Movement behaviours and cognitive development in early childhood

Evidence, insights and interventions from South Africa




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How it began

Little Champs

- Motor development programme for preschool children in disadvantaged communities
- Assessed impact of programme on gross motor skills and school readiness
- Children exposed to the programme had significantly better locomotor ($p<0.005$) and object control ($p<0.01$) skills compared to controls
- Significant improvement in school readiness scores of children who participated regularly in the programme ($p<0.0001$)

Draper CE, Achmat M, Forbes J, Lambert EV. Impact of a community-based programme for motor development on gross motor skills and cognitive function in preschool children from disadvantaged settings. *Early Child Development and Care*. 2012; 182:137-152.

Where did that lead?

- Focus on early childhood, specifically the preschool years
- Gross motor skills
- Physical activity
- Adiposity
- Screen time
- Sleep
- Context –
  - Preschools
  - Home environment
- Urban / rural differences

Where we started

- Low-, middle- and high-income urban settings: Cape Town
- Rural low-income setting: Bushbuckridge, Mpumalanga
- 3-6 year old children (n= 421)
  - Height and weight
  - Accelerometry (Actigraph GT3X+)
  - Test of Gross Motor Development – Version 2
  - Observational System for Recording Physical Activity in Children – Preschool version
- Teachers, parents/caregivers (n=55)
  - Focus groups

Jones S, Hendricks S, Draper CE. Assessment of physical activity and sedentary behaviour at preschools in Cape Town, South Africa. *Childhood Obesity* 2014; 10:501-510.

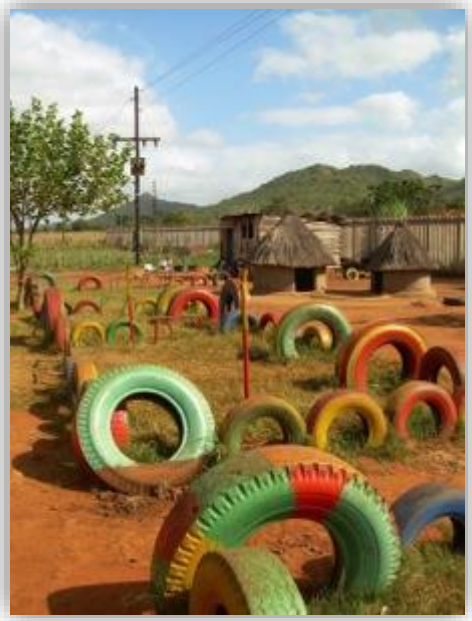
Draper CE, Tomaz SA, Stone M, Hinkley T, Jones RA, Louw J, Twine R, Kahn K, Norris SA. Developing intervention strategies to optimise body composition in early childhood in South Africa. *Biomed Research International.* 2017; 2017:1-13.

The preschool context

- All settings:
  - Very little intentional physical activity promotion
  - More likely to be active outdoors
- Higher income preschools have more variety in their day, better facilities and qualified teachers; 79% of time indoors
- Low-income urban preschools have very limited space; sometimes no outside play area; 93% of time indoors
- Low-income rural preschools have much more space, but don't do much learning; lack basic amenities
- Low-income teachers generally poorly qualified; worse in rural areas

Jones S, Hendricks S, Draper CE. Assessment of physical activity and sedentary behaviour at preschools in Cape Town, South Africa. *Childhood Obesity* 2014; 10:501-510.
Tomaz SA, Jones RA, Hinkley T, Twine R, Kahn K, Norris SA, Draper CE. Physical activity in early childhood education and care settings in a low-income, rural South African community: an observational study. *Rural and Remote Health*. 2019;19:5249.

Low-income settings



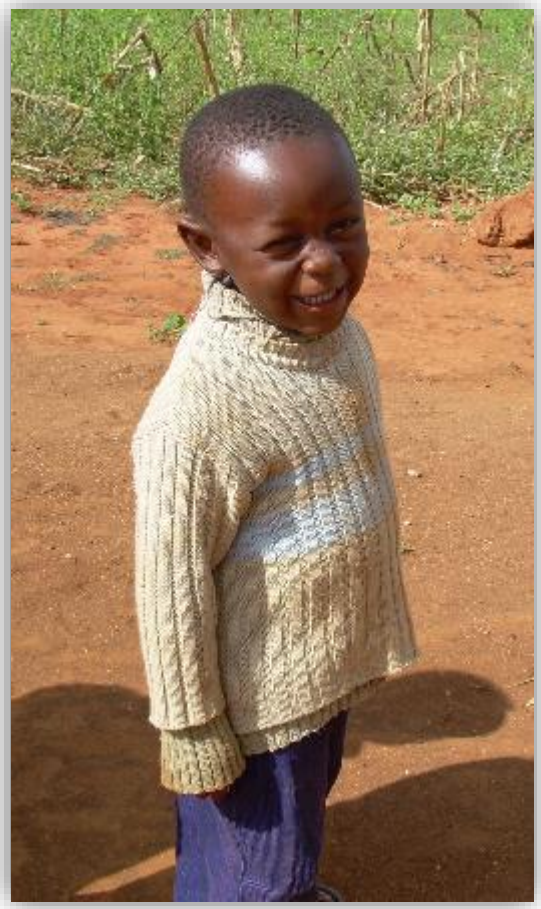
High-income settings






Adiposity

- Double burden of over- and undernutrition
  - Nutrition transition and obesogenic urban environments
  - Food insecurity – urban and rural
- More low-income urban children who are overweight/obesity, and higher BMI-for-age z scores
- Higher undernutrition in low-income rural children
- Complicated association between nutritional status and physical activity



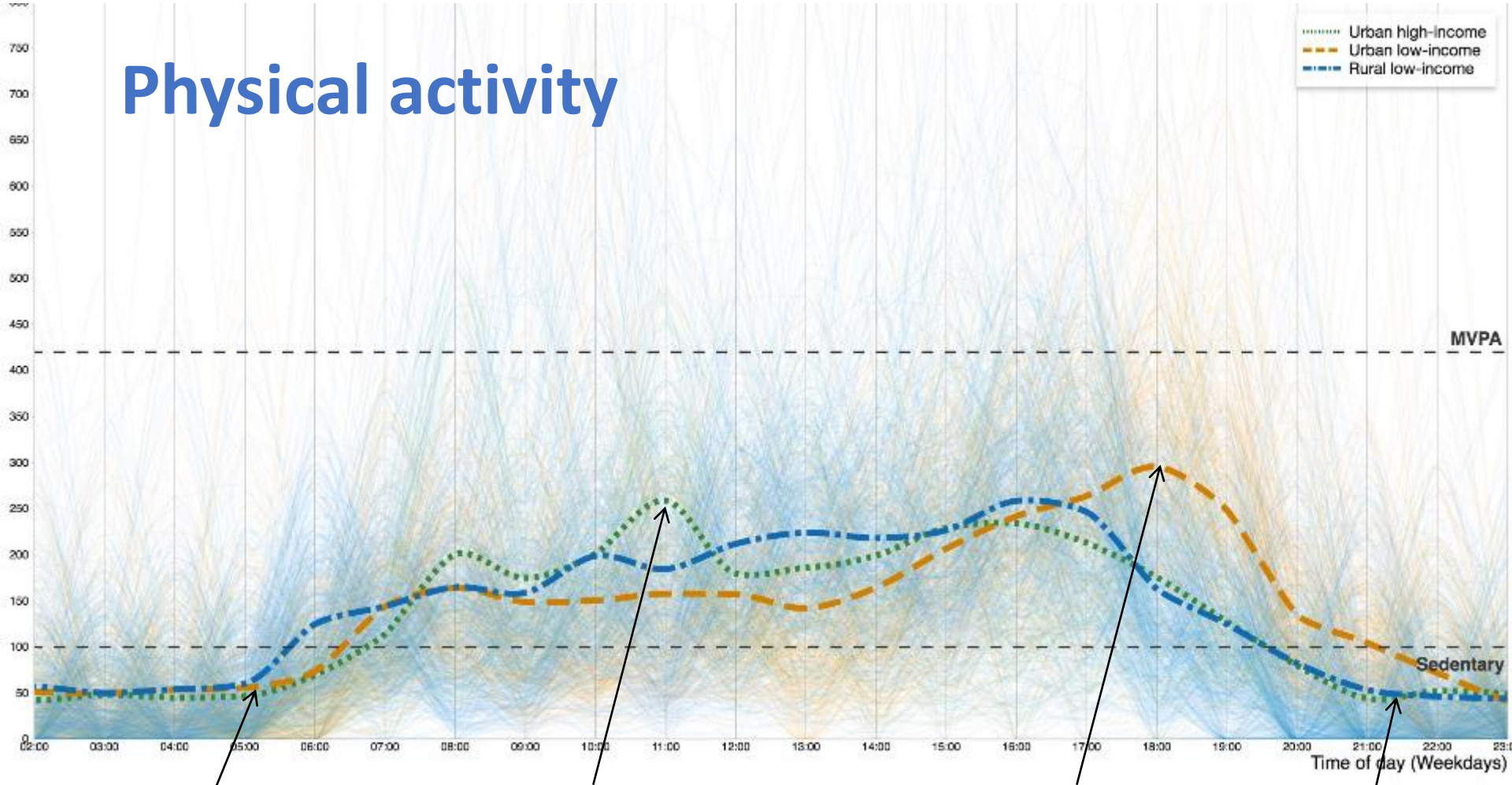
Draper CE, Tomaz SA, Hinkley T, Jones RA, Twine R, Kahn K, Norris SA. Cross-sectional associations of physical activity and gross motor proficiency with adiposity in South African children of pre-school age. *Public Health Nutrition.* 2019; 22(4): 614-623.

