf gz '*HO K'cpf 'cdf qo kpcn'HO K '*HO K_{df} +y gtg'ecrewrcv'g' d { 'f kxf kpi 'y g'vqcn'cpf 'cdf qo kpcn'hc'v'o cuu'd { 'y g'us wctg'qh'y g" j gki j v'*mi lo ⁴+0C'y j qrg/dqf { 'uecp'y cu'r gthqto gf "cpf 'y g'cwgpcv'kqp'qh'Z/tc { u'r wugf " dgy ggp'92'cpf '362'nX'u{pej tqpwun{ 'y kj 'y g'hkpg'htgs wgpe { 'hqt'gcej 'r kz gr'qh'y g'uecppgf " ko ci g'y cu'o gcuwtgf 0Cdf qo kpcn'dqf { 'hc'v'o cuu'y cu'o gcuwtgf 'y tqwi j 'r ctvkn'cpcn{ ugu'qh'y g" F Z C'uecp.'dcugf "qp'tgi kpu'qh'kpvgt gu'0Vj g'tgi kpp'qh'kpvgt gu'y cu'o ctngf "d { 'qpg'tgewpi rg." ug'v'dgy ggp'y g'wr r gt'o cti k'qh'y g'ugeqpf 'nwo dct'xgtvgdte'cpf 'y g'dqwqo 'ny gt'o cti k'qh' y g'hwtv'y 'nwo dct'xgtvgdte.'y g'ukf gu'dgkpi 'f ghkpgf "d { 'y g'eqpvkpcv'kqp'qh'y g'rcvgtcn'ko ku'qh' y g'tkd'eci g'0Hqmjy kpi 'y g'r tqveqnlhqt'F Z C'f guetkdgf "d { 'y g'o cpw'cewtgt.'c'r j cpvqo 'y kj " ukz 'hgrf u'qh'cet { nke'cpf 'cnwo kpo 'qh'xct { kpi 'y kempguu'cpf 'npqy p'cduqtr vkg'r tqr gt vku'y cu' uecppgf "cnppi ukf g'gcej 'r ctvlekr cpv'v'q'ugtxg'cu'cp'gz vgtpcn'ucpf ctf 'hqt'y g'cpcn{ ugu'qh' f khgtgpv'vkuuwg'eqo r qpgpw'0Vj g'uco g'rdqtcvqt { 'vgej plekcp'r qukkqpgf 'y g'r ctvlekr cpw." r gthqto gf 'y g'uecpu'cpf 'gz gewgf 'y g'cpcn{ ugu'ceeqtf kpi 'v'j g'qr gtcvqt'au'o cpwcn'wukpi 'y g' ucpf ctf 'cpcn{ uk' r tqveqnl'0Dcugf "qp'v'gp'r ctvlekr cpw.'y g'eqghkpgv'qh'xctk'v'kqp'k'qwt" rdqtcvqt { 'hqt'HO "cpf 'cdf qo kpcn'HO 'y gtg'30' "cpf '203' . 'tgur gev'kxgn{ 0"

Sedentary Patterns and Physical Activity

Rctvlekr cpw'y gtg'cungf "vq'y gct'cp'ceegrqtqo gvgt '*Cewki tcr j . 'o qf gnI V3O 'o qf gn"
Rgpuceqr: "Hqtkf c+'qp'vj g'tki j vj kr . 'pgct'vj g'knce'etguv'f wtkpi 'hqw'eqpugewkxg'f c { u."
kpenf kpi "y q'y ggnf c { u'cpf 'y q'y ggngpf 'f c { u'*48+0Vj g'f gkxgt { "qh'vj g'ceegrqtqo gvgtu"vq"
vj g'r ctvlekr cpw."cu'y gm'cu'vj g'kpuwewkqpu'qp'j qy "vq'y gct'vj g'f gxleg. 'y gtg'o cf g'lp'r gtuqp0'
Chgt'vj g'cuuguo gpvr gkqf . 'c'tgugctej gt'tgegkxgf 'vj g'ceegrqtqo gvgtu'f kgevn' 'htqo 'vj g"
r ctvlekr cpw0Vj g'f gxlegu'y gtg'cevkxcvgf "qp'vj g'hkuv'f c { 'cpf 'vj g'f c'v'tgeqtf gf 'lp'37/uge"
gr qej u0Y g'wugf "37/uge"gr qej u'lp"qtf gt"vq'ecr wtg'cni'ur qpvcpgqwu'r j { ulecn'cevkxk' . 'v'r kecn'
qh'ej kf tgp. 'y j kg'cnuq'cxqkf kpi "dkugf 't guwmu'htqo 'j ki j "oh'gs wge { 'uco r nkpi 'kpvgtxcnu'*49+0'
Vj g'f gxleg'cevkxcvqp'cpf 'f c'v'f qy pmqf 'cpf 'r tqeguukpi 'y gtg'r gthqto gf "wukpi 'vj g'uqhw ctg"
Cewki'Ng'ug'ng"x080202.'Cewki tcr j . 'Rgpuceqr: "Hqtkf c+0Hq'vj g'cpcn'ugu. 'c'xcnk'f c { 'y cu'
f ghkpgf 'cu'j cxkpi "x822"o kpwgu'qh'y gct'vko g0Cr ctv'htqo 'y j gp'vj g'ceegrqtqo gvgt'y cu"
tgo qxgf "g0 0unggr kpi "qt'y cvgt'cevkxkku+:'r gkqf u'qh'c'v'gcu'82/o kpwgu'qh'eqpugewkxg' gtq"
cevkxk' 'kpvgpuk' 'eqwpu'y gtg'cnuq'eqpukf gtgf "cu'pqp/y gct'vko g0Vj g'lp'xguk' c'v'qp'kpenf gf "
vj g'tguwmu'htqo 'r ctvlekr cpw'y kj "c'v'gcu'vj tgg'xcnk'f c { u'*kpenf kpi "y q'y ggnf c { u'cpf 'qpg"
y ggngpf 'f c { +0"

Vq'f gygto kpg'vj g'o gcp'vko g'lp'gcej 'cevkxk' 'kpvgpuk' '*ugf gpvct { . 'hki j v'cpf "O XRC+ "
y g'wugf "ewqhh'xcn'gu'cu'hqm'y u'UV">"322"eqwpu'r gt'o kpwg'*er o =hki j v'322/44; 7"er o = "
O XRC"x44; 8"er o "4: +0C'ugf gpvct { "dqw'y cu'f ghkpgf 'cu'c'eqp'kpwwo 'r gkqf 'y j gtg'vj g'er o "
y gtg'dgm'y "3220Hq't'gcej 'r ctvlekr cpw.'vj g'pwo dgt'qh'ugf gpvct { "dqwu'rcukpi "3/6.'7/; ."32/36."
cpf "x37"o kpwgu'y gtg'ecrew'v'gf 0Dgecwug'UV'ku'j ki j n' "eqttgr'v'gf 'y kj 'ugf gpvct { "dqwu'qh"
xctkgf 'hpi vj u.'cpf "vq'cxqkf "o w'keqnk'pgetk' 'lp'vj g'o qf gnu.'y g'cf lwugf 'gcej 'ugf gpvct { "dqw'
kpf kkf wcn' 0Ugf gpvct { "dqwu'y gtg'tgi tguugf "qp'UV'cpf 'y gct'vko g.'cpf 'vj g'wpucpf ctf k' gf "
tgu'f wcn'uwo o gf "vq'vj g'o gcp'*ugf gpvct { "dqwu+'y gtg'wugf 'lp'vj g'cpcn'ugu0C'uko krc' "
r tqegf wtg'y cu'r gthqto gf "vq'cf lwu'v'q'cn'UV'vq'y gct'vko g0C'dtgcni'lp'ugf gpvct { "vko g'*DUV+ "
y cu'eqpukf gtgf "cu'cp'kpvgttw'v'qp'qh'UV'y kj "c'v'gcu'3/o kpwg'f w'c'v'qp. 'lp'y j kej 'vj g'eqwpu"

tgi kxgtgf "d{ 'y g'ceegrtqo gvg'tqug'cdqyg'y g'y tguj qnf "qh'322'er o 0Vj g'pwo dgt'qh'DUV"
y cu'f kxkf gf "d{ 'y g'pwo dgt'qh'j qwtu'kp'UV*DUVIUV+'cpf 'y ku'xctkcdng'y cu'wugf 'kp'y g"
cpcn{ uku'Wukpi 'y ku'tcvkq'kpugcf "qh'qvcn'dtgcni'cmqy u'wvf gtucpf kpi 'y g'pwo dgt'qh'
kpgttwv vkpu'hqt'gcej 'j qwt'ur gpf 'ugf gpvct { 0

