

- ✖ **Exploring physical literacy in chronic disease participants:**
- ✖ **Development and effects of a pilot intervention**



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PL pilot intervention
in chronic disease










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Why Physical Literacy?

THE BENEFICIAL EFFECTS OF PHYSICAL ACTIVITY IN CERTAIN DISEASES

	METABOLIC		PULMONARY			
	type II diabetes  cardiovascular and all-cause mortality	 control of blood glucose	asthma  physical aerobic aptitude and endurance (VO2 max*)	 quality of life (number of symptomless days)		
	type I diabetes  physical aerobic aptitude	 lipid profile	 insulin-resistance and insulin requirements	cancer  aerobic capacity, muscle strength	 quality of life	 weight, BMI and body fat
	obesity  visceral fat	 maintenance of initial weight loss	inflammatory rheumatism  pain, harmful effects	 functioning (RA, AS)**		
	coronary diseases  quality of life	 VO2 max*	 blood pressure	lower-limb osteoarthritis  pain	 functioning	
	 muscle strength	 heart rate	 mortality and rehospitalization	depression  depression symptoms	 anxiety/depression symptoms following another chronic disease	
	chronic heart failure  biological markers	 quality of life	 VO2 max*	stroke  functioning (walking distance)	 VO2 max*	

* VO2 max : Maximum volume of oxygen consumed
 ** PR : rheumatoid arthritis
 ++ SPA : ankylosing spondylitis
 † Improvements
 ‡ Limitations

Illustrations : Floris Arnhem

ANSES (2019)

BARRIERS TO PHYSICAL ACTIVITY FOR ADULTS WITH ARTHRITIS

41% of people with arthritis are inactive, due in large part to 4 barriers:



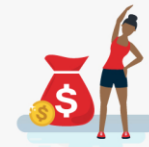
1 PHYSICAL
(pain and fatigue)



2 PSYCHOLOGICAL (lack of motivation and fear of pain)



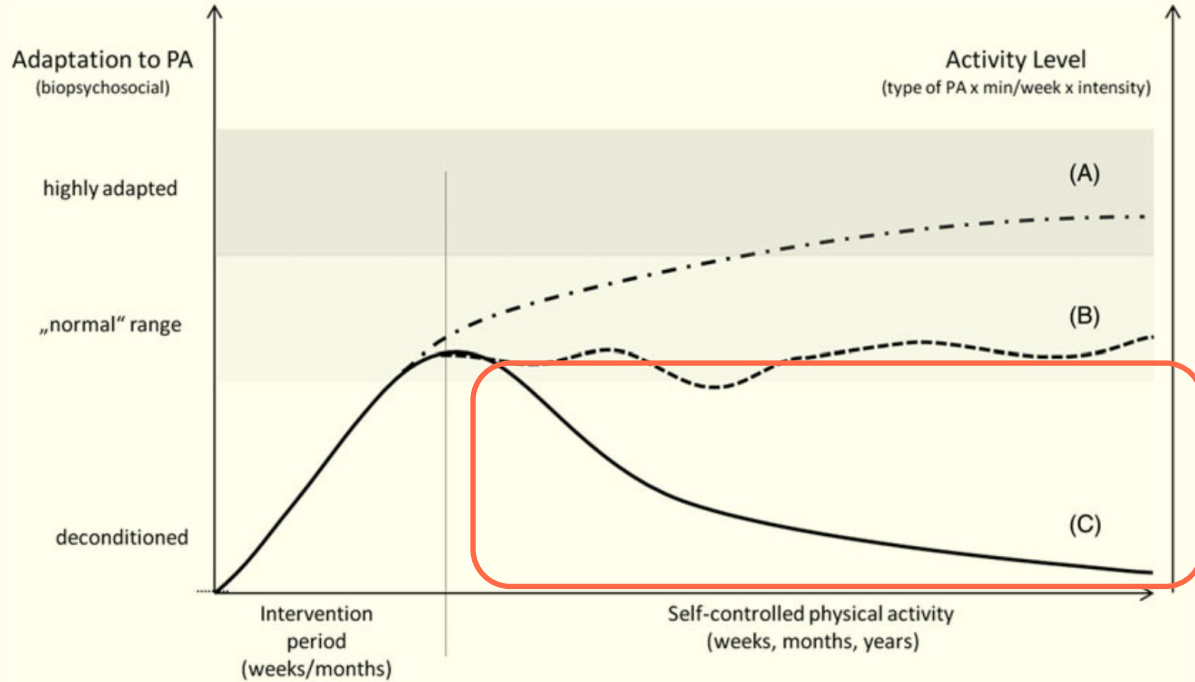
3 SOCIAL (lack of a support system)



4 ENVIRONMENTAL (costly fees, no transportation and lack of access to safe places to exercise)

Learn more

Visit- <https://oaction.unc.edu>



Adaptations to short-term exercise interventions and their post-intervention progression

Geidl, Pfeifer & Semrau (2014)