Physical activity

- Cut-points:
  - Light-intensity physical activity: ≥25 counts/15s
  - MVPA: >420 counts/15s
- 96% met guideline (180 mins/day, including 60 min MVPA); 100% got 180 mins/day
- Average total physical activity: 457.0±61.1 mins/day
- Average MVPA: 124.4±37.5 mins/day
- Boys did significantly more MVPA than girls (136.7±39.37 vs. 111.5±30.70 mins/day, $p<0.001$)
- Urban high-income pre-schoolers significantly less active (409.1±48.4) than urban low-income (471.1±55.6) and rural low-income pre-schoolers (461.6 ± 61.4; $p<0.001$)

Tomaz SA, Jones RA, Hinkley T, Twine R, Kahn K, Norris SA, Draper CE. Objectively measured physical activity in SA children attending preschool and Grade R: Volume, patterns and meeting guidelines. In press: *Pediatric Exercise Science.*

Physical activity



Rural kids get up earlier

High-income urban kids have more variety in their preschool day, compared to kids in low-income preschools

Surge of evening activity for kids in a low-income community

Average bedtimes between 9pm - 10pm

Tomaz SA, Jones RA, Hinkley T, Twine R, Kahn K, Norris SA, Draper CE. Objectively measured physical activity in SA children attending preschool and Grade R: Volume, patterns and meeting guidelines. In press: *Pediatric Exercise Science.*

Gross motor skills

GMQ categories %	Total sample (n=258)	Urban high-income (n=46)	Urban low-income (n=91)	Rural low-income (n=121)
Very poor, poor & average	7	2.2	6.6	9.1
Average	60.5	73.9	71.4	47.1
Above average, superior & very superior	32.7	23.9	22	43.8

- Rural low-income children performed better than urban low-income (p=0.009) and high-income children (p=0.028)
- Do children really need equipment and instruction to develop gross motor skills at this age?

Tomaz SA, Jones RA, Hinkley T, Bernstein SL, Twine R, Kahn K, Norris SA, Draper CE. Gross motor skills of South African preschool-aged children across different income settings. *Journal of Science and Medicine in Sport.* 2019; 22:689-694.

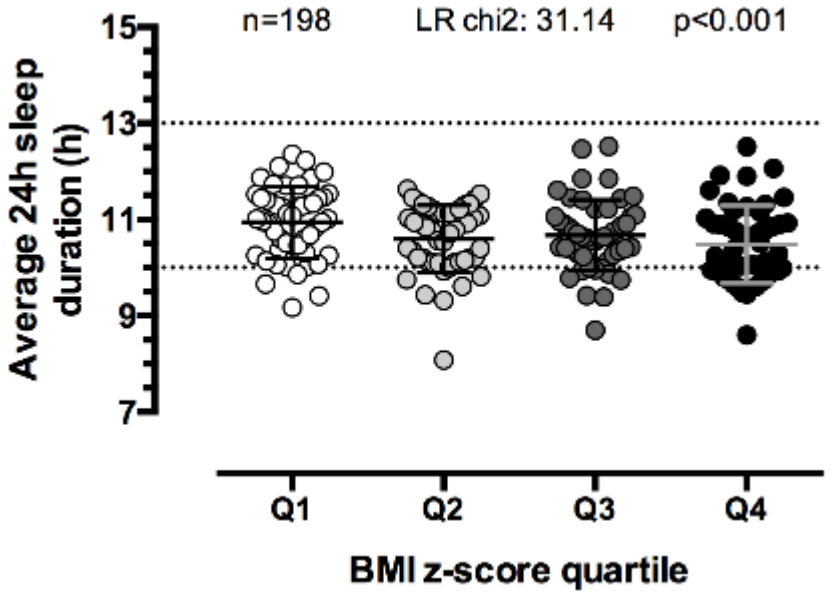
Screen time

- Parent questionnaire: urban high-income (n=27), urban low-income (n=96), rural low-income (n=142)
- Exceeding screen time guidelines:
  - 67% urban high-income
  - 26% urban low-income
  - 3.5% rural low-income
- Only 50% of urban high-income parents thought that screen time would not affect their pre-schooler's health compared to urban low-income (90.4%) and rural low-income (81.7%) parents

Tomaz SA, Jones RA, Hinkley T, Watson E, Twine R, Kahn K, Norris SA, Draper CE. Screen time and sleep of SA preschool-aged children. In review.

Sleep

- Biggest issue in urban low-income settings
  - Late bedtimes
  - Lack of bedtime routines
  - Overcrowding – room and bed sharing
- Shorter sleep significantly associated with higher BMI-for-age z score, despite high levels of physical activity

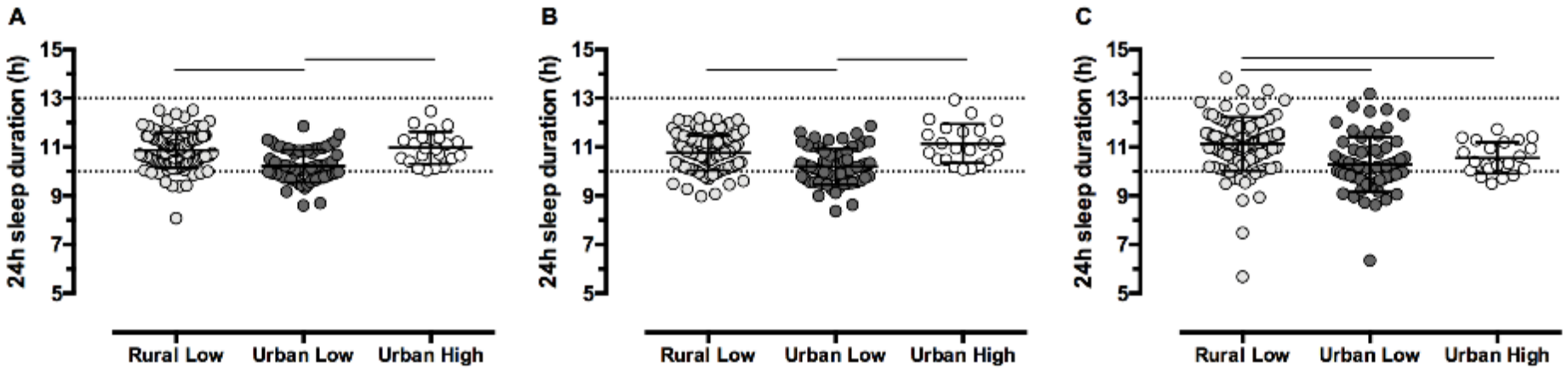


Association between 24h sleep duration and BMI z-score quartiles

Individual data points and mean±SD are presented. Dotted lines at 10h and 13h represent the recommended sleep duration range for preschoolers. Q1: lowest BMI z-score quartile, Q4: highest quartile.

Tomaz SA, Jones RA, Hinkley T, Watson E, Twine R, Kahn K, Norris SA, Draper CE. Screen time and sleep of SA preschool-aged children. In review.

Rae D, Tomaz SA, Jones RA, Hinkley T, Twine R, Kahn K, Norris SA, Draper CE. Sleep and BMI in South African urban and rural, high- and low-income preschool children. In review: *Childhood Obesity*.