"

Cardiorespiratory Fitness

" ETH'y cu'kpf ktgevn{ 'f gvgto kpgf "d{ "c'o czko cn'gti qo gvg't'e{eng'vguv'y ky 'r tqi tguukxgn{ "
kpetgculpi 'y qtmqcf "wukpi "cp"grgevtqplecm{ "dtcnf "gti qo gvg't "O qpctm: 4: "G'Gti qo gf le="
O qpctm"Uy gf gp+0Kkkn'cpf 'kpetgo gpvny qtmqcf u'y gtg'42"Y 'hqt'ej kf tgp'y gli j kpi ">52"
mi "cpf "47"Y 'hqt'ej kf tgp"×52"mi "4; +0Vj g'y qtmqcf 'y cu'kpetgcugf "gxgt { "5/o kpwgu'wpkly' g"
r gcn'ghqtv'qh'y g'r ctvkr cpw'y cu'tgcej gf 0J gctv'tcvg'y cu'tgeqtf gf "eqpvkpwqun{ "Rqmt"
Grgextq"Q{. "Hkrcpf +'y tqwi j qw'y g'vgu'0Etkgtk'f ghkpgf "hqt"o'r gcn'ghqtv'y gtg'j gctv'tcvg"
@: 7"dr o "qt'y g'uwdlgevxg'lwf i o gpv'd{ 'y g'qdugt'xgt'y cv'y g'r ctvkr cpv'eqwf "pq"tupi gt"
eqpvkpwg."gxgp"chgt"gpewtci go gp'0Rgcn'r qy gt'qwr w'cpf 'r gcn'qz { i gp'eqpuwo r vkp"
*o nlo kp+'y gtg'ecrewv'gf "ceeqtf kpi "v'y g'hqto wru'd{ "J cpugp"gv'cn'52+0Vj g'vgu'j cu'dggp"
r tgxkqun{ 'xcrkf cvgf "ci ckpu'f ktgev'o gcuwtgo gpv'qh'r gcn'qz { i gp'eqpuwo r vkp"4; +0Rgcn'
qz { i gp'eqpuwo r vkp'y cu'pqto crk gf "d{ "HHO "o nlni lo kp+'cpf 'vgt'o gf "ETH'htqo "j gtg'qp"
45+0"

Statistical Analysis

F cv'cpcn{ ugu'y gtg'r gthqto gf "wukpi "KDO "URUU"Uvcvukku'xgtukp"44Q."4235"URUU"
kpe0"cp'KDO "Eqo r cp{. "Ej keci q. "Kkpkku."WUC +0F guetk vxg'ucvukku'kpenf kpi "o gcpu±"UF "
y gtg'ecrewv'gf "hqt'cm'qweqo g'o gcuwtgo gpw'0Eqo r ctukpu'dgy ggp"ugz gu'y gtg'r gthqto gf "
wukpi 'kpf gr gpf gpv'uco r ng'V/vgu'qt'y g'pqp/r ctco gtle'O cpp/Y j kpg{/Y kreqz qp'cr r tqcej 0'
Rgctukp'eqttgr'vkpu'y gtg'eqpf wv'gf "v'xgtkh{ 'y g'tgr'vkp'dgy ggp'ceegrtqo gvg't'xctkcdngu'

"

O gf kcvkp'cpcn{uku'y gtg'eqpf wevgf 'ugr ctvcgn{ 'y kj 'y g"PROCESS"URUU'o cetq"x40'
380"6"o qf grf6+"53+0Vj ku'o cetq'cpcn{ ugu'y g'uki pkkcpeg'qh'vcn'cpf 'ur gekke'lpf kgev'
ghgew'wulpi "dqquwter 'r tqegf wtgu"*t guco r npi "qh'7.222"dqquwter 'uco r ngu'y cu'wugf +.'y j kej "
f q'pqv'tgs vktg'cuuwo r vqpu'qh'pqto crkv{ 'qh'y g'uco r npi 0Hqt'ETH'o gf kcvkp'cpcn{ uku'y g'htuv'
vugvf 'y g'vcn"*path c'+cpf 'f kgev"*path c '. 'y kj 'ETH'cf lwuwo gpv+"ghgev'dgy ggp'Z"*UV"
r cwgtpu'cpf 'RC"xctkcdngu'+cpf 'l "HO Kcpf 'HO Kdf+'v'wvf gtucpf 'kh'y gtg'y cu'cp'cuuqekcvkp"
qh'UV'r cwgtpu'cpf 'RC'y kj 'cf kr qukv{ "Hki wtg'3C+0Chgt.'y g'cpcn{| gf "path a"*y g'ghgev'qh'Z "
qp'ETH'+cpf 'path b"*y g'ghgev'qh'ETH'qp'l . "gzemf lpi 'y g'ghgev'qh'y g'Z+0ETH'o gf kcvkp"
ghgew'y gtg'f guetkdgf 'd{ 'ecrwwcvpi 'y g'ghgev'tcvku'y j kej "gzt guu'y g'co qwpv'qh'y g'vcn'
ghgev'y cvku'gzr ncpkf 'd{ 'y g'lpf kgev'ghgev'xk'y g'o gf kcvqt"*ETH+0Cm'tgr qtvgf "eqghkekpwu"
ctg'wpuwcpf ctf k gf 'cpf 'cf lwugf 'hqt'O XRC"*gzegr v'y j gp'gzr quwtg+.'ugz'cpf 'ci g"*o qpj u+0'
Ucvkckcni'uki pkkcpeg'y cu'ugv'cv'7' 0'

Results

F guetkr vxg'ej ctcevgtkne'u'qh'y g'r ctvlekr cpw'ctg'r tgugpvf 'lp'Vcdng'3.'hqt"dqj 'ugz gu'
cpf 'hqt'y g'qxgtcm'uco r ng0Ej krf tgp'y gtg'ecvgi qtk gf 'cu'qxgty gli j v'cpf "qdgug'ceeqt f lpi 'vq"
y j g'Y qtrf 'J gcnj 'Qti cpk cvkp'etkgtk"*54+0Rtgcxcrpeg'qh'ej krf tgp'y j q'o gv'tgeqo o gpf gf "
ngxgn'qh'82"o lpxwgulf c{ "qh'O XRC"ctg'cnuq'r tgugpvf "*55+0"
"

, , "VCDNG'3'J GTG", , "

"

Vcdng'4'uj qy u'y g'dlxctkv'eqttgrcvkpu'dgy ggp'wpcf lwugf "ceegrtqo gvt'xctkcdngu'
Ugf gpvct { 'ko g'y cu'lpxgtugn{ 'cuuqekcvf 'y kj 'O XRC"*?/2062.'r >2023+'cpf "DUVIUV"/2009."