Ongoing limits of PA/exercise promotion

Accessibility & Inequality

Accessibility to health services limited for low SES

Motivation/Behavior change foundations

Exercising, short-term physical improvement centered programs



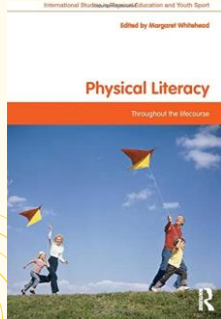
One-Size-Fits-All Approaches

Lack of time, knowledge, referral for PA in health care professionals

Hospital vs community-centered approach

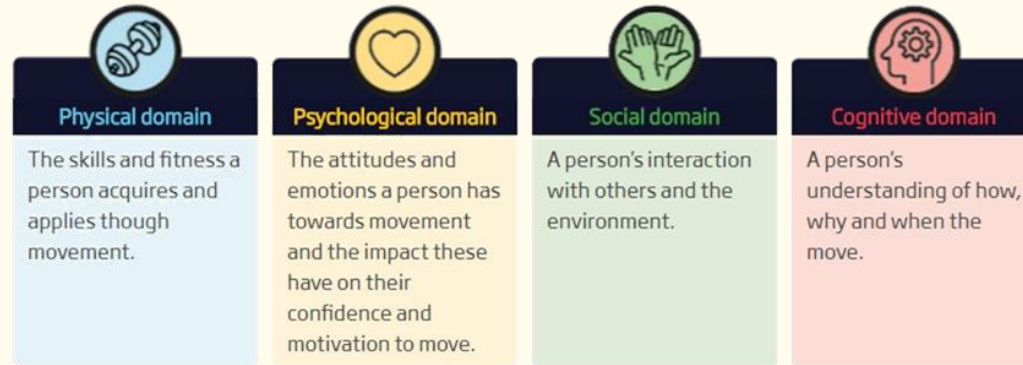
Lack of ecological perspective on participants' PA

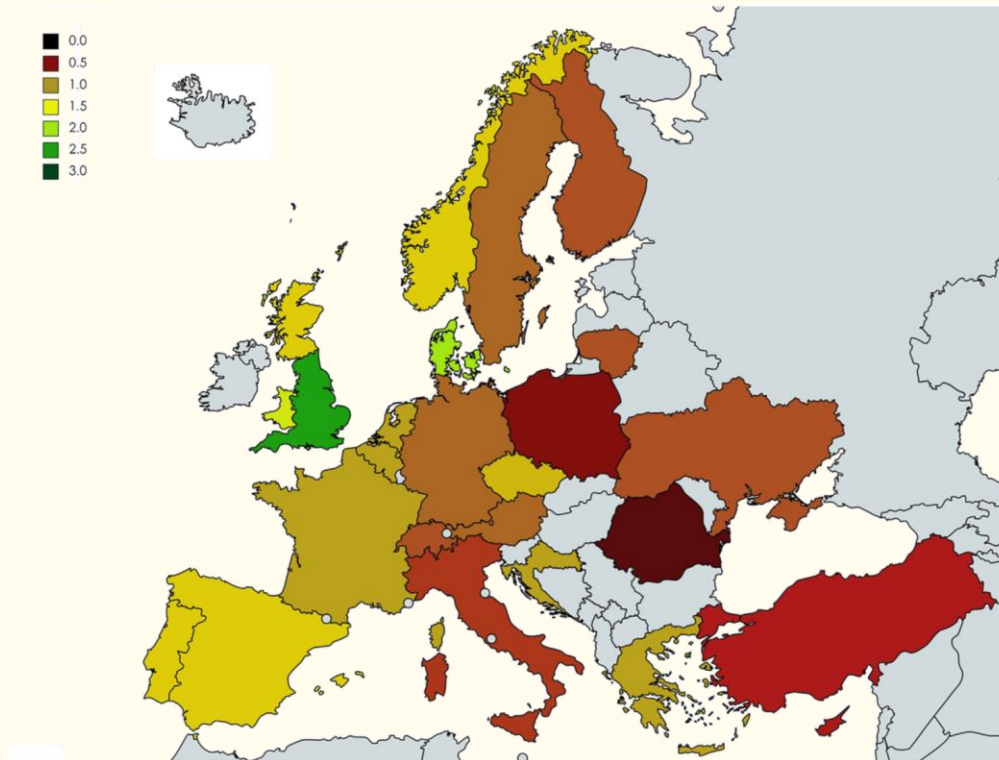
*Powell et al. (2006); Bauman et al. (2016);
Kahn et al. (2002); Moschny et al. (2011)*



“Motivation, confidence, physical competence, knowledge, and understanding to value and take responsibility for engagement in physical activities for life”

International Physical Literacy Association (2017), inspired from Whitehead (2001)





Physical Literacy implementation in Europe

Carl, ..., Mouton, et al. (2023a)

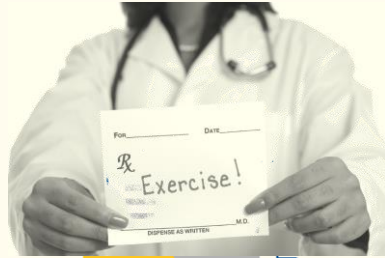
One of the “blank spots”

- Evidence support a relationship between the physical domain of physical literacy and improved health outcomes, but evidence is missing in specific populations ✕
- Most physical literacy research is focused on children, few in adults, almost none in older adults and chronic disease populations ✕
- Greater emphasis is placed on the physical domain of physical literacy, leaving the remaining domains (affective, cognitive, and behavioural) underrepresented/understudied
- Health care practitioners are not yet engaged with the construct of physical literacy in practice

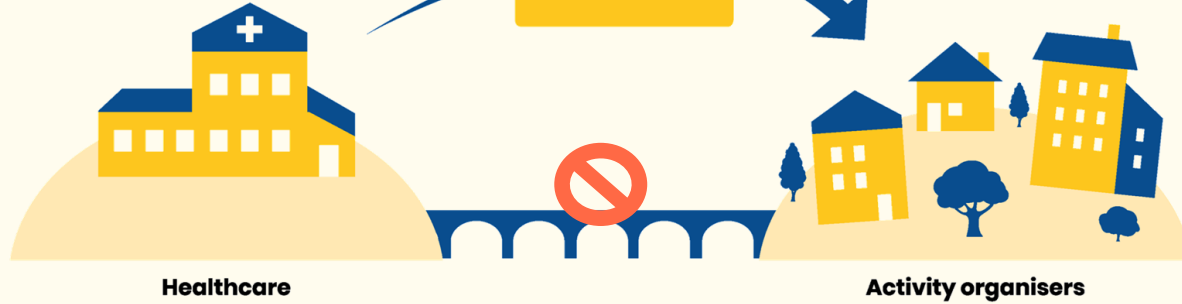
Cornish et al. (2020)
Carl et al. (2022; 2023a)

01

Why Physical Literacy?