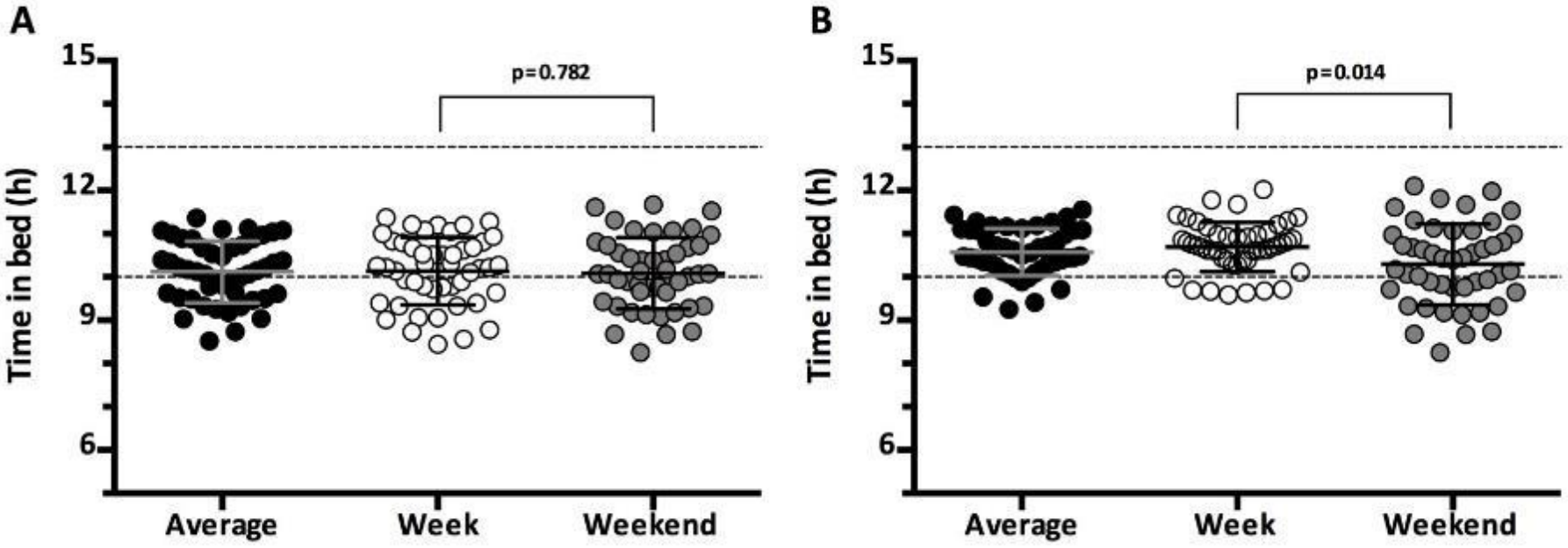


Average (A), week (B) and weekend (C) 24h sleep durations for all three groups

Individual data points and mean±SD are presented. Dotted lines at 10h and 13h represent the recommended sleep duration range for preschoolers. Solid lines indicate post hoc differences between groups following a one-way ANOVA.

- Compared to rural low-income and urban high-income children, urban low-income children had:
  - Later bedtimes ($p<0.001$) and wake-up times ($p<0.001$)
  - Shorter 24h ($p<0.001$) and nocturnal ($p<0.001$) sleep durations

Sleepless in Soweto



Average weekday and weekend nocturnal (A) and 24h (B) sleep durations (n=47)

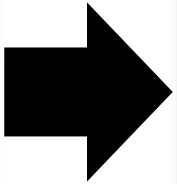
Tomaz SA, Prioreschi A, Watson ED, McVeigh JA, Khan T, Rae DE, Jones RA, Draper CE. Body mass index, physical activity, sedentary behavior, sleep, and gross motor skill proficiency in preschool children from a low- to middle-income urban setting. *Journal of Physical Activity and Health*. 2019; 16(7):525-532.

Qualitative findings

- Parents/caregivers and teachers generally positive about movement behaviours in preschool children
- Child development more salient than physical health
  - But limited agency about parents' role
- Receptive to intervention
- Big gaps in knowledge amongst caregivers (especially screen time), but keen to learn
- Screen time a major problem, including in some rural areas

Draper CE, Tomaz SA, Stone M, Hinkley T, Jones RA, Louw J, Twine R, Kahn K, Norris SA. Developing intervention strategies to optimise body composition in early childhood in South Africa. *Biomed Research International.* 2017; 2017:1-13.
Tomaz SA, Okely AD, van Heerden A, Vilakazi K, Samuels ML, Draper CE. The South African 24-hour Movement Guidelines for Birth to Five Years: Results from the stakeholder consultation. *Journal of Physical Activity and Health*. 2020;17:126-137.

How and where to intervene?



A shift to a more holistic focus on development

Draper CE, Tomaz SA, Stone M, Hinkley T, Jones RA, Louw J, Twine R, Kahn K, Norris SA. Developing intervention strategies to optimise body composition in early childhood in South Africa. *Biomed Research International.* 2017; 2017:1-13.

NURTURING CARE
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IN SUPPORT OF EVERY WOMAN EVERY CHILD

A FRAMEWORK FOR HELPING CHILDREN **SURVIVE** AND **THRIVE** TO **TRANSFORM** HEALTH AND HUMAN POTENTIAL

Amagugu Asakhula

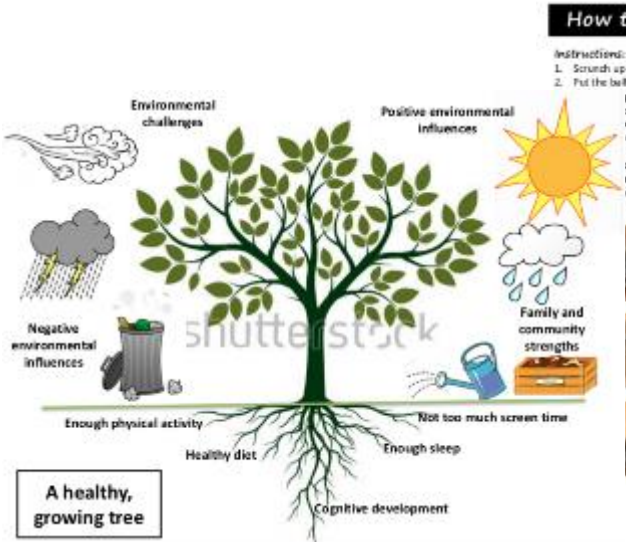
DST/NRF Centre of Excellence in Human Development

Individual and Society

Amagugu Asakhula

Training manual

‘Treasures that are still growing’



	Monday	Tuesday	Wednesday
Having less than 1 hour of screen time per day	*		*
Getting to bed at the time decided by the caregiver		*	*
Not having any chips or sweets on that day	*		*

Amagugu Asakhula

- Delivered by community health workers
- 6 one-on-one sessions in the home
- Activities embedded in sessions to:
  - Promote physical activity
  - Develop fine and gross motor skills
  - Promote early learning (specifically numeracy and literacy)
  - Create opportunities for nurturing interactions
- Piloted in Nyanga, Cape Town (NGO) and Soweto, Johannesburg (primary health care setting)
  - Generally acceptable to caregivers; mostly positive perceptions
  - Implementation more feasible with NGO partnership, rather than through health services

Draper CE, Howard SJ, Rochat TJ. Feasibility and acceptability of a home-based intervention to promote nurturing interactions and healthy behaviours in early childhood: the *Amagugu Asakhula* pilot study. *Child: Care, Health and Development.* 2019:45:823-831.

Pilot study findings: Cape Town

- Generally implemented as intended
- Caregivers viewed programme as important
- Engaged children, plus some other family members
- Perceived benefits:
  - Awareness and knowledge about health behaviours
  - Awareness of their role in their child's development
  - Changes in behaviours, e.g. diet, sleeping, reading to child, reducing screen time
  - Connection between caregiver and child

Draper CE, Howard SJ, Rochat TJ. Feasibility and acceptability of a home-based intervention to promote nurturing interactions and healthy behaviours in early childhood: the *Amagugu Asakhula* pilot study. *Child: Care, Health and Development.* 2019:45:823-831.

"I normally took a story book. So instead of us watching TV, we would be in bed reading a book. And I would later on see, 'hayibo, she's sleeping mos!' And then I think she got used to it very quick, because she would take a book and… 'let's read mommy', switch off the TV, no phones, no nothing. After reading, it's time for sleep. We sleep. And I also slept just because I wanted to sleep. And eventually when she's sleeping, then I can turn on the TV and just watch." (CG)

"It strengthened the relationship with my child, firstly. Because I would take her to school, come back, watch TV. Our relationship was not as strong as it is now. So the programme, it made it strong…now we would bond over a book, and play games with the flashcards…Because she would normally tell me things that happened at school, and like before the programme she'd never…like I would ask 'how was your day?'…'fine'. 'What happened?' 'Nothing'. But now she would like 'yho mommy, this happened…my teacher said this, my teacher did this.' And I would keep the conversation coming." (CG)

"What I liked most about the sessions, there was a lot of bonding involved, and there's a lot of getting to understand your child better, and knowing what your child is good at. I think what they like, reading to each other, at that time you get to explore different channels and realise the things you probably didn't know before." (CG)

Parents' perspectives – Soweto

- Limited agency regarding behaviours and choices relating to weight and health
  - Feel constrained by environmental factors
- Varying degrees of awareness of health-related behaviours
  - Health not necessarily the guiding principle in how parents made decisions that related to pre-schoolers' health behaviours
  - Also influenced by practicality, financial constraints, aspirations, pressures
- Other key concerns, e.g. unemployment and poverty
- Parents want their children to learn, develop, and feel happy and loved
  - Interventions should promote nurturing care in a way that ultimately also promotes healthier habits

Klingberg S, van Sluijs EMF, Draper CE. "The thing is, kids don't grow the same": parent perspectives on preschoolers' weight and size in Soweto, South Africa. *PLOS ONE.* 2020;15: e0231094.
Klingberg S, van Sluijs EMF, Draper CE. "Can you imagine the pressure?" A qualitative exploration of parent perspectives on preschoolers' movement and dietary behaviours, and barriers and facilitators to healthy habits in Soweto, South Africa. In review: *Public Health Nutrition.*

Cognitive development

- Executive function (including attention)
- School readiness
- Self-regulation
- How it relates to physical activity, gross motor skills and adiposity

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Executive function – what is it?