"

:"

r>2023+cpf 'r quklxgn{ 'tgrvxf 'vq'vj g'pwo dgt'qh'ugf gpvct { "dqwu'qh'cm'hgpi vj u"*t×2086="

r>2023+0"

"

, , "VCDNG"4"J GTG", , "

"

" Hki wtg'3'uj qy u'vj g'tguwmu'hqt'vj g'o gf kcvkqp'cpcn{ uku0Vj g'pwo dgt'qh'uj qt'vt'ugf gpvct { " dqwu'*3/6'o kpwgu+*Hki wtg'3D+cpf 'O XRC"*Hki wtg'3J +y gtg'kpf gr gpf gpw{ "cpf 'pgi cvkxgn{ " cuuqekcvgf 'y kj 'dqvj 'vqcn'cpf 'cdf qo kpcn'HO K*path c, total effects+ 'y j krg'r quklxg" cuuqekcvkpu'y gtg'qdugt'xgf 'hqt'qpi gt'ugf gpvct { "dqwu'*7/; .32/36."cpf "×37"o kpwgu+*Hki wtg" 3E."3F."cpf "3G+0DUVIUV"cpf 'vqcn'UV'y gtg'pqv'cuuqekcvgf 'y kj 'HO Kcpf 'HO Kdf '*Hki wtg'3H' cpf '3I +0'

"

, , "HK WTG"3"J GTG", , "

"

Y j gp'cpcn{ | kpi 'path a.'y g'qdugt'xgf 'vj cv'ETH'y cu'pqv'cuuqekcvgf 'y kj 'ugf gpvct { " dqwu'qh'cm'hgpi vj u.'DUVIUV.'cpf 'vqcn'UV.'kpf gr gpf gpw{ 'qh'O XRC.'ugz'cpf 'ci g0' Eqpxgtugn{ . 'y j krg'wukpi 'vj g'uco g'cf lwxo gpw.'c'r quklxg'cuuqekcvkqp'y cu'qdugt'xgf "dgy ggp" ETH'cpf 'O XRC0C'o gf kcvkqp'ghgev'd { 'ETH'y cu'qdugt'xgf 'hqt'ugf gpvct { "dqwu'qh'3/6" o kpwgu'y kj 'HO K'ugf gpvct { "dqwu'7/; 'o kpwgu'y kj 'HO Kdf.'cpf 'ugf gpvct { "dqwu'×37" o kpwgu'cpf 'O XRC'y kj 'dqvj 'cf k'qukv{ 'kpf gz gu'*r >2027+0Vj g'tcvkq'qh'cp'kpf kt'gev'vq'c'vqcn' ghgev'qh'Z '*O XRC'cpf 'ugf gpvct { "dqwu+'qp'['*HO K'xctkgf "dgy ggp'90' '*hqt'ugf gpvct { " dqwu'qh'3/6"o kpwgu'y kj 'HO K'vq"340' '*hqt'O XRC'y kj 'HO K0Hqt'vj g'cuuqekcvkpu'y kj " HO Kdf 'vj g'ghgev'xctkgf "dgy ggp'90 ' 'hqt'ugf gpvct { "dqwu'qh'7/; 'o kpwgu.'vq'350 ' 'hqt' ugf gpvct { "dqwu'×37"o kpwgu0"

"

; "

Hli wtg"4"uwo o ctkt gu'vj g'tguwmu'hqt'vj g'f k ge vkqp"qh'vj g'cuuqekcvkqpu'qh'ugf gpvct {" r cwgtpu'cpf "O XRC."y kj "cf kr qukv{ 'r j gpqv{ r gu."cpf "vj g'tguwmu'qh'vj g'o gf kvvkqp"cpcn{ uku' Qxgtcm'y g'qdugt xgf "vj cv'ETH'o gf kvvgf "vj g'cuuqekcvkqpu'qh'ugf gpvct {"dqwu"*3/6"cpf "x37" o kpwgu+cpf "O XRC"y kj "HO KQHqt"HO Kdf."ETH'o gf kvvgf "vj g'cuuqekcvkqpu'qh'ugf gpvct {" dqwu"*7/; "cpf "x37"o kpwgu+cpf "O XRC0"

"
"

, , "HK WTG"4"J GTG", , "

"

Discussion

Qwt'tguwmu'uwi i guv'vj cv'O XRC"cpf "vj g'pwo dgt"qh'uj qtvg't'ugf gpvct {"dqwu"*3/6" o kpwgu+ctg'hcxqwtcdn{ 'tgrv'gf "vq"rjy gt'rgxgn'qh'vqcn'cpf "cdf qo kpcn'cf kr qukv{ 0E qpxgtugn{ ." ceewo wrcv'kpi "ugf gpvct {"dqwu'qh'j' ki j gt'rgpi vj "*"7/; ."32/36."cpf "x37"o kpwgu+ctg'cuuqekcv'gf " y kj "j ki j gt'cf kr qukv{ ."tgi ctf rguu'qh'O XRC0Vqcn'UV"cpf "DUVIUV'y gtg'pq'cuuqekcv'gf "y kj " vqcn'cpf "cdf qo kpcn'hcv'o cuu0O gf kvvkqp"cpcn{ ugu'uwi i guv'vj cv'ETH'o gf kvvgu'vj g'cuuqekcvkqpu" qh'O XRC"cpf "vj g'pwo dgt"qh'ugf gpvct {"dqwu"y kj "cf kr qukv{ 'kpf gz gu0J qy gxgt."y ku" o gf kvvkqp'gh'gev'y cu'qpn{ "qdugt xgf "hqt"ugf gpvct {"dqwu"*3/6"cpf "x37"o kpwgu+cpf "O XRC" y kj "HO K"cpf "ugf gpvct {"dqwu"*7/; "cpf "x37"o kpwgu+cpf "O XRC"y kj "HO Kdf0Vj gug'tguwmu" tckug'cy ctgpguu'vq'vj g'ko r qtvpeg"qh'gpi ci kpi "kp'tgi wrct'r j { ukecn'ce'vkv{ "vq'ko r tqxg'ETH" y kj "c"eqpugs wgpv'ko r cev'qp'cf kr qukv{ 0P qy kj uvc'p'kpi ."cxqkf kpi "rjpi gt'r g'kqf u'kp"UV"o c{ " cnq"dg'tgrxcpv'hqt"c'hcxqwtcdng'cf kr qukv{ 'r tqh'kg0'

Eqpegtpu'cdqwe'j kf j q'qf "qdgu'kv{ 'j cxg'dggp'i tqy kpi "kp'vj g'r cu'f'gecf gu'tgi ctf kpi " vj g'r quukdkkv{ 'qh'ch'ge'v'kpi "vj g'uvcdk'kv{ "qh'vj g'j' gcnj "ectg'u{ ugo ."r ctv'kw'w'ctn{ "y j gp'v'cn'kpi " kp'v'ceeqwp'vj cv'cf kr qukv{ 'kpetgcugu'y kj "ci g"*3+0Y kj kp'vj g'f k'ht'gp'v'cf kr qukv{ 'r j gpqv{ r gu." cdf qo kpcn'cf kr qukv{ 'j cu'dggp'utqpi n{ 'tgrv'gf "vq"r'ht'gp'v'ectf kqxcue'w'ct"cpf "o gwcd'q'ke't'kuni"

"
"

hcevtu*56+0Qwt'etquu/ugevkpncf cvc'uwi i guwu'c'hcxqtcdrq'cuuqekvqp'dgy ggp'uj qtv'
ugf gpvt { "dqwu*3/6'o kpwgu+cpf "qvcncdf qo kpcn'cf kr qukv{ .cpf 'y cv'upi gt'ugf gpvt { "dqwu"
o c { "dg'f grvgtkqu'hqt'cf kr qukv{ 'r tqhkg0Vj gug'qdugtxcvkpu'eqttqdtcvg'"r tglkqu'hkpf kpi u"
*3: + 'kp'y j lej 'ugf gpvt { "dqwu'kucvki "3"vq'6'o kpwgu'y gtg'cuuqekvqf 'y kj 'c'my gt'ectf kq/
o gvcdrke'tkum'cpf "DO K'Uko kct'vq'qwt'hkpf kpi u.'y gug'cwj qtu'cuq'qdugt xgf 'y cv'upi gt"
ugf gpvt { "dqwu'y gtg'cuuqekvqf 'y kj 'c'j ki j gt"DO K'cmj qwi j "qpn{ 'kp"dq { u*3: +0Vqi gj gt."qwt"
kpxguki cvkqp'uwducpvkvgu'y g'j { r qj guku'y cv'ej kftgp'y j q"ceewo wrcvg"UV'kp'uj qtvtg'r gtkqf u"
o c { 'r tguqpv'dgpghkcn'cf kr qukv{ 'r j gpqv{ r gu0'

