Ab ac

Background: A... i... i sii a - a, i s s a ai, s a
ai i a is ass ia i a a a a s i a "a
si" - a a isa a s s ai sa a, i is as ai
(RAE) ias. A ii a a a i si a i a isi a i ai a i i.
T Ca a ia Ass ss P si Li a (CAPL) is a ass ss a ass s as s i
ai s ii 's Dai B ai s, P si C , M i ai a C i , a K a

Bac _ . d

Study protocol

Physical literacy was assessed using the CAPL protocol. Longmuir and colleagues [7] have published a detailed explanation of the CAPL protocol, including its validity. The CAPL is also available online (www.capl-eclp.ca), and includes a detailed manual, training videos, and other relevant information that can be accessed or downloaded, in either English or French, for free [25]. The CAPL instrument measures, which are consistent with the current definition of physical literacy by the International Physical Literacy Association, assess each of the four domains of physical literacy (Physical Competence, Daily Behaviour, Knowledge and Understanding, and Motivation and Confidence), and provide an overall composite physical literacy score (i.e., total CAPL score) [6, 7].

A Delphi expert panel process was used to inform the CAPL scoring system. The total CAPL score (maximum of 100 points) is a composite sum of the scores obtained in the four domains, where both the Physical Competence and the Daily Behaviour domains are more heavily weighted (32 points each) than the Knowledge and Understanding and the Motivation and Confidence domains (18 points each) (see Additional file 1) [6, 7]. For more details on Canada's physical literacy consensus statement, process, outcomes, and normative data, see Tremblay and colleagues [26, 27]. A short explanation of each domain is provided below.

Physical competence domain

The aim of the Physical Competence domain is to test children's physical core competencies to partake in physical activities by assessing their physical fitness, movement skills, and body composition. The score for this domain is composed of objective measurements of body composition (body mass index [BMI] z-score [28] and waist circumference [WC] [29]), cardiorespiratory fitness (Progressive Aerobic Cardiovascular Endurance Run [PACER] shuttle run) [30], muscular strength (grip strength) [29], muscular endurance (timed plank test) [31], flexibility (sit-and-reach) [29], and movement skills performance (Canadian Agility and Movement Skill Assessment [CAMSA]) (see Additional file 2) [32].

Daily behaviour domain

The Daily Behaviour domain contains three components: average daily step counts measured via pedometer worn for seven consecutive days, self-reported sedentary time, and self-reported moderate to vigorous physical activity. Pedometer data criteria were established as follows: (i) step counts between 1000 and 30,000 steps daily [33]; (ii) minimum wear time of 10 h daily [34]; and (iii) at least three days of valid data that meet both aforementioned criteria [35]. The two other components were subjectively assessed via questionnaire, where children were asked to recall how many days in the past week they had engaged in a total of 60 min or more of moderate to vigorous physical activity, and to self-report their daily screen time habits [25]. For more details on the sedentary behaviour assessment, see Saunders and colleagues [36].

Knowledge and understanding domain

The Knowledge and Understanding domain was assessed using a questionnaire that was designed to test aspects of healthy behaviour and the knowledge level that is expected based on Canadian physical and health education curricula (for grades 4, 5, and 6) across all provinces/territories [6]. The questions evaluate children's knowledge and understanding of the Canadian Physical Activity and Sedentary Behaviour Guidelines for Children and Youth (http://csepguidelines.ca/children-and-youth-5-17/), related terms, definition of health, recommended safety equipment to partake in certain physical activities and

paper, those with birth month missing were ineligible and removed (n = 3). For all the analyses, those with incomplete scores for the dependent variable of interest

our sample was representative of the Canadian birth distribution [42] according to a Chi-square goodness-of-fit test.

The F-test values presented in this section represent the main effect of the relative age in quarters or the covariates' contribution to the model, while the ones shown in Tables 3 and 4 are the corrected model F-test values. In Table 3, height of boys and girls was significantly associated with the relative age $(F(3, 4074) = 57.0, p$

Tab 4 R...