- Executive function: mental processes required when you need to pay attention and concentrate
  - Inhibition control, working memory, cognitive flexibility
  - Key component of cognitive function in preschool years
  - Predicts numerous positive outcomes in later life, including school readiness
  - Contributes to self-regulation
  - Typically compromised in low-income settings
- Some evidence for a relationship between executive function and physical activity, but depends on type and context
- Inadequate sleep associated with emotional regulation problems, as well as poor mental health, cognitive and academic outcomes

Executive function study

- Aimed to improve understanding of executive function, and how it relates to school readiness, and aspects of preschool children's physical activity and gross motor skills, in low-income settings
- Sample and settings:
  - 3-6 year old children at preschool
  - Soweto, Johannesburg (n=66); Bushbuckridge, Mpumalanga (n=72)
- Assessment tools:
  - Accelerometry (Actigraph GT3X+)
  - Test of Gross Motor Development – Version 2
  - Early Years Toolbox
  - Attention assessment (adapted for South Africa)
  - School readiness assessment (adapted for South Africa)

Cook CJ, Howard SJ, Scerif G, Twine R, Kahn K, Norris SA, Draper CE. Associations of physical activity and gross motor skills with executive function in preschool children from low-income SA settings. *Developmental Science*. 2019; e12820.

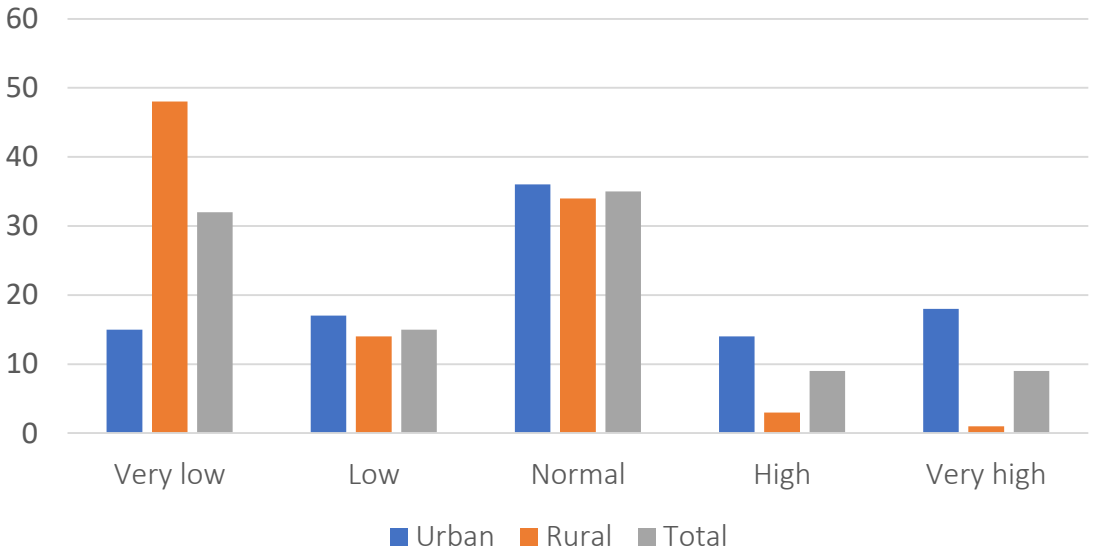
Early Years Toolbox

- Set of iPad assessments
- Executive function:
  - Inhibition control
  - Working memory
  - Cognitive flexibility
- Child Social Behaviour Questionnaire:
  - Cognitive, behavioural and emotional self-regulation
  - Sociability and prosocial behaviour
  - Internalizing and externalising behaviour
- In-app narration translated into 5 South African languages

Howard SJ, Melhuish E. An Early Years Toolbox (EYT) for assessing early executive function, language, self-regulation, and social development: validity, reliability and preliminary norms. Journal of Psychoeducational Development. 2017. 35(3):255-275.

Results

- Similar levels of physical activity and gross motor skill proficiency to previous studies
- Inhibition control and working memory significantly positively associated with gross motor skills
- Did not see expected association between physical activity and executive function



School readiness, by category

Cook CJ, Howard SJ, Scerif G, Twine R, Kahn K, Norris SA, Draper CE. Associations of physical activity and gross motor skills with executive function in preschool children from low-income SA settings. *Developmental Science*. 2019; e12820.

Cross-cultural comparisons

- 3-5 year olds in South Africa (n=155) and Australia (n=937)
- Compared SES quintiles 1, 3 and 5
- Expected SES gradient in executive function in each country
- South African children performed better than Australian children on working memory ($p=0.027$), inhibition ($p<0.001$), and cognitive flexibility ($p<0.001$)
- Q1 South African children outperformed –
  - Q1 Australian children on inhibition ($p<0.001$) and cognitive flexibility ($p=0.001$)
  - Q3 Australian children on inhibition and cognitive flexibility ($p<0.05$)
  - Q5 Australian children on inhibition ($p<0.05$)

Howard SJ, Cook CJ, Everts L, Melhuish E, Scerif G, Norris SA, Twine R, Kahn K, Draper CE. Challenging SES: A cross-cultural comparison of early executive function. *Developmental Science*. 2019; e12854.

We didn’t forget about physical activity ☺

24-hour movement guidelines

- First of any movement behaviour guidelines in South Africa
- Low awareness about the importance of movement behaviours for the physical, mental and cognitive health of young children
- Consensus panel:
  - Government representatives, ECD experts, NGO representatives, health practitioners, and researchers
- Stakeholder consultation:
  - Parents/caregivers, ECD practitioners, community workers, health professionals, education professionals, researchers, national government and NGOs

Draper CE, Tomaz SA, Biersteker L, Cook CJ, Couper J et al. The South African 24-hour Movement Guidelines for Birth to Five Years: an integration of physical activity, sitting behaviour, screen time and sleep. *Journal of Physical Activity and Health*. 2020;17:109-119.
Tomaz SA, Okely AD, van Heerden A, Vilakazi K, Samuels ML, Draper CE. The South African 24-hour Movement Guidelines for Birth to Five Years: Results from the stakeholder consultation. *Journal of Physical Activity and Health*. 2020;17:126-137.

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CHANGING THE WAY SOCIETY TREATS ITS CHILDREN AND YOUTH

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SOUTH AFRICAN 24-HOUR MOVEMENT GUIDELINES FOR BIRTH TO FIVE YEARS

An integration of physical activity, sitting behaviour, screen time and sleep

Why are 24-hour movement guidelines important for children from birth to 5 years?

These are the first guidelines targeting physical activity, sitting behaviour, screen time and sleep in South African children. They have been developed in response to the research that shows how these movement behaviours are linked to healthy growth and physical development, as well as cognitive, social and emotional development in children from birth to 5 years.

These guidelines recommend that children from birth to 5 years should participate in a range of play-based and structured physical activities that are appropriate for their age and ability, and that are fun and safe. Children should be encouraged to do these activities independently as well as with adults and other children. Caregivers should engage in activities that are loving, and involve play and talking with children.

These guidelines also emphasise that the quality of what is done when sitting matters. For children younger than 2 years, screen time is NOT recommended. For children aged 2-5 years, sitting activities that are screen-based should be limited. The quality of sleep in children from birth to 5 years is also important, and screen time should be avoided before bed. Family members should be encouraged to avoid using screens in shared sleeping areas, especially while children are falling asleep.

Children from birth to 5 years who receive support to meet these movement guidelines are likely to grow up healthier, fitter and stronger. They may also have greater motor skill abilities, be more prepared for school, manage their feelings better, and enjoy life more. The benefits of following these guidelines are greater than the potential harms.

Who are these guidelines for?

These guidelines are for those who have an interest in the health and development of all children from birth to 5 years, including parents and family, educators, caregivers, health professionals, and community workers. These guidelines should be implemented in homes, early childhood development programmes and centres, or any setting where children may engage in these movement behaviours. They apply to all apparently healthy children from birth to 5 years, children of all abilities, cultural ethnicities, language backgrounds, income settings, and living in all parts of South Africa. For children with a medical condition, it would be best to first consult with a health care professional about how these guidelines should be adapted to suit their specific needs and abilities.

How do these guidelines link to existing policy documents in South Africa?

Road to Health book: Following these guidelines can help children achieve the developmental milestones outlined in the Road to Health book. Both documents recognise the importance of love, play and talking to stimulate children's development and learning from birth.

Paediatric Food-based Dietary Guidelines: Both guidelines promote health, growth and development of children.

National Integrated Early Childhood Development Policy 2015: The principles in these guidelines can improve the quality of early childhood development programmes. Both documents recognise the importance of play for development and learning, and the role of parents in children's early development.

National Curriculum Framework for Children from Birth to Four: These guidelines support the themes of learning and development, strong connections with adults, and the child being a competent person. Following these guidelines contributes to building a strong foundation for lifelong learning in the child.

These guidelines are based on the best available research, expert consensus, stakeholder consultation, and consideration of what is regarded to be important, applicable, feasible and equitable across all South African settings. Furthermore, they are consistent with World Health Organization guidelines.

Further details on how to achieve these guidelines are available at ***www.laureus.co.za.***

A HEALTHY 24-HOUR DAY INCLUDES:

BABIES (BIRTH TO 1 YEAR OLD)

Moving
Being physically active several times a day in a variety of ways through interactive floor-based play, including crawling. For babies not yet mobile, this includes at least 30 minutes of tummy time spread throughout the day while awake, and other movements such as reaching and grasping.