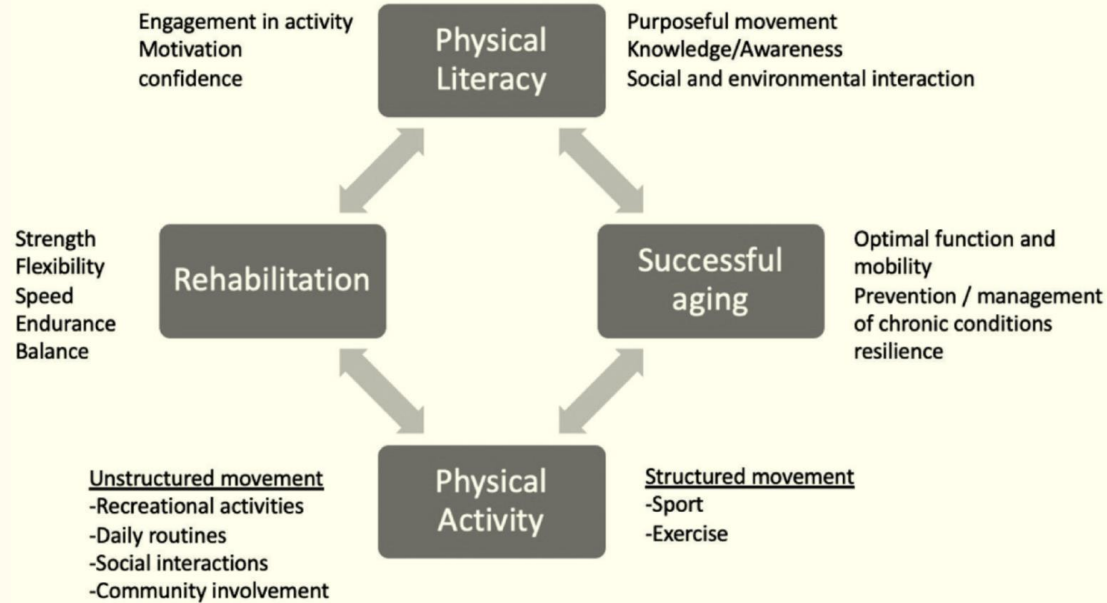


**Physical Activity
on Prescription**



Missing bridge between healthcare and autonomous physical activity

Marsault (2017)



Physical literacy for adults through a rehabilitation lens

Petrusevski et al. (2022)

Objective & Methods



Explore the effects of a physical literacy assessment and counselling session in chronic disease participants



Longitudinal quasi-experimental study
(T1= pre-intervention, T2= 2 months post-intervention)



Control vs Experimental group design



T0 = 108 (71% ♀; 56±15 yrs)