Rquukdrq'o gej cpkuo u'y cv'o c { "gzn rkp'y g'tqng'qh'uj qtvtg'ugf gpvt { "dqwu'hqt'c'dgwtg"
cf kr qukv{ 'r tqhkg'o c { "dg'tgrvqf "vq'c"eqpvtkwkqp'qh'uj qtvtg'ugf gpvt { "dqwu'vq'j ki j gt'ngxgnu"
qh'qxgtcm'r j { ulecn'cevkxkv{ "cpf 'y wu'c'pgi cvkxg'gpgti { "dncpeg0k'cf wmu.'kv'j cu'dggp"
r tglkquw{ "qdugt xgf 'y cv'y g'vcpuklqp'htqo 'ukvki "vq'uvcpf kpi 'cpf 'tgwtp'vq'ukvki "j cf "c"
o gvcdrke'equv'qh'2054'hcnlo kp'cdqxg'ukvki . 'y j lej 'ku'j ki j gt'y j gp'eqo r ctgf "vq'lwuw"
ucpf kpi *2029'hcnlo kp+*57+0Cp'cewg'gzr gtko gpvniuwf { *58+'kpf kcvqf 'y cv'kpgttw vki "
UV'y cu'cuuqekvqf 'y kj 'f getgcugf 'ngxgnu'qh'kpuwkp*54' + 'E/r gr vk g*39' + 'cpf "dmqf "
i nweqg*9' + 'y j gp'eqo r ctgf 'y kj 'c'eqpvkpwqu'ukvki "eqpf kkp0Gxgp'cempqy ngf i kpi 'uqo g"
eqpvtkxgtukn'hkpf kpi u'tgi ctf kpi 'y g'dgpghk'qh'dtgcnkpi 'wr'ugf gpvt { "vko g'kp" { qwj *59+.'kv"
o c { "dg'j { r qj guk'gf 'y cv'ej kftgp'y j q'ur gpf 'upi gt'dqwu'kp'ugf gpvt { 'r wuwku'o c { 'r tguqpv"
j ki j gt'ngxgnu'qh'ektewr'kpi 'kpuwkp.'y j lej 'r tqo qvgu'hr qi gpguku'cpf 'hcw{ "cekf u'wr vng'd { 'y g"
cf kr qug'vkuwg.'r quukdn{ "ci i txcvki 'kpuwkp'tgukvcp'cpf 'kpetgukpi "qvcn'cf kr qukv{ *5: +0""

Eqpukvqpv'y kj 'r tglkqu'uww kgu*32.'33.'36.'5; .62+'c'pgi cvkxg'tgrvqpuj kr 'dgy ggp"
O XRC'cpf 'cf kr qukv{ 'y cu'qdugt xgf 0Cf f kkpccm{ . 'y g'f k'pqv'qdugt xg'cp'cuuqekvqp'dgy ggp"
qvcn'UV'cpf 'cf kr qukv{ . 'y j gp'cf lwuwkpi 'hqt'O XRC0C'uko kct'tgpf 'y cu'qdugt xgf 'kp'c"
u{ygo cvk'tgxky *63+.'j qy gxgt.'ur gekkle'ugf gpvt { "dgj cxkqtu'uwej 'cu'VX/xky kpi "o ki j v'dg"

cuuqekcvgf 'y kj 'cf kr qukv{. 'tgi ctf nguu'qh'vqcnr' j {ukecn'cevkxkv{. 'y j kej 'ecp'dg'g'zr rckp'gf 'd{'
tgukf wcn'eqphqwpf kpi '*63+0"

Rcwtgtpu'qh'UV'cpf 'O XRC' o c { 'kphwpgpeg'ETH'kp" {qwj '*36.'3; +0'Qp'vj g'qyj gt'j' cpf ."
ETH'j' cu'cuuq'dggp'tgrcvgf 'vq'cf kr qukv{ '*42.'43+0'k'p' hcev.'kv'j' cu'tgegpw{ 'dggp' uwi i guvgf 'vj cv'
ETH'o gf kcvgu'vj g'cuuqekcvkpu'qh'UV'cpf 'O XRC' y kj 'dqf { 'hcvpguu'kp'cf wmu'*64+.'cu'y gni'cu"
vj g'cuuqekcvkpu'dgy ggp'O XRC'cpf 'o gvcdqre'u{ pf tqo g'tkuni'hcevqtu'kp'ej kf tgp '*65+0'Qw"
hkf kpi u'gzv'gf 'vj g'r'tgxkqu'tguwmu'hqt'cf kr qukv{. 'd{ 'uwi i guv'kpi 'hqt'vj g'hktuv'klo g'vj cv'ETH'
o gf kcvgu'vj g'cuuqekcvkpu'dgy ggp'ugf gpvct { 'dqwu'qh'f khtgtpv'rgpi vj u'cpf 'vqcnlt'gi kqpcn'
cf kr qukv{ 'kp'ej kf tgp'0'Vj ku'o gcpu'vj cv'UV'r cwgtpu'cpf 'O XRC' o c { 'dg'cuuqekcvgf 'y kj "
cf kr qukv{. 'kp'r'ctv'f wg'vq'ku'cuuqekcvkpu'y kj 'ETH'0'hqt'kpucpeg.'ETH'g'zr rckp'gf '33' 'cpf "
36' 'qh'vj g'cuuqekcvkpu'qh'hqpi gt'ugf gpvct { 'dqwu'*@7'o kpwgu+'y kj 'dqyj 'HO K'cpf 'HO K'af ."
tgur gev'kxgn{ '*Hki wt'g'4+0"

Vj gtg'ku'c'r qv'p'v'cnlt'gcuq'p'vj cv'g'zr rckp'u'qwt'tguwmu'tgi ctf kpi 'vj g'o gf kcvkpu'gh'gev'hqt"
vj g'cuuqekcvkpu'dgy ggp'vj g'uj qt'vgt'cpf 'r tqm'pi gf 'ugf gpvct { 'dqwu'y kj 'HO K'0'Vj g'pwo dgt'qt"
htgs w'p'e { 'qh'dqwu'qh'3/6'o kpwgu'ku'o wej 'j ki j gt. 'y j gp'eqo r ctgf 'vq'vj g'qyj gt'dqwu'
ecv'gi qt'kgu.'o gcp'kpi 'vj cv'vj gtg'ku'o qtg'qr r qt'w'p'kv{ 'hqt'vj g'ETH'vq'o gf kcv'g'r'ctv'qh'vj g'
cuuqekcvkpu'y kj 'HO K'0'Qp'vj g'qyj gt'gp'f . 'r tqm'pi gf 'dqwu'*@7'o kpwgu+'gp'v'cnlt'gt'kf u'qh'
eqp'v'p'w'qwu'ugf gpvct { 'vko g'vj cv'ecp'i q'dg{ qpf '37'o kpwgu'*g'0'04'qt'5'j' qwtu+0'Vj wu.'dqyj "
qdu'gt'x'cv'k'p'cn'*66+'cpf 'g'zr gt'ko gp'v'cn'*58+'gx'kf'g'peg' uwi i guv'vj cv'ur gp'f kpi 'r tqm'pi gf 'vko g'kp"
ugf gpvct { 'r wt'uw'ku'j' cu'c'p'gi cv'x'g'ko r cev'qp'j' gcmj /tgr'cvgf 'qwe'qo gu. 'y j kej 'ku'cv'g'p'w'cv'gf "
y j gp'kp'v'gt'tw'v'gf 'o qtg'htgs w'p'w'v'0'Vj g'hcev'vj cv'ETH'o gf kcv'gf 'vj g'cuuqekcvkpu'dgy ggp'vj gug"
r tqm'pi gf 'dqwu'cpf 'HO Ky cu'u'qo gj qy 'g'zr gev'gf . 'f wg'vq'vj g'j ki j gt'j' gcmj 'tkun'icuuqekcvgf "
y kj 'vj gug'dqwu'0'H'k'p'cm{ . 'vj gtg'y cu'p'q'o gf kcv'kpu'gh'gev't'gi ctf kpi 'vj g'dqwu'ecv'gi qt'kgu'qh'7/; "
cpf '32/36.'r tqd'cdn{ 'd'ge'cw'ug'vj g{ 'j cf 'c'o wej 'h'qy gt'htgs w'p'e { . 'cpf 'vj g{ 'f q'p'q'v'eqo r tqo ku'g'
ej kf tgp'w'j' gcmj 'kp'vj g'uco g'y c { 'cu'h'qpi gt'dqwu'f'q0"