Sitting
Engaging in stimulating activities with a caregiver, such as playing with safe objects and toys, having baby conversations, singing, and storytelling. Babies should NOT be strapped in and unable to move for more than 1 hour at a time (e.g., in a pram, high chair, or on a caregiver's back or chest) while awake. Screen time is NOT recommended.

Sleeping
14 to 17 hours (for babies aged 0-3 months) and 12 to 16 hours (for babies aged 4-11 months) of good quality sleep, including naps in the day. Sleeping may occur while a baby is strapped to a caregiver, or while a baby is being held.

Screens include televisions, cell phones, tablets, video games, and computers.

TODDLERS (1 AND 2 YEARS OLD)

Moving
At least 180 minutes spent in a variety of physical activities including energetic play, spread throughout the day; more is better.

Sitting
Engaging in activities that promote development such as reading, singing, games with blocks, puzzles, and storytelling with a caregiver. Toddlers should NOT be strapped in and unable to move for more than 1 hour at a time (e.g., in a pram, high chair or strapped on a caregiver's back or chest), and should not sit for extended periods. For toddlers younger than 2 years, screen time is NOT recommended. For toddlers aged 2 years, screen time should be no more than 1 hour; less is better.

Sleeping
11 to 14 hours of good quality sleep, including naps in the day, with consistent sleep and wake-up times.

PRE-SCHOOLERS (3, 4 AND 5 YEARS OLD)

Moving
At least 180 minutes spent in a variety of physical activities, of which at least 60 minutes is energetic play that raises their heart rate and makes them 'huff and puff' (e.g. running, jumping, dancing), spread throughout the day; more is better.

Sitting
Engaging in activities such as reading, singing, puzzles, arts and crafts, and storytelling with a caregiver and other children. Pre-schoolers should NOT be strapped in and unable to move for more than 1 hour at a time and should not sit for extended periods. Screen time should be no more than 1 hour per day; less is better.

Sleeping
10 to 13 hours of good quality sleep, which may include a nap, with consistent sleep and wake-up times.

Helping children from birth to 5 years to stick to these guidelines may be challenging at times! For children who are not meeting these guidelines, it is recommended that small changes are made to help them start working towards what is stated in these guidelines.

To further support children from birth to 5 years in their movement behaviours over a 24-hour day, encourage them to do more energetic play, choose age-appropriate, interactive sitting activities instead of sitting or lying in front of a screen, and to get enough sleep. This will help them enjoy greater benefits to their health and development.

"Our children are the rock on which our future will be built, our greatest asset as a nation." Nelson Mandela

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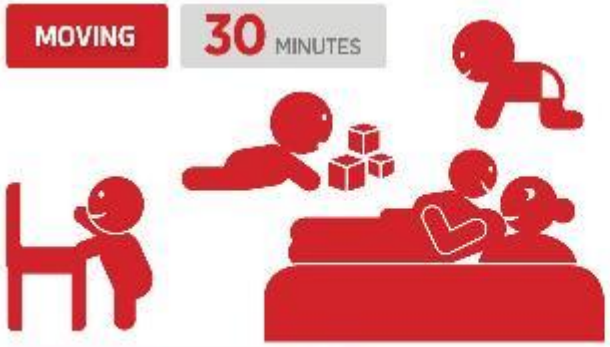
A HEALTHY 24-HOUR DAY INCLUDES...

BABIES (BIRTH TO 1 YEAR)

MOVING 30 MINUTES



SITTING ✓ ✗ 0 HOURS

SLEEPING

0-3 MONTHS **14-17** HOURS

4-11 MONTHS **12-16** HOURS

TODDLERS (1 & 2 YEARS)

MOVING 3 HOURS

SITTING ✓ ✗

12-24 MONTHS **0** HOURS

24-36 MONTHS **1** HOUR OR LESS

SLEEPING 11-14 HOURS

PRE-SCHOOLERS (3, 4 & 5 YEARS)

MOVING 3 HOURS

SITTING ✓ 1 HOUR OR LESS

SLEEPING 10-13 HOURS

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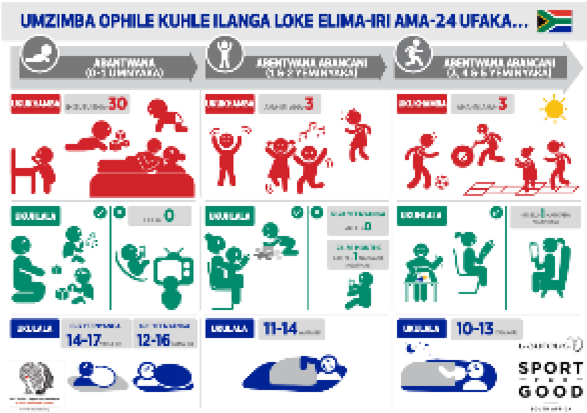
Laureus SPORT FOR GOOD SOUTH AFRICA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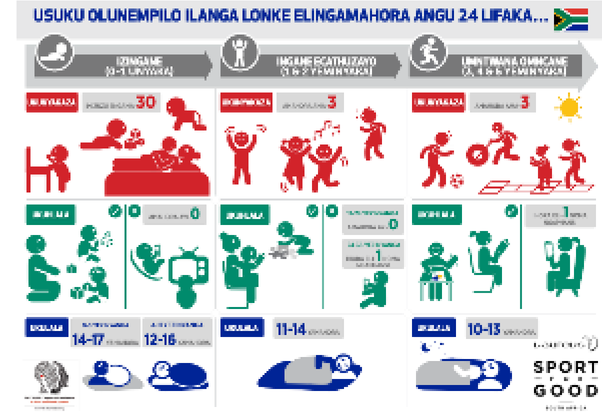
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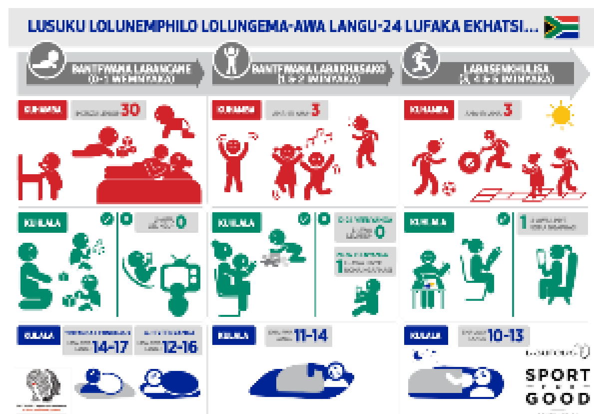
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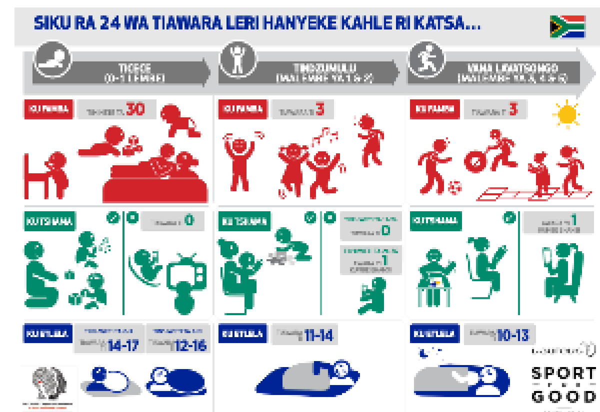
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GOOD

Guideline dissemination

- Printed guidelines distributed as widely as possible
- But how do we get these resources and messages into the hands of those who care for 0-5 year old children?
- Workshops with community-based organisations:
  - ‘Train-the-trainer’ model
  - Used existing networks and contact lists from ECD organisations to invite organisations
  - Open to anyone who was interested: teachers/practitioners, parents/caregivers, health professionals, government departments
  - Conducted in 7 of the 9 South African provinces (September 2019)
  - Printed resources provided
  - Survey completed and ‘focus group’ discussions held after most workshops

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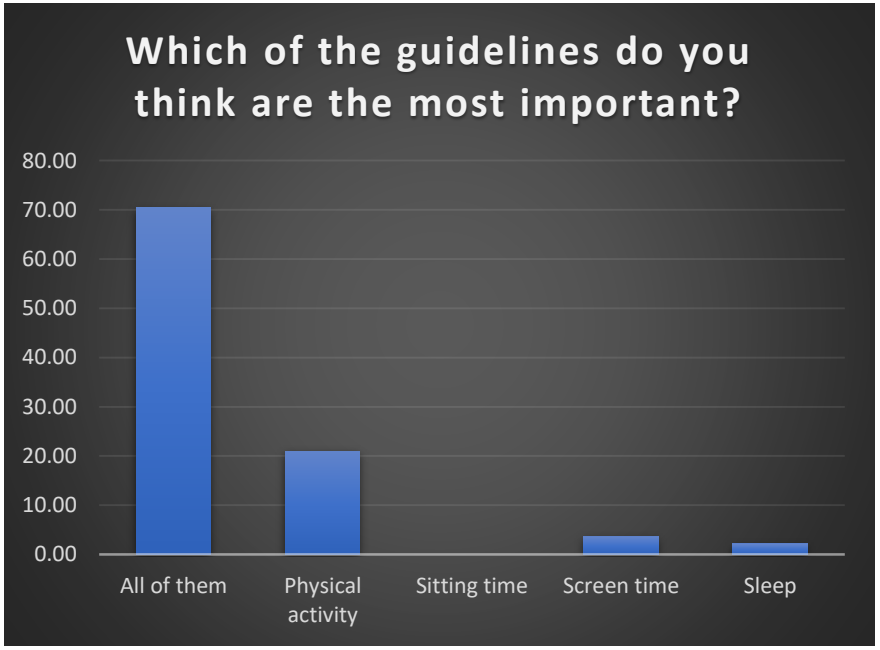
Guideline dissemination