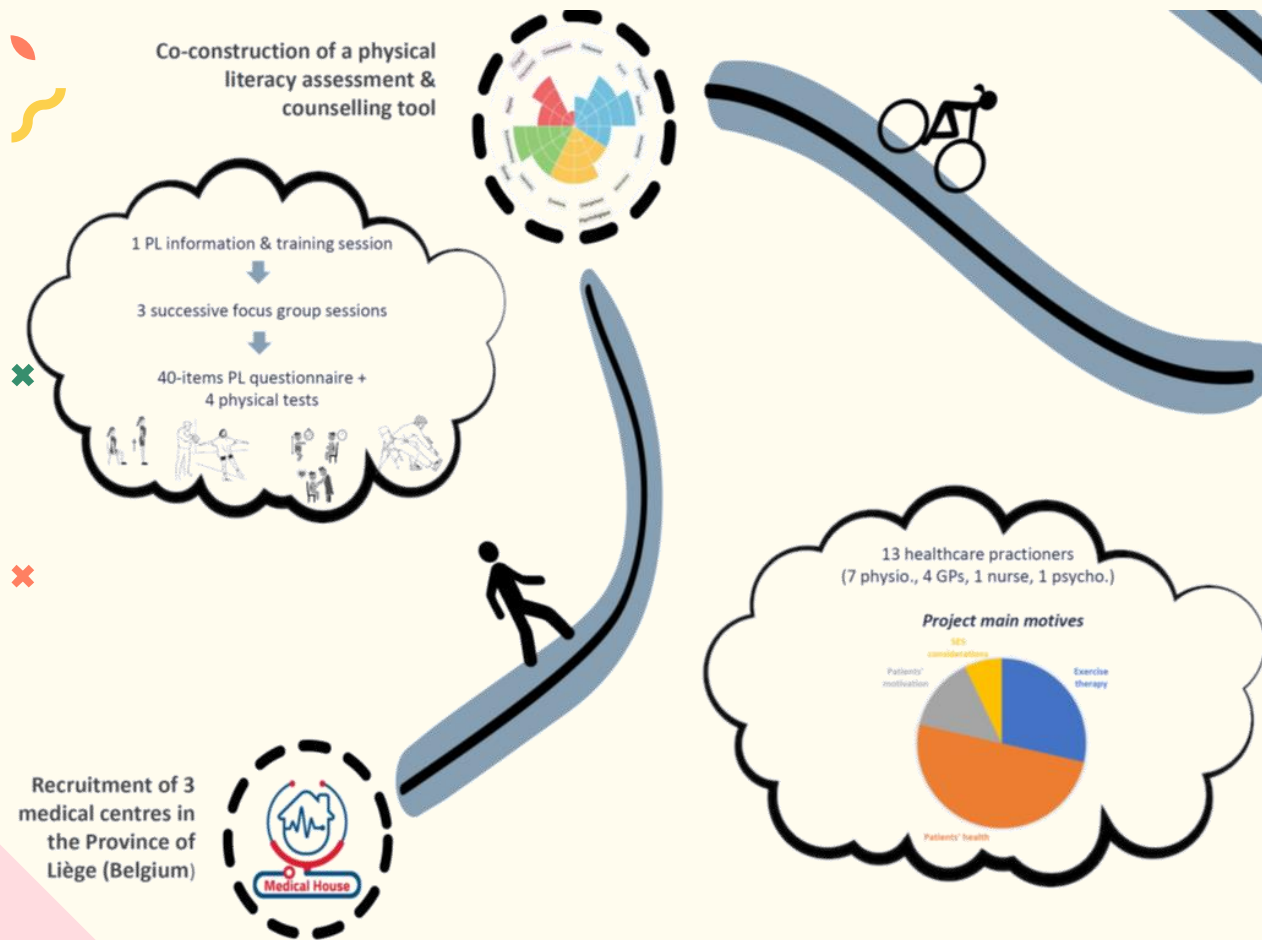
Adult (+18) with chronic disease

T1 = 64 (74% ♀; 61±13 yrs)



Recruitment of 3 medical centres in the Province of Liege (Belgium)

Co-designing of the physical literacy counselling scheme



"Developing approaches that broaden the focus to include everything that makes a human being [...] is undoubtedly more relevant" (psycho.)

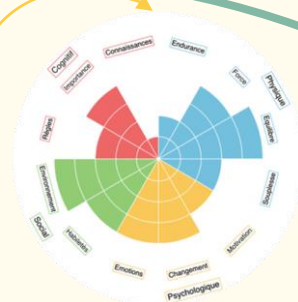
"It could bring a "complementary work" with other health professionals who work here. The physical educator will share his skills with the team and patients" (physio. 3)

Design of the intervention

APA specialist



40-items 4 PL dimensions questionnaire
4 physical tests
Aggregate PL score /100 (/25 per dimension)



Referral

PL assessment
(T0)

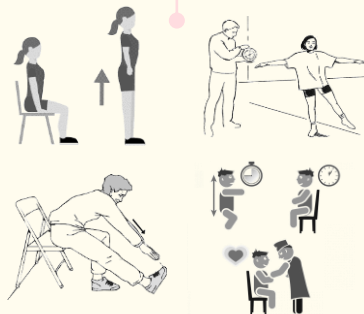
direct

PL
counselling

+ 2 months

Follow-up
assessment (T1)Healthcare
professionals

GP, Physio, Psycho, Nurse

Motivational interviewing
technique

Individual goals-oriented

Link with community PA

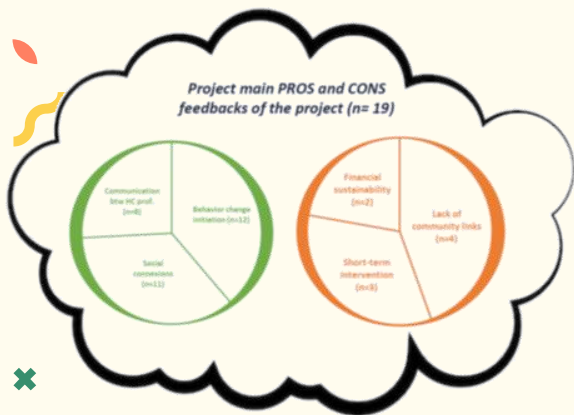


Results

PL dimensions	T0			T1 (+2 months)		
	GC (n=20)	GE (n=44)	Inter-group P-value	GC (n=20)	GE (n=44)	Inter-group P-value
Psycho.	78,62	70,52	0,1	78,99	72,09	0,11
Social	74,34	74,91	0,78	75,2	77,45	0,78
Cognitive	59,19	69,68	0,01	59,53	73,93***	>0.001
Physical	64,11	52,53	0,03	64,56	54,34	0,02
PL total score	69,07	66,91	0,59	69,57	69,46**	0,6

*only mean values presented; ask about IC variability & SD
P-value *<0,05;**<0,01;***<0,001

Qualitative follow-up of the project



✗ *"Dedicated Whatsapp groups were created, it is nice!" (physio. 4)*

"My flexibility and balance have improved, the GP congratulated me!" (P10)

✗ *"Communication with GPs remains challenging" (health manager 1)*

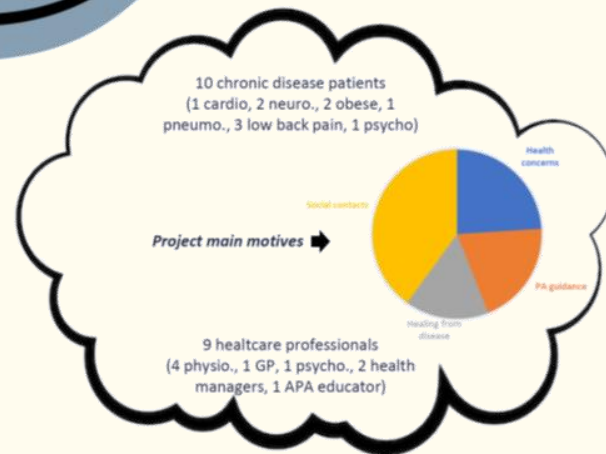
"If I had to pay for it, I wouldn't be so enthusiastic about it"(P9)