Qw'etquu/ugevkapcnf'cvc'i gpgtcvgu'yj g'j { r qvj guku'yj cv'ej kf tgp'y j q'ceewo wrcv'ugf gpvct { "
dqwu'qh'iqpi gt'ngpi yj *10x37'o kpwgu+'o c { 'j cxg'c'o qtg'hcxqtcdrng'cf kr qukv { 'r tqhkr. 'h'ETH'
ngxgu'ctg'j ki j 0Qp'yj g'qyj gt'gpf. 'ej kf tgp'y j q'ceewo wrcv'uj qtvt'ugf gpvct { "dqwu'*3/6"
o kpwgu+'dw'y kj 'ny 'ETH'xcnngu.'o c { 'j cxg'cp'wphcxqtcdrng'cf kr qukv { 'r tqhkr. 'dw'qpn { 'hqt "
vqcnf'cf kr qukv { 0'k'c'32/ { gct'hqmy /w 'uwf { 'k'cf wnu.'ugr/tgr qtvgf 'kpetgcugu'k'O XRC'cpf "
f getgcugu'k'UV'tguwngf 'k'ko r tqxgf 'ETH'y j lej 'y cu'tgrv'gf 'v' dgpgh'ekcn'gh'gevu'qp'ectf kq/
o gxcdqk'j gcmj *53+0Qw'hkf kpi u'eqttqdtcv'vj ku.'cu'y g'qdugt'xgf 'y cv'yj g'cuuqek'v'kpu"
dgwy ggp'O XRC'cpf 'UV'r cwgtpu'cpf 'cf kr qukv { 'ctg'r ctv' { 'o gf kv'gf "d { 'ETH'

Cu'hct'cu'DUV'cpf 'UV'ctg'eqpegt'pgf. 'y g'qdugt'xgf 'pq'cuuqek'v'kpy kj 'cf kr qukv { "
y j lej 'eqvt'cf lew'r t'gxl'kw'hkf kpi u'uj qy kpi 'cp'wphcxqtcdrng'cuuqek'v'kpy'ht'UV'y kj "
cf kr qukv { 'k'ej kf tgp'*6. '7. '9+0'J qy gxgt. 'y g'r t'gugp'v't'guw'nu'ctg'k'cee'qtf'c'peg'y kj 'y qug'ht'qo "
c't'gegp'v'o gvc/cpcn { uku'yj cv'uw' i guw'iko kgf 'gxkf'gpeg'ht'cp'cuuqek'v'kpy'dgwy ggp'UV'cpf "
cf kr qukv { 'k' { qwj *59+0H'qo 'y g'uco g'o gvc/cpcn { uku.'kpen'f'kpi 'f'cvc'ht'qo 'ukz'uwf'kgu "
cpcn { | kpi 'y g'cuuqek'v'kpy'qh'DUV'y kj 'cf kr qukv { . 'qpn { 'qpg'uwf { *3: +'uw' i guw'gf 'cp'cuuqek'v'kpy "
dgwy ggp'DUV'cpf 'cf kr qukv { . 'cmj qwi j 'r ct'v'ekr'cpw'k'vj ku'uwf { 'cm'j cf 'c'hc'o kn'j kuvt { 'qh' "
qdgu'k'0"

Vj g'ut'gpi yj u'qh'q'w'k'px'gu'ki'cv'kpy'kpen'f'g'c't'gr'v'k'gn' { 'rcti'g'uco r ng'uk' g'qh'ej kf tgp. "
kpen'f'kpi 'qdl'ge'v'k'gn' { 'cuugu'gf 'r j { u'ec'n'c'v'k'k'v' { . 'y j lej 'u'wdu'cp'v'k'cm' { 't'gf'wegu'yj g'h'ng'kj q'qf 'qh' "
o ku'ercu'k'h'ec'v'k'py'd'ku'0H'w'yj gto qtg.'F Z C'ue'cpu'r tqxkf g'c'o qtg'xc'rk' { 'o gcuwt'go gpv'qh' "
cf kr qukv { . 'y j gp'eqo r ct'gf 'v' { 't'cf'k'k'q'pcn'c'pyj tq'qo g'v'le'o gcuwt'go gpw. 'cpf 'r tqxkf gu'wu'y kj "
HHO' { 'o gcuwt'go gp'0Vj ku'cmjy gf 'wu'v'q'p'qto'cn'k' g'ETH'xcnngu'w'k'pi 'HHO. 'cu'c'r tqz { 'qh' "
qz { i gp'eqpuwo r v'k'py'q'p'yj g'o gxcdqk'ecm' { 'ce'v'k'g'o cu'0Vj g'r t'gugp'v'k'px'gu'ki'cv'k'py'cnu'j'cu' "
uqo g'iko'k'cv'k'py'vj cv'y ct'tcp'v'f'ku'ewu'k'py'0H'q'k'p'uc'peg. 'y g'etquu/ugevkapcn'p'cwt'g'qh'yj ku' "
k'px'gu'ki'cv'k'py'iko ku'r qu'k'd'ng'k'ph'gt'g'pegu'qh'ec'w'uc'rk'v' { 0Vj wu. 'y g'f'k'g'v'k'py'qh'yj g'qdugt'xgf "
cuuqek'v'k'py'ecpp'q'v'dg'gu'w'd'rkuj gf 'cpf' { 'o c { 'dg'dk'f'k'g'v'k'py'c'0'0' qt'g'q'x'gt. 'c'ect'gh'w'

kpvgtr tgvckqp'ku'y cttepvf 'tgi ctf kpi 'vj g'o gf kvkqp'cpcn{uku.'ukpeg'c'xctkcdrg'yj cv'ku'hqwpf 'vq'
dg'c'utqpi 'o gf kvqt'kp'c'etquu/ugevckpcn'cpcn{uku'o c{ 'pqv'dg'c'o gf kvqt'cv'cm'kp'c'
rpi kwf kpcn'cpcn{uku'67+0Vj g'r ctvckr cpw'y gtg'tguktlevf 'vq'ej kf tgp'ci gf "; 'vq'33" { gctu'qrf ."
cpf 'vj gtghqtg'yj g'tguwmu'ecppqv'dg'i gpgtck gf 'vq'ej kf tgp'qh' { qwpi gt'qt'qrf gt'ci gu0P q"
f kvct { 'tgeqtf u'y gtg'cuuguuf 'f wtkpi 'vj g'kpxguki cvkqp.'cpf 'dgecvug'dqvj "gpgti { 'gZR gpf kwg"
cpf 'ecm'le'kpcvng'chgevdqf { 'eqo r qukkqp.'qpg'ecppqv'pgi rgev'yj g'ko r qtvpeg'qh'f kvct { "
kpcvng'qp'ej kf tgp'au'dqf { 'eqo r qukkqp'0k'cf f kvkqp.'k'j cu'dggp'tgeqi pk gf 'vj cv'f khtg'gpv'v{r gu"
qh'ugf gpvt { 'r wtuwku'gfi 0uetggp'vko g+'gpvckif kvkpev'cuuqek'vqpu'y kj 'j gcmj 'r ctco gvtu."
vj wu'wukpi 'ceegrtqo gvt/tgrv'f 'ugf gpvt { 'vko g.'k'ku'pqv'r quukdr'vq'kphgt'cdqw'vj g'ko r cev'qh"
vj gug'f khtg'gpv'ugf gpvt { 'dgj cxkqtu'qp'HO K'cpf 'HO K'df 0F wg'vq'uko kgf 'cxckcdrg'eqphqwpf gtu."
vj gtg'o c { 'dg'tgukf wcn'eqphqwpf kpi 'cu'c'tguwmu'qh'wpo gcuv'gf 'xctkcdrgu.'uwej 'cu'r ctgpvcn'DO K'
dkvj 'y gki j v.'qt'vqekqgeppqo le'uvwu0"

Qw'Hkpf kpi u'awi i guv'yj cv'qvcn'UV'cpf 'DUVIUV'y gtg'pqv'cuuqek'v'f y kj 'cf kr qukv{ "
r j gpqv'r gu'y j gp'ceeqwp'kpi 'hqt'O XRC0J qy gxgt.'k'o c { 'dg'ko r qtvcpv'vq'eqpukf gt'vj g'hgpi yj "
qh'ugf gpvt { 'dqwu'lp'y j lej 'ej kf tgp'r ctvcng'yj gk'UV.'cu'y gmi'cu'yj g'vko g'ur gpv'kp'O XRC0'
Vj gug'cuuqek'vqpu'qp'f khtg'gpv'cf kr qukv{ 'r j gpqv'r gu.'ctg'r ctvckm{ 'gZR m'kpgf 'd { 'c'o gf kvkpi "
ghgevdqh'ETH0H'qo 'c'r t'gxgp'v'kp'r q'kv'qh'xkgy . 'gctn{ 'ej kf j qf 'ku'cp'ko r qtvcpv'vko g'htco g"
hqt'r t'gxgp'v'kpi 'qdgukf . 'cpf 'uj qwf 'dg'vcti gvf 'd { 'r tqi tco u'wukpi 'c'o wnk'cegv'f 'cr r tqcej "
y kj 'ur gekn'go r j cuku'qp'kpetgculpi 'ej kf tgp'au'r j { u'ekn'cev'xkv{ 'qh'j ki j gt'kpv'gukv{ 'kp'qtf gt'vq"
ko r tqxg'yj gk'ETH'gxgn0"