	B..s				Gi..s
PACER (a..s) (...=3970)	Ti...a (s...) (...=4044)	Gi..s... (...) (...=4045)	Si-a..-..a (...) (...=4044)	CAM9(...) (...=4044)(...=3970)	

biological maturity status and self-concepts, unmeasured in the present study, could have influenced children's scores on the Motivation assessment.

Evidence of the RAE in the affective domain is very limited. Thompson and colleagues [16] investigated the association between the RAE of Grade 1 children and self-esteem, and found a positive association between relatively older children and greater self-esteem in school. Although the study was conducted in a classroom setting and in younger children, no gender difference in the relationship between self-esteem and RAE was reported [16]. More research should investigate the association between gender, bio-

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Abbreviations
ANCOVA: aasis aa ; BMI: ass ; CAMSA: Caaa Aii a M SiAssss ; CAPL: Caaa Assss Psia Lia ; CSAPPA: Ci's Si-Pis Aaia Pi Psiaii; PACER: Pss AiCaasa EaR; RAE: ai ; RBC: RaBa Caaa; WC: aisi

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Authors' contributions

Ethics approval and consent to participate

Consent for publication

Competing interests

P b ' N
Si Na ais ai a jisiiaaisi iis asaisiiaaiais.

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References
1. Iaia Psia Lia Assia . 2016. s://. sia-iia.. /. Ass 3 A 2017.
2. Pias VJ, Ga CE, B s MM, Cas V, Ca J-P, Jass I, a. Ssai aisis ji as siaiia aiasis -a i a. Ai PsiN Ma. 2016;41:S197–239.
3. Casi DM, Baa JM, BaL. C aii siaiai sii: a s. J Si HaSi. 2015;4:156–63.
4. Gii S, Cis D, B C. Psiaia: i a, assss a iis. S M. 2014;44:1177–84.
5. Pai ACTION, Caaia S Li Si, Ha Ai Lii a OsiRsa Ga Ci's Hsia Eas Oai, Psia Ha a Eai Caa, Caaia Pasa Rai Assia, Oai S Psiaii Psi Pi Ha. Caaa's Psia Lia CsssSa, J 2015. 2015. s://. aiai./sis/ai/iis/as/Paiai-Caaia Psia Lia -Csss_0. Ass 3 A 2017.
6. Fais CE, Li PE, B C, A s LB, Bas JD, Biasaia E, a. T Caaia Assss Psia Lia: i a i 's aii aai, aiisi a Dii ss. J Ps A Ha. 2016;13:214–22.
7. Li PE, B C, L M, Ya Y, Biasaia E, Z W, Ta MS. T Caaia Assss Psia Lia: sii as 46 (812 as). BMC PiHa. 2015;15:767–88.
8. B JF, Dais S. A s - i isaa? Tia iai. O RE. 1990;16:67–80.
9. Ci S, Ba J, Wai N, MKa J. Aaa ia i: aaaiai ai siss. S Ss M. 2009;39:235–56.
10. Ms J, Gi S. Ua iiasai sa : ai ai is. D R. 2001;21: 147–67.
11. Rs SJ, B LM, Faii SJ, Sa G. Ti ai s aisia issis i 910 a1112 as . Pia E Si. 2012;24:72–83.
12. Bisa J, Mis FJ, D M. Es asi a isii a aiai sins. D Ps. 1995;31:221–36.
13. Ca T. Saias: i-assaii iaa ai. BE Rs J. 2014;40:749–71.
14. Rs SJ, Faii SJ. Ti ai ai assss sis sisia aii UiKi. J Ta Ps E. 2012;31:56–70.
15. Ss EDA, B JF, Vi RC. Bi a s:ai ia 1990-. Cai: Cai Assss, Uisi Cai La Eaia Sia; 2016.
16. Ts AH, Bas RH, Ba J. Tai a si-s. E Rs. 2004;46:313–20.
17. Paaa P, Bs J, F P, Vsais P, H N, D J, W M. T asiiai saa iiaas. J A s Ha. 2015;57:475–81.
18. D E, Lis S. Disa ? Raia sa aii sss s. EE R. 2010;29:857–72.
19. Ca J, Ti V. Assai ais a ia . EP S E R. 2015;21:114–31.
20. D N, Caaa A, Rasa M. Rai isassiis : Ei ais Fasa.Sa J M Si Ss. 2011;21:120–8.
21. M RL, Gaa EJ, W JM, Ma M, Ta S, D CR. I ai issis a ai-ii/ aiiisii. Ca M Ass J. 2012;184:755–62.
22. Bi S, Cis L, O SW, Da MJ. Eai ai si aasiiii Biisi 6–11 as. J S C Rs. 2016;30:2809–15.