Follow-up interviews by phone



Physical literacy for a life-long participation in physical activity



"My physio. referred me to the project" (P5)

"Stay active is good for my health" (P1)

"If someone can help and guide me, why not!" (P2)

Discussion & future directions

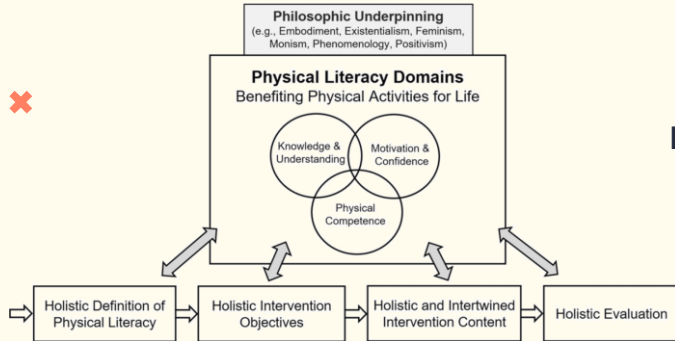
Increase follow-up duration



Reinforcing bridge with community PA



Integrate LP into adapted PA programs



Carl et al. (2023b)

Physical Literacy Interventions Reporting Template



Weerts & Mouton (2023)

https://www.chuliege.be/jcms/c2_26224880/en-mouvement-pour-ma-sante

Intervention design

1. Physical activity behaviour and engagement
2. Physical competence
3. Motivation and confidence
4. Knowledge and understanding
5. Social interaction
6. Meaningful and purposeful activities



12 items-Q
6 PL dimensions
4 Physical test

LP group sessions

12 participants/group max
PE/APA specialist

Control
group

APA
group

APA + PL
group

Medical
referral

PL Assessment

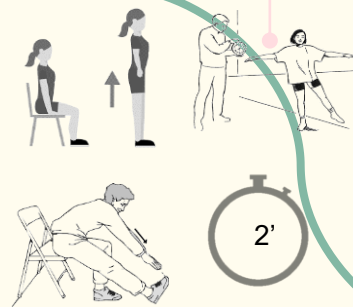
12 weeks APA
(+PL) sessions

+ post-cycle

Follow-up
Assesments

+ 3 months

GP



Motivational interviewing
technique (phone call)

Individual goals-oriented

Link with community PA

Individual PL follow-up



PL-oriented APA sessions

Session n°	PL domains	PL-oriented content focus
1	Pre-intervention PL assessment	30 minutes of LP evaluation; group divided into two: 15 minutes of questionnaires for group 1 and 15 minutes of physical tests for group 2 and vice versa.
2-7	(1)+(2)	<ol style="list-style-type: none"> 1. Raise awareness of current personal physical activity (PA) habits in playful form. 2. Encouragement to practice through the provision of monitoring tools (watches, pedometers, home exercises, calendars) inviting participants to initiate the practice of PA outside the session.
3-8	(1)+(3)	<ol style="list-style-type: none"> 1. Information and awareness about PA in and its dimensions (types, recommendations, benefits). 2. Exchange on the physical environmental offer (park, trails, sport facilities, etc.) and social (sports group, association, etc.) of AP available at local level.
4-9	(1)+(4)	<ol style="list-style-type: none"> 1. Experimentation of collective/cooperative exercising situations (pairs or groups). 2. Invitation to extend practice outside the sessions by involving the entourage; awareness of the participant's potential role as an PA initiator. 3. Invitation to practice between participants beyond the session cycle.
5-10	(1)+(5)	<ol style="list-style-type: none"> 1. Collective identification of key barriers to participant PA; valuing the progress of each. 2. Role-playing, taking responsibility of the participants in the session to increase the perception of skills.
6-11	(1)+(6)	<ol style="list-style-type: none"> 1. Sensitisation of the participant towards PA who have meaning in his daily life. 2. Diversification of exercise modalities (music, groups, new formats) to solicit pleasure. 3. Autonomous choice of exercises and modalities by participants
12	Post-intervention PL assessment	30 minutes of evaluation LP: Group divided into two: 15 minutes of questionnaires for group 1 and 15 minutes of physical tests for group 2, and vice versa.

(1) Physical competence (2) Physical activity behaviour/engagement in physical activity (3) Knowledge/understanding
(4) Motivation and confidence for physical activity (5) Environment interactions (6) Meaningful/purposeful activities

“Physical literacy is required as a foundation to an active population”...

Westerbeek & Eime, 2021

But there is still an avenue to explore its full potential in research and practice



Thank you for your attention

Exploring physical literacy in chronic disease participants:

Development and effects of a pilot intervention

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URL LinkedIn

<https://www.linkedin.com/in/mouton-alexandre-4a2b3b15/>

URL Google Scholar

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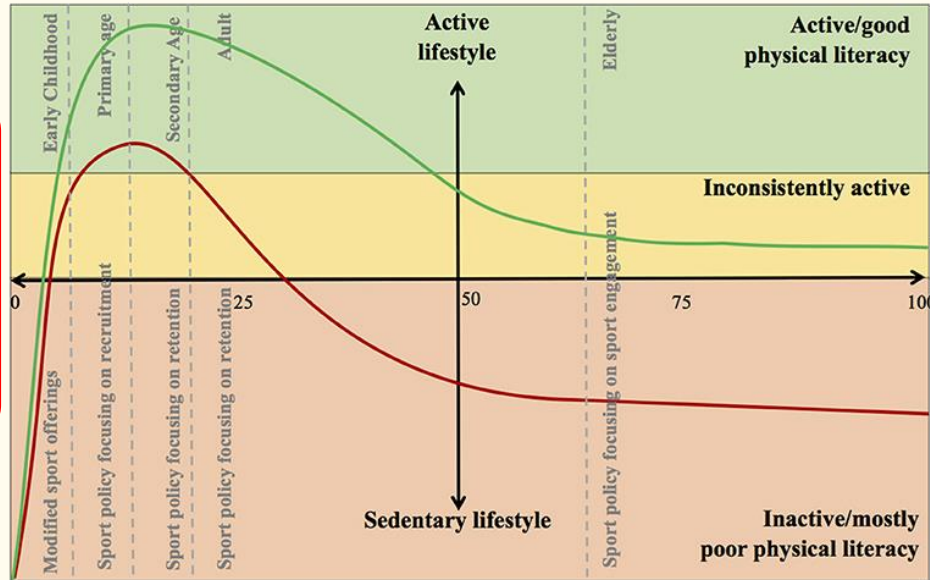
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Physical Literacy origins

Developing physical literacy through parental role modelling, physical education and active engagement with the world

- Physical
- Psychological
- Cognitive
- Social



—
= current physical activity and sport participation

—
= future physical activity and sport participation

Early life stage focus: fundamental movement skill development, frequent play and movement experiences that are fun as a preventative approach to physical inactivity and way into sport

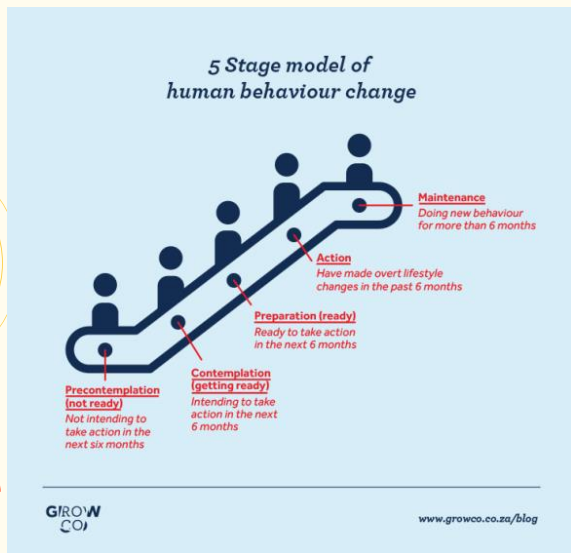
Mid life stage focus: fundamental movement mastery and skill transition and maintenance ensuring a physically active lifestyle and opportunity to play sport

Late life stage focus: fundamental movement skill maintenance and adaptation as a preventative and curative approach to physical inactivity and maintaining involvement in sport (clubs)

Physical Activity and Sport Participation (PASP) framework

Westerbeek & Eime (2021)

Behavior change & Physical Activity...



Transtheoretical Model
(Prochaska & Velicer, 1997))

Self-Determination Theory for Physical Activity (Ryan & Deci, 2009)

Physical Literacy



1 Core

Focused on the inherent potential of all humans to learn through physical interaction with the environment



2 Constitution

Based on integrated development spanning the four of physical, psychological, cognitive, and social learning domains



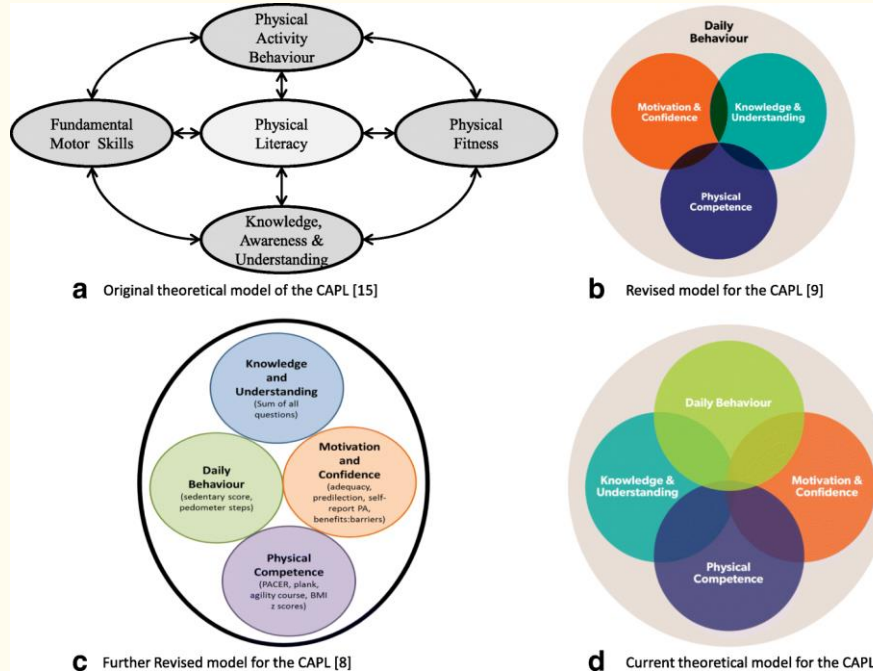
3 Importance

Helps a person to learn more about the world, become more capable, and ultimately pursue a range of fulfilling activities, as well as the known benefits to health associated with PA