"

Acknowledgements

Vj ku'y qtmly cu'uw' r qtv'f 'd { 'vj g'Rqtwi wug'Hqwpf cvkqp'hqt'Uelgpeg'cpf 'Vgej pqm{ { '*I tcpv'<
RVF E IF GUB2: 594422: +0F CU.'IRO . 'cpf 'RDL'ctg'uw' r qtv'f 'd { 'c'uej qm'uj kr 'htqo 'vj g"

Rqtwi wug'Hqwpf cvkqp'hqt'Uekpeg'cpf'Vgej pqmji { '%i tcpwu/'F CU'UHTJ IDRF 1; 46844235="

LRO <UHTJ IDf 1: 79644234="RDL<UHTJ IDRF B37; 99423840'

"

Conflict of Interest

Vj g'cwj qtu'f gerctg'yj cv'yj g{ 'j cxg'pq'eqphkev'qh'kpvtgu0'Vj g'tguwmu'qh'yj g'r tgu'p'uwf { "f q"

pq'v'epukw'w'g'p'qtugo gpv'd{ 'CEUO 'cpf 'ctg'r tgu'p'v'gf 'engctn{ . 'j qpgu'w' . 'cpf 'y kj qw'

hcdt'ec'v'kp. 'hcn'k'ec'v'kp. 'qt'k'p'cr r tqr t'cv'g'f'cv' 'o c'p'k'w'v'kp0'

"

References

- 30' Uko o qpf u'O . 'Dwtej 'L'Nrgy gm{ p'C "gv'cr0'Vj g'wug'qh'o gcuwtgu'qh'qdgukv{ 'kp" ej kf j qqf 'hqt' r tgf kev'pi "qdgukv{ 'cpf 'y g'f gxgnr o gpv'qh'qdgukv{ /tgr'v'gf "f kugcugu'kp" cf wnj qqf <'c'u{ u'go c'ke't'gxky "cpf 'o g'v/c'p'cn{ uku0'Health technology assessment (Winchester, England)04237-3; *65+3/5580'
- 40' Lxqpcr'O . 'O ci puwug'EI . 'Dgt'g'pu'q'P 'U'gv'cr0'Ej kf j qqf "cf kr qukv{ . "cf w'w'cf kr qukv{ . " cpf "ectf k'x'c'ue'w'rt 't'k'um'h'c'v'qtu0'The New England journal of medicine' 4233-587*42+3: 98/: 70'
- 50' Qr'k'g't'c' . 'C't'c'w'q'L'U'g'x't'q'O "gv'cr0'Rt'g'x'c'p'eg'qh'i g'p'g't'c'n'c'p'f "c'd'f'q'o k'p'c'n'q'd'g'uk'v{ 'kp" Rqtwi c'n'eqo r t'g'j g'p'uk'g't'g'u'w'u'ht'q'o 'y'j g'P'c'v'k'p'c'n'H'q'q'f . 'p'w't'k'k'p' 'c'p'f 'r'j { u'k'c'n' c'ev'k'k'v{ 'u'w'x'g{ "4237/42380'BMC public health'0423: -3: *3+8360'
- 60' Uctf k'p'j c'ND . 'O c't's w'g'u'C . 'O k'p'f g't'k'q'E . 'G'm'g'w'p'f "W0'E't'q'u'u'g'e'v'k'p'c'n'c'p'f 'r' t'q'ur g'e'v'k'g" k'o r c'ev'q'h't'g'c'm'q'ec'v'pi "u'g'f'g'p'v'c't { "v'k'o g'v'q'r'j { u'k'c'n'c'ev'k'k'v{ "q'p'ej k'f t'g'p'u'd'q'f { " eqo r q'uk'k'p'0'Pediatric obesity'042380'
- 70' M'g'c'p'g'G . 'N'k'Z . 'J c't't'k'p'i v'q'p'LO . 'H'k'v' i g't'c'rf 'CR . 'R'g't't { "K'L'M'g'c't'p'g{ "RO'0'R'j { u'k'c'n' c'ev'k'k'v{ . "U'g'f'g'p'v'c't { "D'g'j c'x'k'q'w't' 'c'p'f 'y'j g'T'k'um'q'h'Q'x'g't'y g'k'i j v'c'p'f "Q'd'g'uk'v{ 'kp'U'ej q'q'n' C'i g'f 'E'j k'f t'g'p'0'Pediatric exercise science'04239-3/490'
- 80' E'c't'q'p'X . 'J w'p'v'g't'U . 'M'w'v' k'n'i'P "gv'cr0'U{ u'go c'ke't'g'x'ky "q'h'ug'f'g'p'v'c't { "d'g'j c'x'k'q'w't' 'c'p'f " j g'c'n'j "k'p'f k'ec'v'qtu'k'p'ue'j q'q'n'c'i g'f "ej k'f t'g'p'c'p'f { "q'w'j <'c'p'w'r f'c'v'g'0'Applied physiology, nutrition, and metabolism = Physiologie appliquee, nutrition et metabolisme'0 4238-63*8'U'w'r n'5+U462/870'
- 90' O'c'p'p'MF . 'J q'y g'NF . 'D'c'u'g't'h'k'g'f'f "N'gv'cr0'N'q'p'i k'w'f k'p'c'n'u'w'f { "q'h'y'j g'c'u'u'q'ek'v'k'p'u" d'g'y g'g'p'ej c'p'i g'k'p'ug'f'g'p'v'c't { "d'g'j c'x'k'q'w't' 'c'p'f "ej c'p'i g'k'p'c'f'k'r'q'uk'v{ "f'w't'k'p'i "ej k'f j q'q'f "c'p'f " c'f q'ng'ue'g'p'eg<'I c'v'g'uj g'c'f "O k'ng'p'p'k'w'o "U'w'f { 0'International journal of obesity (2005)'0 42390'
- : 0' E'j k'p'c'r'c'y 'O LO . 'R't'q'r'g't'M'K'D't'w'i 'L'x'c'p'O g'ej g'r'g'p'Y . "U'k'p'i j "CU'0'T'g'r'v'k'p'uj k'r " d'g'y g'g'p' { "q'w'p'i 'r'g'q'r'ng'u'ug'f'g'p'v'c't { "d'g'j c'x'k'q'w't' 'c'p'f "d'k'q'o g'f k'ec'n'j g'c'n'j "k'p'f k'ec'v'qtu'<'c' u{ u'go c'ke't'g'x'ky "q'h'r't'q'ur g'e'v'k'g'uw'f l'g'u'0'Obes Rev'04233-34*9+G843/G540'
- ; 0' M'y'q'p'U . 'D'w't'p'u'VN . 'N'g'x { 'UO . 'L'c'p'i "M'HO'Y j k'ej "eq'p'v'k'd'w'g'u'o q't'g'v'q'ej k'f j q'q'f " c'f'k'r'q'uk'v{ /j k'i j "h'g'x'g'n'u'q'h'ug'f'g'p'v'c't'k'uo "q't'h'q'y "h'g'x'g'n'u'q'h'b'o q'f g't'c'v'g'v'j t'q'w'i j /x'k'i q't'q'w'u" r'j { u'k'c'n'c'ev'k'k'v{ A'V'j g'K'q'y c'D'q'p'g'F g'x'g'n'r o g'p'v'U'w'f { 0'The Journal of pediatrics'0 4235-384*8+338; /960'

"