- Generally positive about the guidelines and the workshops
- Highlighted the key role of parents
- Challenges to implementation:
  - Parenting has changed (families more child-centred); parents are busy; need guidance on managing screen time (theirs as well)
  - Broader social challenges, e.g. safety, poverty, poor nutrition
  - Resource challenges
- Follow-up focus groups planned (COVID-19…)



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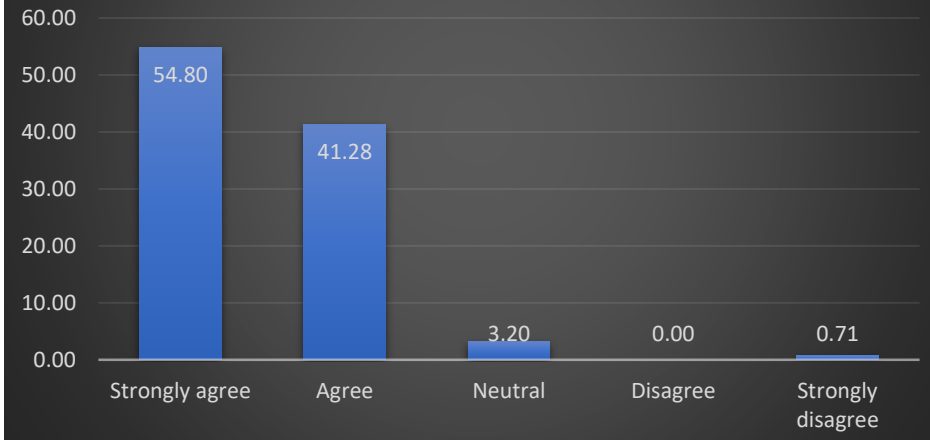
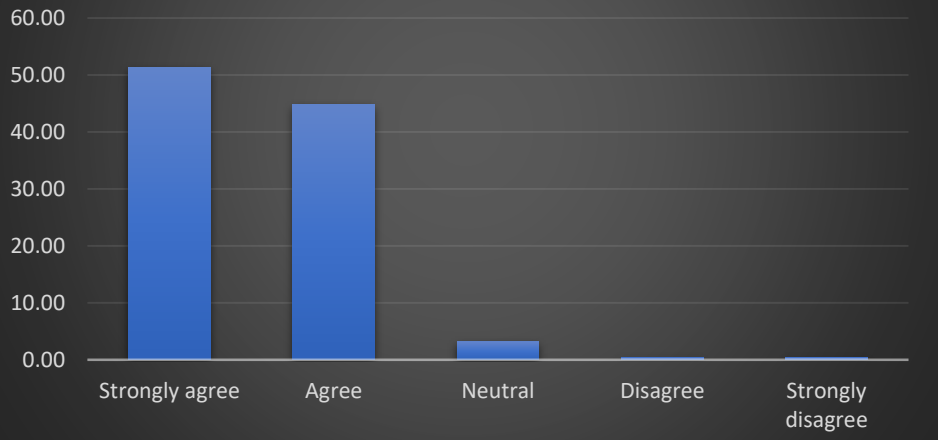
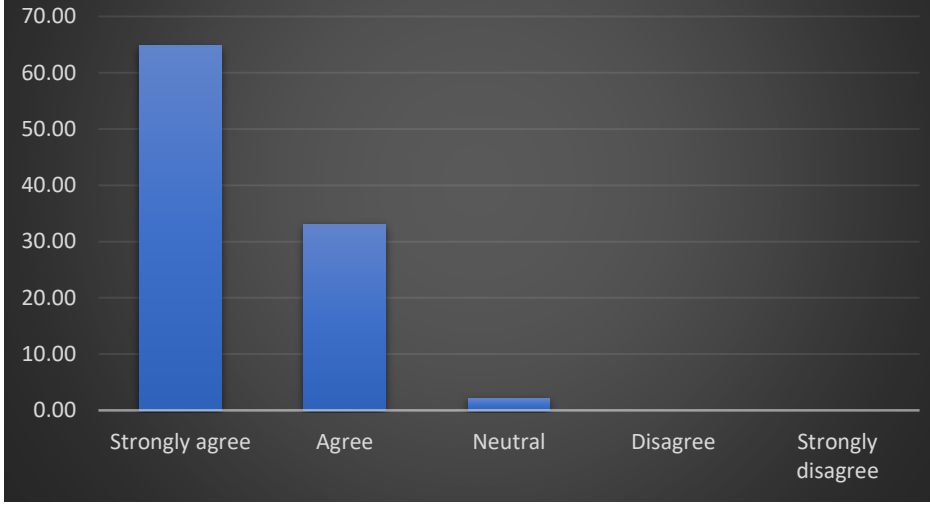
The workshop helped me to understand 24-hour movement behaviours



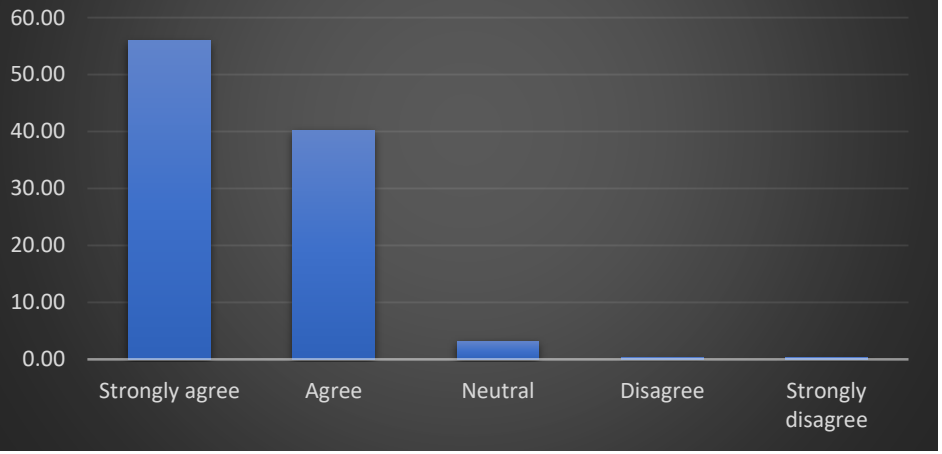
The workshop helped me to understand how to share the guidelines with others



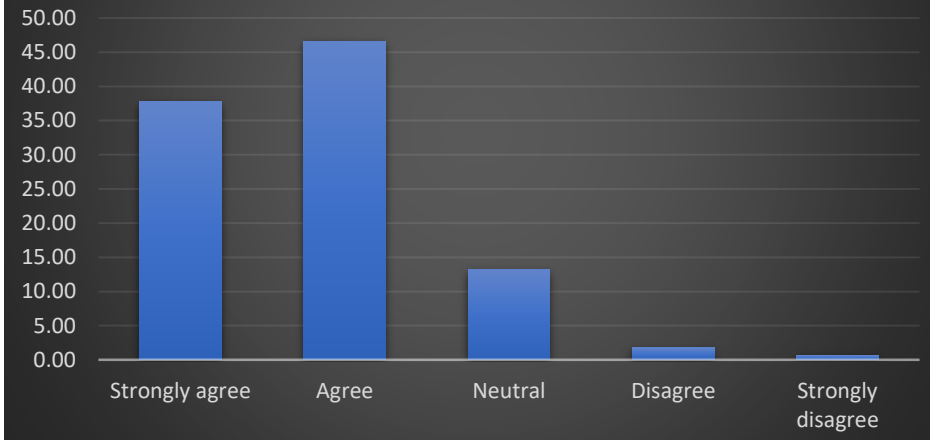
I think these guidelines are needed in South Africa



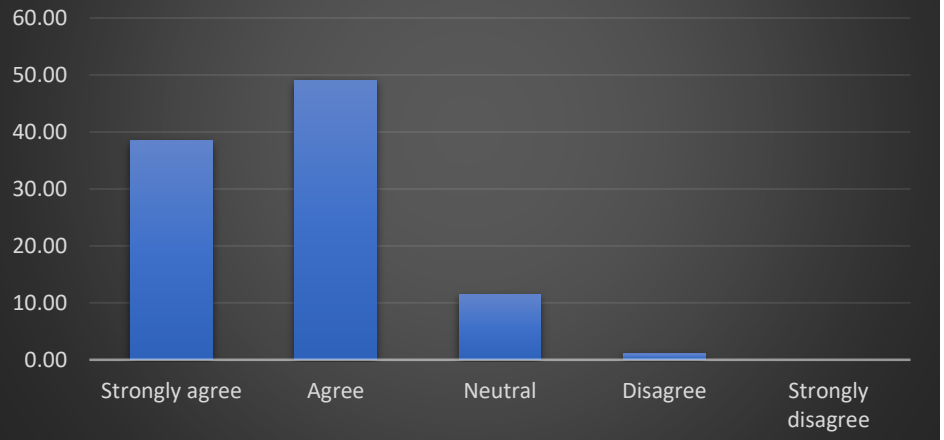
The workshop helped me to see the importance of healthy movement behaviours in young children