23. Sa   GR, Ta   MJ, V ss C, Q   AA, C   DD, Pa   DA. Q a ii a i   a i a   i   i i s   s i a   a . J S   C   R s. 2013;27:3293–9.

24. V   i   S, Ri a   L, Cai   J. R a i a   s i   M   Ass ss   Ba   C i   –2: a   a i   a s i   s. C i   Ca H a   D . 2017:1–6. [E   2017 Ma 15].

25. H a   A i   Li i a   O   si R s a   G   . Ca a ia Ass ss   P si a Li   a :   a a   s a i i s a i . O a a: H a   A i   Li i a   O   si R s a   G   ; 2013.   s://   . a   - s . a/   -   / a s/ a   - a   a - i i S   . . A ss   3 A   2017.

26. T   a MS, C s a s-B a s   C, Ba   s JD, Ba   B, Da   i D, La   C, a . Ca a a's P si a Li   a   C   s s S a   :   ss a   . BMC P   i H a   . 2018;18(S   2).   s:// i. g/10.1186/s12889-018-5903- .

27. T   a MS, L   g i PE, Ba   s JD, B a   s K, A s   KD, B   B, a . P si a i a   i   s Ca a ia i   a   8–12   a s: s i i a   a i   s s   RBC L a   P a -CAPL   j . BMC P   i H a   . 2018;18(S   2).   s:// i. g/10.1186/s12889-018-5891- .

28.   O   is M, O a g   AW, B g i E, Si a   A, Si a   J. D   i   a WHO g   s - a g   i   a a   s. B   W   i H a   O g a . 2007;85:660–7.

29. CSEP. Ca a ia S i   E   is P   si i g – P   si a A i i   T ai i g   H a   . CSEP: O a a; 2013.

30. Ca   AL, B   s   J, W i D, M   g DP, W a   B, His g   J, a . S   a   a i   i   i ss   i s i   s   s   - a s   s i g. J P ia . 2012;161:120–4.

31. B   C, T   a MS, Sa   s TJ, M Fa   a   A, B g   s M, L   M, L   g i PE. F   a s i i , a i a   a   i a i i   a is i   i   a s   a i - a s   ass ss   s   s   a   a   i   8– 12   a s g   . P ia E   S i. 2013;25:407–22.

32. L   g i PE, B   C, L   M, B g   s MM, K g   E, Sa   s TJ, a . Ca a ia A g i   a   M   S i   Ass ss   (CAMSA):   a i i ,   j   i i , a   a   i a i i i   i   8–12   a s g   . J S   a   H a   S i. 2015:231–40.

33. R   DA, Ma   a MT, Ra   TD, L   J. M as   i g   si a   a   i i i   i   i   s: a i i ,   a i i , a   a   issi g   a   a . P ia E   S i. 2004;16:1–12.

34. Eis   a   JC, La   s   KR, Wi   i EE, G   i D, Wa s D. U i i   s   a i s   i i g   g   i   i i   . I