- 320 Ej cr w'IR.'Nco dgtv'O . 'O cyj lgv'O G.'Vtgo drc { 'O U.'L'QN.'Vtgo drc { 'C0Rj { ulecn' cevxxk\ 'xu0ugf gpvct { 'vko g<lpf gr gpf gpv'cuuqekvqpu'y kj 'cf kr qukv\ 'kp'ej krf tgp'0 *Pediatric obesity*04234-9*5+473/: 0'
- 330 Gngnwpf 'W.'Nwcp'L'Uj gtct'ND'gv'crl'O qf gtcvg'vq'xki qtqwu'r j { ulecn'cevxxk\ 'cpf " ugf gpvct { 'vko g'cpf "ectf kqo gvcdrke'tkuml'cevqtu'lp'ej krf tgp'cpf "cf qrguegpw'0 *JAMA : the journal of the American Medical Association*04234-529*9+926/340'
- 340 Eqmki u'RL'Y guv'cwg'M'Xckuv'L'gv'crl'O'Etquu/Ugevkqpcn'Cuqekvqpu'qh'Qdlgevkgn\ / O gcuwgf 'Rj { ulecn'cevxxk\ 'cpf "Ugf gpvct { 'vko g'y kj 'Dqf { 'Eqo r qukv'cpf " Ectf kqtgur ktcvqt { 'Hkpguu'lp'O kf /Ej krf j qqf <Vj g'RCP KE'Uwf { 0 *Sports medicine (Auckland, N.Z.)*04239-69*6+98; /: 20'
- 350 O cts wgu'C.'O kpf gtleq'E.'O ctvku'U.'Rcm gktc'C.'Gngnwpf 'W.'Uctf kpj c'ND'0'Etquu/ ugevkqpcn'cpf 'r tqur gevkg'cuuqekvqpu'dgy ggp'o qf gtcvg'vq'xki qtqwu'r j { ulecn'cevxxk\ " cpf "ugf gpvct { 'vko g'y kj 'cf kr qukv\ 'kp'ej krf tgp'0 *International journal of obesity (2005)*0 4238-62*3+4: /550'
- 360 Lxf leg'RD.'Ukrxc'CO . 'Dgttk'L'Rgtqunk'GN.'Gngnwpf 'W.'Uctf kpj c'ND'0'Ugf gpvct { " r cwtgtpu.'r j { ulecn'cevxxk\ "cpf "j gcnj /tgrcvf 'r j { ulecn'hkpguu'lp' "{ qwj <c'etquu/ ugevkqpcn'uwf { 0 *The international journal of behavioral nutrition and physical activity*04239-36*3+470'
- 370 Dckrg { 'FR.'Ej cto cp'UL'Rnqyv 'V.'Ucxqt { 'NC.'Mgtt'EL'0'Cuqekvqpu'dgy ggp" r tqmki gf "ugf gpvct { 'vko g'cpf "dtgcm'lp'ugf gpvct { 'vko g'y kj "ectf kqo gvcdrke'tkuml'p" 32/36/ { gct/qrf "ej krf tgp<Vj g'J CRR\ 'uwf { 0 *Journal of sports sciences*04238-3/: 0'
- 380 Ectuqp'X.'Uqpg'O . 'Hwmpgt'I 0'Rcwtgtpu'qh'ugf gpvct { "dgj cxkqt"cpf "y gli j v'ucwu" co qpi "ej krf tgp'0 *Pediatric exercise science*04236-48*3+7/3240'
- 390 Eqmg { 'TE.'I cttki wgv'F.'Lcpuugp'Kgv'crl'Vj g'cuuqekvqpu'dgy ggp'ceegrgtqo gvg/ o gcuwgf 'r cwtgtpu'qh'ugf gpvct { 'vko g'cpf "j gcnj 'tkuml'p'ej krf tgp'cpf " { qwj <t'guwmu" htqo "vj g'Ecpcf kcp'J gcnj 'O gcuwgu'Uwxg { 0 *BMC public health*04235-35-4220'
- 3: 0 Ucwpf gtu'VL'Vtgo drc { 'O U.'O cyj lgv'O G'gv'crl'O'Cuqekvqpu'qh'ugf gpvct { "dgj cxkqt." ugf gpvct { "dqwu'cpf "dtgcm'lp'ugf gpvct { 'vko g'y kj "ectf kqo gvcdrke'tkuml'p'ej krf tgp" y kj "c'hc'o kn\ "j kvqt { "qh'qdgukv\ 0 *PloS one*04235- *33+9; 3650'
- 3: 0 Ucpvu'T.'O qc'L'Qngn\ 'CF'gv'crl'Vj g'lpf gr gpf gpv'cuuqekvqpu'qh'ugf gpvct { " dgj cxkqt"cpf "r j { ulecn'cevxxk\ "qp'ectf kqtgur ktcvqt { 'hkpguu'0 *British journal of sports medicine*04236-6: *42+372: /340'
- 420 Cpf gtugp'ND.'Uctf kpj c'ND.'Htdgti 'M'Tkf f qej 'EL'Rci g'CU.'Cpf gtugp'UC'0'Hkpguu." hcvguu'cpf "enwvgtkpi "qh'ectf kqxcuewrt'tkuml'cevqtu'lp'ej krf tgp'htqo 'F gpo ctm" Guvplc'cpf "Rqtwi cn'vj g'Gwtqr gcp' [qwj 'J gctv'Uwf { 0 *International journal of pediatric obesity : IJPO : an official journal of the International Association for the Study of Obesity*0422: -5"Uwr r n'3-7: /880'
- 430 Qtprgu'TV.'Ukrxc'CO . 'O kpf gtleq'E U.'Uctf kpj c'ND'0'Ej cpi gu'lp'ectf kqtgur ktcvqt { " hkpguu'r tgf lev'ej cpi gu'lp'dqf { "eqo r qukv'htqo "ej krf j qqf "v'cf qrguegpeg<h'lpf kpi u" htqo "vj g'Gwtqr gcp' [qwj 'J gctv'Uwf { 0 *The Physician and sportsmedicine*0 4233-5; *4+9: /: 80'
- 440 Mpcgr u'U.'Dqwti qku'II . 'Ej ctrigt'T.'O gtv'pu'G.'Nghxtg'L'Y kpf cgrg'M'0'Vgp/ { gct " ej cpi g'lp'ugf gpvct { "dgj cxkqt."o qf gtcvg'vq'xki qtqwu'r j { ulecn'cevxxk\ ." ectf kqtgur ktcvqt { 'hkpguu'cpf "ectf kqo gvcdrke'tkuml'lpf gr gpf gpv'cuuqekvqpu'cpf " o gf kvq'p'cpcn\ uku'0 *British journal of sports medicine*042380'
- 450 Nqhl'p'O . 'Uqj gtp'O . 'Cdg'V.'Dqpl'0'0'Gzr tguv'p'qh'XQ4r gcnlp' 'Ej krf tgp'cpf " [qwj . 'y kj "Ur gekn'T ghgt'peg'v'q' 'Cmqo gtle'Uecrki 0 *Sports medicine (Auckland, N.Z.)*04238-68*32+3673/820'
- 460 Y qtrf 'O gf lecn'Cuqekvqpu'0'F gerctv'p'qh'J gnukpnk/"'gy lecn'r tkpek'ngu'ht' "o gf lecn' tgugetej 'lpxqrxkpi "j wo cp'uwdlgevu'0 *WMJ*0422: -76*6+344/470'

470 Naj o cp'VI . 'Tqej g'CH'O ctvqgmT0Cpyj tqr qo gtle'Ucpcf ctf k čvkqp'T ghgt gpeg"
 O cpwcn0K0Ej co r cki p<J wo cp'Mkpvkcu=3; : . 'r '3990'

480 Vtquv'UI . 'O eKgt'MN.'Rcv'TT0Ecpf wvłpi 'ceegrtqo gvg/dcuqf "cevkxk\ 'cuuguo gpwł'
 k'kgrf/dcuqf 'tuguctej 0Med Sci Sports Exerc04227-59*33'Uwr r n<U753/650'

490 Ckdt 'C.'Ej cpcnI0Rj {ulecn'gf wcvkqp<vj g'ghgev'qh'gr qej 'ngpi vj u'qp'ej kf tgpł"
 r j {ulecn'cevkxk\ 'k'c'ut wewt gf 'eqvz v0PloS one04237-32*6+g234345: 0'