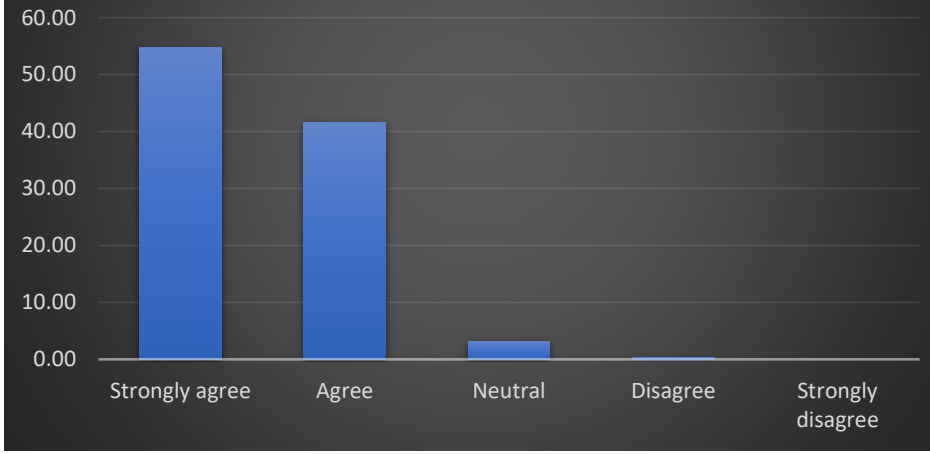
I have the resources I need to promote the guidelines with the people I work with



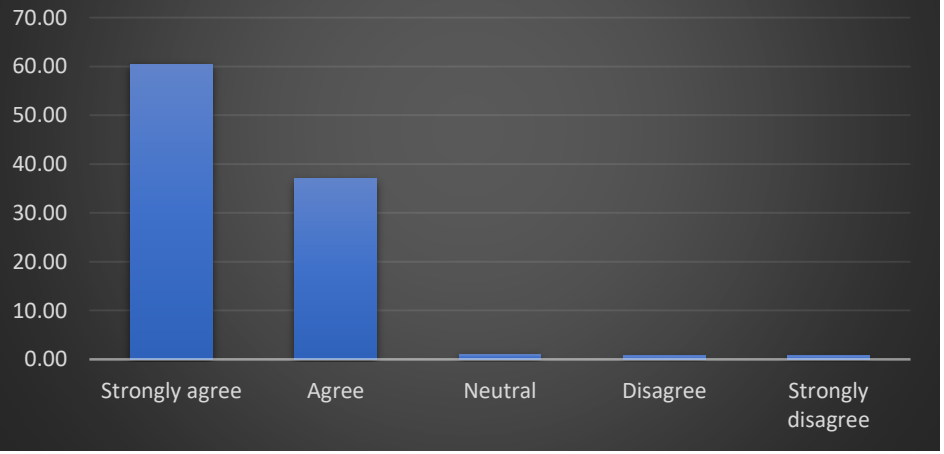
I have the support I need to promote the guidelines with the people I work with



I feel confident that I can share these guidelines with the people I work with



I would recommend this workshop to others who work with carers of children from birth to 5 years



Guideline dissemination

- Brought in some marketing and creative expertise (“sizzle”) to help us with our brand and campaign to disseminate the guidelines in more creative ways

CREATRIX
on your terms on your turf in your lingo

telling *your* brand's story
COVID-19 info

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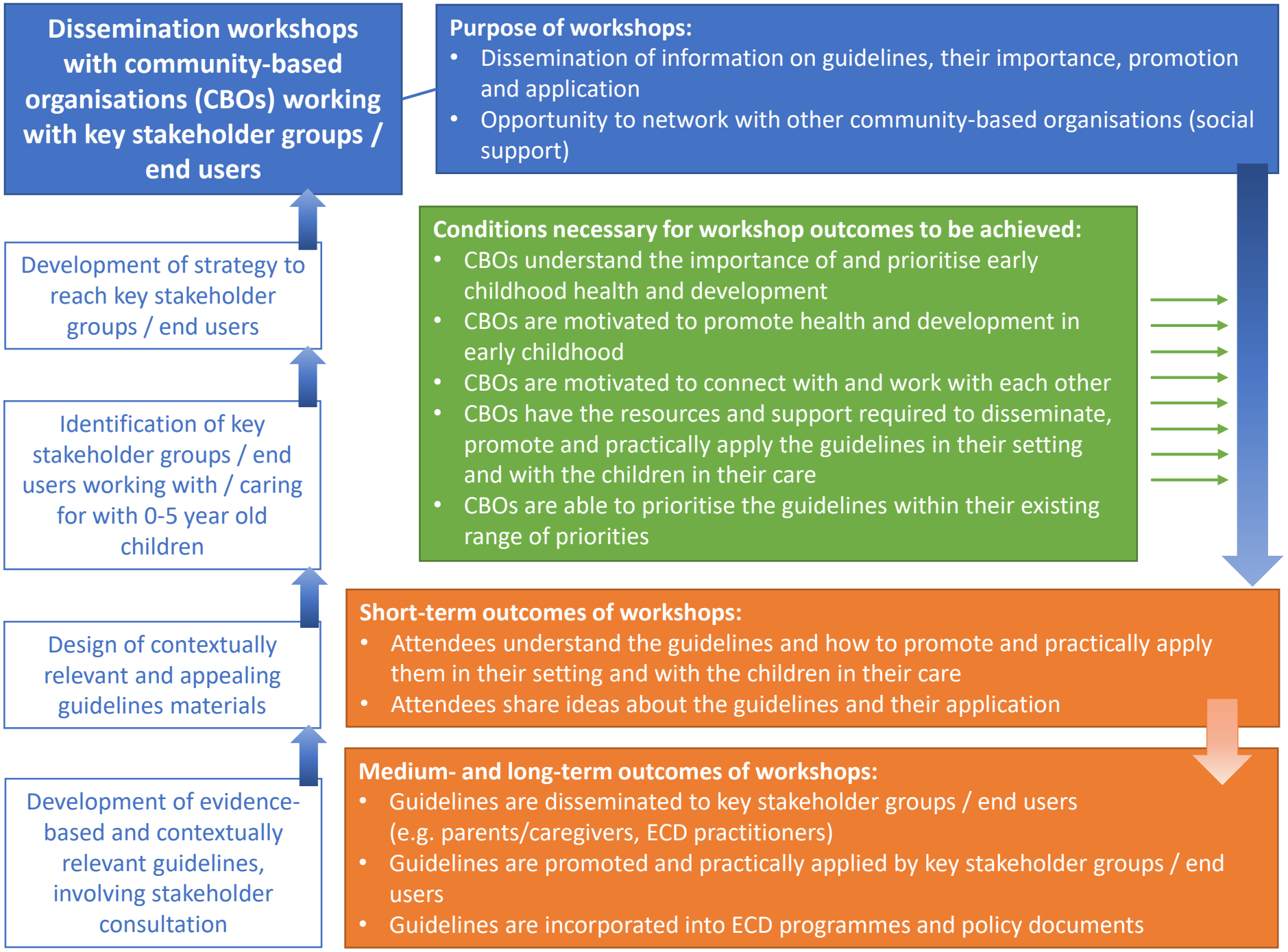
South African Early Years Movement Guidelines

- Means ‘Come here, child’
- Philosophy: to create connection between young children and their caregivers to engage in behaviours that promote their health and development.

- Logo created from elements and shapes that are used in the guideline’s infographic, also using South African flag colours
- Shapes overlap to create letters, reminiscent of arms, legs, heads and cartoon like ‘movement’ lines of emphasis

www.youtube.com/watch?v=R-4WNhWO9TE


Dissemination workshops with community-based organisations (CBOs) working with key stakeholder groups / end users
Purpose of workshops:
• Dissemination of information on guidelines, their importance, promotion and application
• Opportunity to network with other community-based organisations (social support)
Development of strategy to reach key stakeholder groups / end users
Identification of key stakeholder groups / end users working with / caring for with 0-5 year old children
Design of contextually relevant and appealing guidelines materials
Development of evidence-based and contextually relevant guidelines, involving stakeholder consultation
Conditions necessary for workshop outcomes to be achieved:
• CBOs understand the importance of and prioritise early childhood health and development
• CBOs are motivated to promote health and development in early childhood
• CBOs are motivated to connect with and work with each other
• CBOs have the resources and support required to disseminate, promote and practically apply the guidelines in their setting and with the children in their care
• CBOs are able to prioritise the guidelines within their existing range of priorities
Short-term outcomes of workshops:
• Attendees understand the guidelines and how to promote and practically apply them in their setting and with the children in their care
• Attendees share ideas about the guidelines and their application
Medium- and long-term outcomes of workshops:
• Guidelines are disseminated to key stakeholder groups / end users (e.g. parents/caregivers, ECD practitioners)
• Guidelines are promoted and practically applied by key stakeholder groups / end users
• Guidelines are incorporated into ECD programmes and policy documents

WHO Global 24-hour Movement Guidelines for the Early Years

Willumsen J, Bull F. Development of WHO guidelines on physical activity, sedentary behavior, and sleep for children less than 5 years of age. Journal of Physical Activity and Health 2020;17(1):96-100.