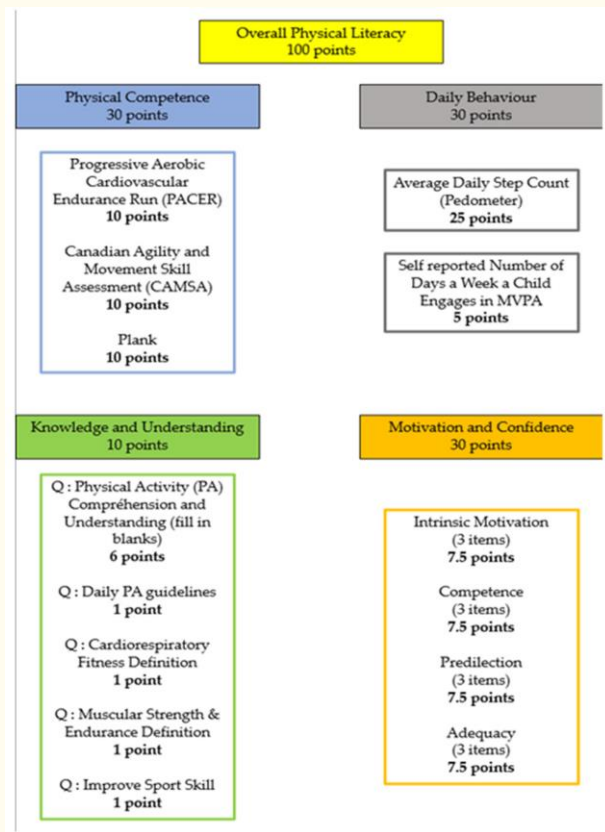
4 Aspiration

Describe possible configurations, becomes self-perpetuating, such that the individual persists with PA, and/or reengages following interruptions such as injury, or significant life events





Evolution of CAPL Assessment of PL



Characteristics of Physical Literacy Journeys		Unaware of or dismissing potential	Exploring potential	Developing potential	Consolidating potential	Maximising potential
Motivation	Motivated to participate in physical activity.	I seldom want to engage in physical activity.	I am physically active because I enjoy it.	I participate in physical activity for the joy of it and because it is important to me.	I maintain being physically active because it is part of who I am and because I value it.	I am motivated to try new activities and challenge my capabilities.
	Sustained application and engagement. Motivated to apply oneself.	I do not apply myself fully when engaged in physical activity.	I apply myself during physical activity.	I do not give up easily and keep going. I am persistent and resilient.	I sustain my engagement and involvement in regular physical activity.	I am determined to challenge my self in a range of environments.
	Motivated to take steps to include physical activity in life my pattern.	I take steps to avoid physical activity.	Physical activity is included in my life pattern.	Physical activity forms a increasingly regular part of my life pattern.	Physical activity is a secure part of my life pattern.	I seek new ways to include physical activity in my life pattern.
Confidence	Confident to engage.	I am not confident to take part in physical activity.	I look forward to taking part in physical activity.	I am confident that I can fulfil the tasks set and that others will support me.	I am certain that participation will be rewarding and enhance my self confidence.	I am confident that, with practice/effort I can fulfil the challenges set by myself and others.
	Self perception of ability and belief that progress can be made.	I am not confident that I can make progress in physical activity.	I am confident that I can make progress in physical activity.	I am aware that I have made progress in some activities and confident that I am capable of making further progress.	I know I can have rewarding experiences in physical activities and this enhances my self esteem.	I appreciate my movement ability and am confident that I can enhance my expertise and learn from future challenging experiences.
	Confident to interact and engage with a range of environments.	I am generally not at ease in physical activity environments.	I am at ease engaging in physical activity in varied indoors and outdoors situations.	I look forward to new settings and activities in the confidence that I can engage effectively within these environments.	I am confident to explore a range of settings, more or less familiar to me, with the assurance that I can respond to the demands they make on me.	I relish new and challenging environments and set myself ambitious goals.
Physical Competence	Movement patterns that constitute the foundation of all movement/physical activity.	I have limited movement vocabulary related to physical activities.	I am developing my movement vocabulary associated with a wide variety of physical activities.	I am developing general and refined movement patterns and linking them into sequences associated with a range of physical activities.	I continue to apply and adapt my movement patterns that form more complex sequences related to the physical activities in which I participate.	I am able to move effectively using specific movement patterns in one or more challenging physical activities.
	Movement within a wide range of environments both individually and with others.	I am seldom able to move effectively in movement environments.	I am starting to engage a wide variety of physical activity environments both individually and with others.	I am successfully engaging in physical activity in an increasing range of varied environments both individually and with others.	I continue to engage effectively and efficiently in a variety of physical activity environments both individually and with others.	I seek out opportunities to challenge myself in a range of physical activity environments individually and/or with others.
	Sensitive perception of and perceptible action in interaction with physical activity environments.	I am not aware of movement requirements related to most physical activity environments.	I am starting to develop my awareness of the movement requirements of varied physical activity environments.	I am becoming more aware of and sensitive to the demands presented by varied physical activity environments.	I show heightened sensitivity to and awareness of my physical competence when interacting perceptively in physical activity environments.	I am perceptive in appreciating all aspects of challenging physical activity environments, anticipating movement needs or possibilities and responding appropriately to these with perception and imagination.
Knowledge and Understanding	K&U - Reflecting and improving performance.	I find it difficult to describe what I am doing well and where I need to improve.	I can identify movements that I am working on and think about what I need to improve.	I can describe movements I that I am working on, suggesting where I am being successful, and targets that I could work towards.	I can evaluate movements that I am working on, identifying where I am being successful, setting realistic targets and devising ways in which I can work towards these targets.	I can analyse all aspects of movement that I am working on, describing my strengths and aspects that require improvement. I challenge myself by devising strategies through which I can reach targets.
	K & U - Planning, interacting and creativity.	I find it hard to work by myself or with others when I participate in physical activity.	I can work individually and with others in planning and adapting movement sequences and physical activities, contributing ideas and listening to the views others.	I can work individually and with others, in a range of settings, creating and refining movement sequences and physical activities, contributing ideas, listening to and respecting the views others.	I can work individually and with others in reflecting on, creating and refining movement sequences and physical activities. I contribute ideas, listening to and respecting the views of others and play my part in different roles in competing and co-operating with others.	I work individually and with others, in challenging physical activity environments, creatively planning my own and others responsibilities in competitive and co-operative situations.
	K & U - Wellbeing and valuing physical activity.	I am not convinced of the importance of physical activity for my holistic health and well being.	I understand that physical activity helps me to keep well so that I can enjoy life.	I understand that participating in physical activities will have a beneficial effect on my holistic health and provide opportunities for me to thrive in physical activity settings alone and/or with others in a variety of different environments.	I understand that participating in a range of physical activities, will have a positive impact on my holistic health, and enable me to maintain my quality of life.	I understand that participating in a range of physical activities opens up a world of opportunity for challenging myself in worthwhile experiences in a wide variety of settings that will contribute to my holistic health as well as enhance my quality of life.