4: 0 Gxgpuqp'MI.'Ecvnkt'FL'I km'M'Qpf tcnMU.'O eO wtc{ 'TI 0Ecrkdtcvkqp'qh'y q"
 qdlgevkg'o gcuwt gu'qh'r j {ulecn'cevkxk\ 'hqt'ej kf tgp0Journal of sports sciences0'
 422: =48*36+3779/870'

4; 0 Mrcuqp/J gi i gdq'N.'Cpf gtugp'ND.'Y gppm'HCJ "gv'cr0I tcf gf "cuqekcvkqu'dgy ggp"
 ectf kqt gur ktcvqt { 'kvguu.'hcvp'uu.'cpf 'dmqf 'r tguwt g'k'ej kf tgp'cpf 'cf qnguegpwł'
 British journal of sports medicine04228-62*3+47/; =f kuewukqp"/; 0'

520 J cpugp'J U.'Htqdgti 'M'P kngup'LT.'J {rf gdtcpf vP 0C'pgy "cr r tqcej 'v'cuugukpi "
 o czko cn'cgtqdk'r qy gt'k'ej kf tgp<vj g'Qf gpug'Uej qqn'Ej kf "Uwf {0European
 journal of applied physiology and occupational physiology03; : ; =7: *8+83: /460'

530 J c{gu'CH0Introduction to Mediation, Moderation, and Conditional Process Analysis:
 A Regression-Based Approach04pf "gf 0P gy 'I qtm'P [<Vj g'I vkrhtf 'Rtguu=42390'

540 f g'Qpk'0.'Nqduv'V0F ghk'kpi 'qdguk\ 'tkmlucw'k'v'g'i gpgtcn'ej kf j qf "
 r qr wcvkqp<y j lej "ew'qhu'uj qwf 'y g'wug'Int J Pediatr Obes04232-7*8+67: /820'

550 Qti cpl cvkqp'Y J 0Global recommendations on physical activity for health.'I gpgxc<'
 Y J Q42320Cxc'cdg'htqo <'Y J Q0'

560 Urcpf 'LO 0W'f cvg'qp'vj g'o gvdqrk'u'pf tqo g'k'ej kf tgp0Current opinion in
 pediatrics04229-3; *4+3: 5/; 30'

570 Lwf leg'RD.'J co knqp'O V.'Uctf k'j c'ND.'\ f gtle'VY . 'Ukxc'CO 0Y j cv'k'vj g'o gvdqrk"
 cpf 'gpgti { 'equv'qh'ukv'kpi . 'ucpf kpi 'cpf 'uklv'ucpf 't'c'puk'k'qu'European journal of
 applied physiology04238-338*4+485/950'

580 Dgnej gt'DT.'Dgttki cp'F.'Rcr cej tkvr qwrq'W'gv'cr0Ghgev'qh'k'vgtt'w'kpi 'Ej kf tgpł"
 Ugf gpvct { 'Dgj cxkqt'Y kj 'Cevkxk\ 'qp'O gvdqrk'Hpvev'k'c'Tcpf qo k gf 'Vtkr0The
 Journal of clinical endocrinology and metabolism04237-322*32+5957/650'

590 Erkh'FR.'J gungvj 'MF.'Xgm'UC'gv'cr0Qdlgev'gn\ 'o gcuwt gf 'ugf gpvct { 'd'gj cxkqt'cpf "
 j gcnj 'cpf 'f g'g'qr o gpv'k'ej kf tgp'cpf 'cf qnguegpwł'u'vgo cvk't'g'x'ky 'cpf 'o gvc/
 cpcn\ uku0Obesity reviews : an official journal of the International Association for the
 Study of Obesity04238-39*6+552/660'

5: 0 Ej ctcpuqppg\ 'QN.'F gur tgu'LR0F kugcug'r t'gx'gp'kqp//uj qwf 'y g'vcti gv'qd'guk\ 'qt"
 ugf gpvct { 'k'gu'v'g'Nature reviews. Cardiology04232-9*: +68: /940'

5; 0 O ke'j gni'LC.'O cwqem'U.'P guu'CT'gv'cr0Ugf gpvct { 'D'gj cxkqt'cpf 'Q'dguk\ 'k'c'Ncti g"
 Eqj qtv'qh'Ej kf tgp0Obesity0422; -39*: +37; 8/8240'

620 Gngw'pf 'W.'Nwcp'LC.'Uj gtct'ND'gv'cr0O qf g'cv'v'q'Xki qt'qwu'Rj {ulecn'cevkxk\ 'cpf "
 Ugf gpvct { 'Vko g'cpf 'Ectf k'qo gvdqrk'Tkml'hc'v'qtu'k'p'Ej kf tgp'cpf 'Cf qnguegpwł'
 Jama-J Am Med Assoc04234-529*9+926/340'

630 Gngw'pf 'W.'J kf gdtcpf 'O.'Eqm'kpi u'RL0Rj {ulecn'cevkxk\ .'ugf gpvct { 'vko g'cpf "
 cf k'q'uk\ 'f w'kpi 'vj g'htuv'y q'f gecf gu'qh'k'g0P Nutr Soc04236-95*4+53; /4; 0'

640 Nko c'TC.'R'gh'gt 'MC.'Dwi i g'C.'O qngt'P E.'Cpf gtugp'ND.'Uqf f gp'F H0O qvqt "
 eqo r g'v'peg'cpf 'ectf kqt gur ktcvqt { 'k'vguu'j cxg'i t'gcvgt 'k'p'hw'peg'qp'dqf { 'hcvp'uu'vj cp"
 r j {ulecn'cevkxk\ 'cet'qu'vko g0Scandinavian journal of medicine & science in sports0'
 42390'

650 Ugi wtc'lko gpg\ 'X.'Rcttk'rc/O qt'gpq'H'Hgtp'cpf g\ /Ucp'qu'LT'gv'cr0Rj {ulecn'k'vguu'cu'c"
 o gf kcvqt'dgy ggp'qdlgev'gn\ 'o gcuwt gf 'r j {ulecn'cevkxk\ 'cpf 'em'v'gt gf 'o gvdqrk"
 u'pf tqo g'k'ej kf tgp'cpf 'cf qnguegpwł'v'g'WR(F QY P 'uwf {0Nutr Metab
 Cardiovas04238-48*33+3233/; 0'

660 J cpugp'DJ . 'Cpf gtugp'UC. 'Cpf gtugp'ND'gv'cr0Etquu/Ugevkqpcn'Cuuqekvkqpu'qh'
Tgcmqecvki 'Vko g'Dgwy ggp'Ugf gpvct { 'cpf 'Cevkxg'Dgj cxkqwtu'qp'Ectf kqo gvcdrle"
TluniHcevtu'kp' [qwpi 'Rgqr ng<Cp'k'pvtgpcvkqpcn'Ej krf tgp)'Ceegrgtqo gt { 'F cvdcug"
*ECF '+Cpcn'uku'Sports medicine0423: 0'
670 O czy gm'UG.'Eqng'F C.'O kej gm'O C0Dku'kp'Etquu/Ugevkqpcn'Cpcn'ugu'qh'
Nqpi kwf kpcn'O gf kvkq<Rctvkn'cpf 'Eqo r ngv'O gf kvkq'Wpf gt "cp'Cwqt gi tguukxg"
O qf gr0Multivariate behavioral research04233-68*7< 38/630'

"

"

"

"

Figure 1 – Mediation analysis of bouts, breaks and total sedentary time and physical activity, with total fat and abdominal fat indexes.

Abbreviations: BST/ST, breaks in sedentary time per sedentary hour; CRF, cardiorespiratory fitness; FMI, fat mass index; FMI_{abd}, abdominal fat mass index; MVPA, moderate-to-vigorous physical activity; Sed bouts, sedentary bouts; ST, sedentary time.

Figure 2 – Associations between bouts, breaks and total sedentary time and moderate-to-vigorous physical activity with total fat and abdominal fat indexes: the mediating role of cardiorespiratory fitness.

Abbreviations: BST/ST, breaks in sedentary time per sedentary hour; CRF, cardiorespiratory fitness; FMI, fat mass index; FMI_{abd}, abdominal fat mass index; MVPA, moderate-to-vigorous physical activity; Sed Bouts, sedentary bouts; ST, sedentary time.