Charting Physical Literacy Journey Tool

PHYSICAL LITERACY FOR LIFE (IPLA September 2016)					
Stages of Physical Literacy Journey in relation to the Life course					
Pre-School	Early Years + Primary School	Secondary School	Young Adulthood	Adulthood	Older Age
Developing, establishing, maintaining and/or challenging physical literacy					
<p>Developing physical competence and the joy of movement fostered, supported and encouraged.</p> <p><i>Provision of regular purposeful guided play in a range of stimulating environments which encourage creativity, imagination and exploration along with the development of control and co-ordination of a range of movements.</i></p> <p><i>Healthy approach to physical exercise, sleep and diet.</i></p>	<p>Physical competence is developed alongside motivation, confidence and knowledge and understanding.</p> <p><i>Developing an awareness of the benefits of physical activity for holistic health.</i></p>	<p>Characteristics of physical literacy are established and contextualised in a range of physical activities and contexts.</p> <p><i>Enhancing awareness of the benefits of physical activity for holistic health.</i></p>	<p>Consolidation of characteristics of physical literacy, achieved by own motivation to participate in selected physical activities as part of life-style.</p> <p><i>Promotion of an understanding of the benefits of physical activity for holistic health.</i></p>	<p>Physical literacy maintained, contributing to successful and rewarding physical activity being a part of an individual's life-style.</p> <p>Continued interest in, and awareness of, the way physical competence can be beneficial in respect of quality of life, including aspects of health promotion.</p> <p>Opportunities taken to challenge oneself to try new activities and or aim for a higher level – may set more demanding goals for self</p> <p><i>Promotion and increasing awareness of the benefits of physical activity for holistic health.</i></p>	<p>Personal physical literacy journey modified with age. Continued appropriate activity. Increase of knowledge and understanding in relation to changing capacities, health in older age and the importance of an active life-style.</p> <p><i>Promotion of the continued importance of physical activity for holistic health.</i></p>
Personnel influencing the attainment and maintenance of Physical literacy include:-					
Parents, family, significant others health and community workers	Teachers, LSAs, parents, family, peers, coaches, club and leisure facility personnel, health and community workers.	Peers, family, work place colleagues, personnel in:-, medical fields, clubs, fitness industry, leisure facilities, evening classes (coaches, sports development officers), health and community workers.			
Systems, situations, contexts where Physical literacy can be encouraged, established and maintained include:-					
<p><i>Provision of high quality family, school physical education and community activities in a range of varied environments that encourage active participation, learning and access for all.</i></p> <p><i>Provision of regular purposeful guided play (for younger children) in a range of stimulating environments which encourage creativity, imagination and exploration along with the development of control and co-ordination of a range of movements.</i></p> <p><i>Provision of social and empathetic learning environments that allow for the development of positive attitudes, values and beliefs in relation to healthy active lifestyles.</i></p> <p><i>Provision of healthy social community environments that support travel, access to facilities, personal development and health care.</i></p> <p><i>Provision of community activities and facilities for sport and non-competitive physical activities that engage a wide range of people.</i></p> <p><i>Provision of a range of challenging and supportive environments that allow for the development of positive attitudes, values and beliefs in relation to healthy active lifestyles.</i></p> <p><i>Provision of healthy social community environments that support travel, access to facilities, personal development and health care.</i></p> <p><i>Environments - Home, Nurseries, Pre-School Activity Clubs, School, Local Environment, Community clubs and teams, Day Care settings, local and national facilities, work environments and travel.</i></p> <p><i>Support - Qualified staff, supportive medical professions, employer and government policies and priorities.</i></p> <p><i>Communication – media, schools, health</i></p>					
Methods that could be used to chart progress include:-					
Parental and health worker monitoring of physical, affective and cognitive development	Parent, pupil and teacher monitoring and recording of progress re. motivation, confidence, physical competence and knowledge and understanding	Parent, pupil and teacher monitoring and recording of progress re. motivation, confidence, physical competence and knowledge and understanding	Commercial products of simple records of activity and experiences e.g. Fitbit, Facebook, Diaries and log-books that conceptualise the lived experience of participation, performance and movement. Future targets and goals re: motivation, confidence, physical competence and knowledge and understanding to provide a focus for a lifetime of development.		