SUNRISE

International Surveillance Study of 24-hour movement behaviours in the Early Years

- Primary aim: determine the proportion of children sampled in participating countries who meet the WHO Global 24-hour Movement Guidelines for the Early Years
- Secondary aims:
  - Determine if these proportions differ by sex, or urban/rural location between different levels of human and economic development
  - Assess associations between movement behaviours and indicators of motor and cognitive development
- Anthropometrics, accelerometry (Actigraph + activPAL), motor skills (Ages and Stages Questionnaire-3), executive function (Early Years Toolbox), parent questionnaire
- South Africa one of the first SUNRISE pilot countries
  - Urban Soweto, Johannesburg; rural Sweetwaters, KwaZulu-Natal
  - 89 preschool child/parent pairs

https://sunrise-study.com

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South Africa pilot findings

SUNRISE
International Surveillance Study
of 24-hour movement behaviours in the Early Years

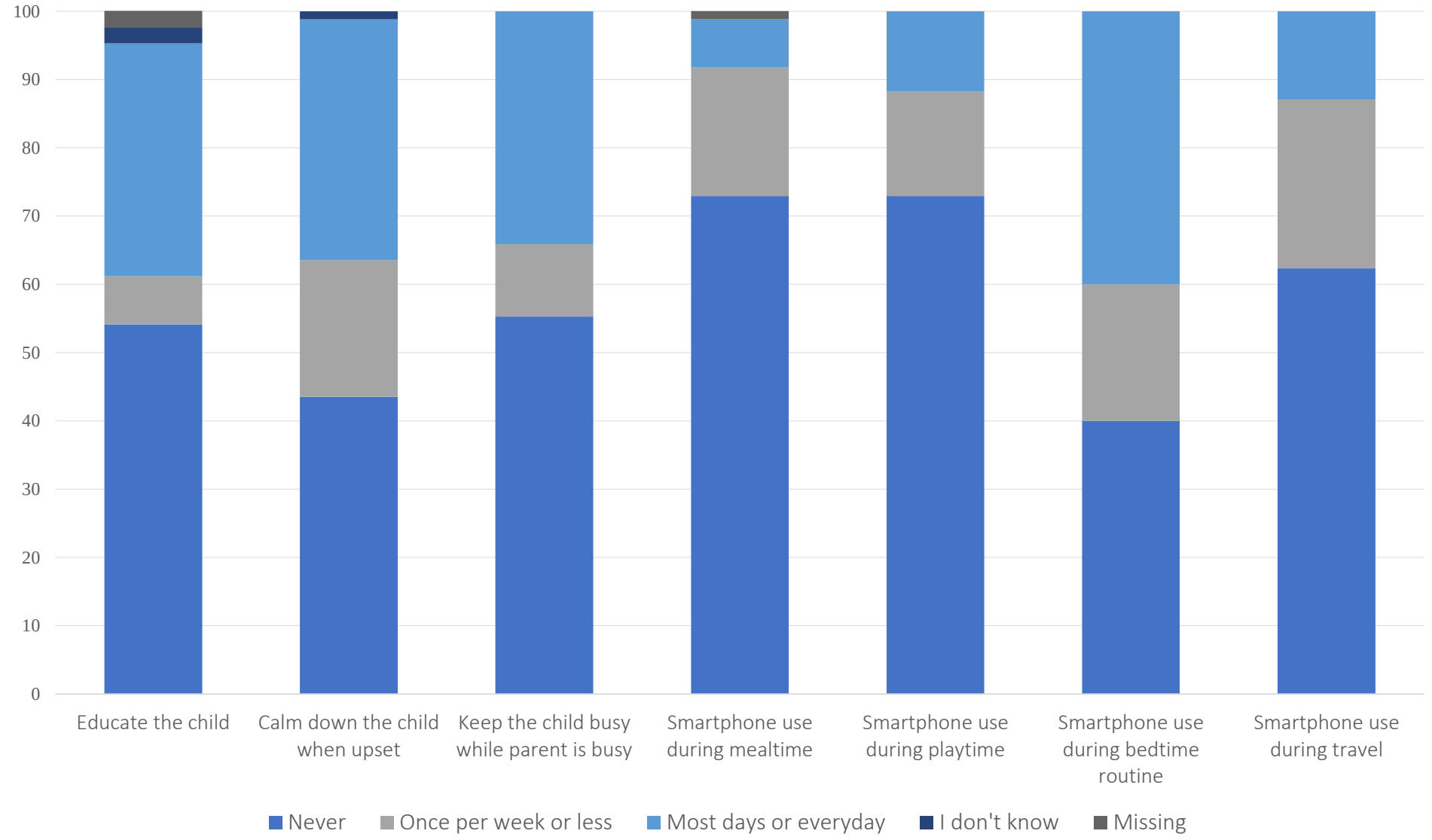
- Total physical activity: 254.4±67.0 mins/day
  - Light-intensity physical activity: ≥200 counts/15s
- MVPA: 127.7±42.7 mins/day
- Meeting guidelines:
  - Physical activity: 83.6%
  - Sleep: 65.8%
  - Screen time: 47.9%
  - 26% met all 3

- Rural children more active, but spent more time on screens
- 96.3% on track for gross motor development; 72.9% on track for fine motor development
- Executive function negatively associated with screen time
- Gross motor skills positively associated with physical activity

Draper CE et al. Understanding the influence of 24-hour movement behaviours on the health and development of preschool children from low-income South African settings: the SUNRISE pilot study. *In preparation.*

HSRC
Human Sciences
Research Council

Screen use in the home



Movement behaviours and COVID-19

Promoting healthy movement behaviours among children during the COVID-19 pandemic

Global movement behaviour guidelines recommend that preschool children (aged 3–4 years) accumulate at least 180 min physical activity, engage in no more than 1 h sedentary screen time, and have 10–13 h good-quality sleep per day. For school-age children and adolescents (5–17 years), the recommendations are to participate in at least 60 min moderate-intensity to vigorous-intensity physical activity, engage in no more than 2 h sedentary recreational screen time, and have 9–11 h good-quality sleep each day.

Children typically obtain their daily physical activity through active travel to school; physical education and recess; organised sports, games, and dance; active play; and spending time in playgrounds and parks. Conversely, most of their sedentary time and sleep are accumulated at home. As a result of the coronavirus disease 2019 (COVID-19) pandemic, opportunities for children to meet the movement behaviour guidelines have been affected by school closures and physical distancing measures implemented by many governments.

To date, we have little evidence to know if, as a result of home confinement, children are spending less time active, going to bed later, and sleeping in later because they do not have to travel to school, or spending more with 15 parents of preschool children in Beijing, China, found that, compared with pre-COVID-19, nearly all children were going to bed later and waking up later. Sedentary screen time had increased and physical activity levels were very low, with children not being allowed outdoors (unpublished data). In South Korea, we surveyed 97 parents of young children between March 27 and 31, 2020; 79 (81%) reported that their children's screen time had increased and 46 (94%) of 49 reported that their children's use of play and sports facilities had decreased.

If this pandemic has reduced healthy movement behaviours among children, we should be concerned for several reasons. First, data from the pre-COVID-19 period show that, on average, only a fifth of preschoolers and less than 10% of school-aged children meet all the movement guidelines.[2] Given the strong associations of health outcomes with movement behaviours,[3,4] children's health will be even more compromised during COVID-19. Second, this period of home confinement—especially if indoors and in small spaces—could lead to higher risk of vitamin D deficiency[5], mental health issues,[6] and myopia.[7] Third, although children seem less susceptible to COVID-19, maintaining or increasing levels of physical activity can reduce their risk of respiratory infections.[8]

Lancet Child Adolesc Health 2020

Published Online
April 29, 2020
https://doi.org/10.1016/S2352-4642(20)30131-0

For **movement behaviour guidelines for preschool children** see https://apps.who.int/iris/handle/10665/311664

For **movement behaviour guidelines for school-age children and adolescents** see https://www.who.int/dietphysicalactivity/factsheet_young_people

For more on **government responses to COVID-19** see https://covidtracker.bsg.ox.ac.uk

For more on **data from South Korea** see https://bit.ly/2ygB8yP

Guan H, Okely AD, Aguilar-Farias N, del Pozo Cruz B, Draper CE et al. Promoting healthy movement behaviours among children during the COVID-19 pandemic. *Lancet Child and Adolescent Health*. 2020; online first.

What now?

- Healthy Life Trajectories Initiative
  - Intervening from preconception (mother) to 5 years old (child) to influence adiposity and development in early childhood
  - Intervention delivered by community health workers
  - Soweto, Johannesburg
- Early learning, particularly executive function and early numeracy
  - Influence of home environment, especially household level SES
  - Stress – piloting feasibility of hair cortisol testing
  - Low-income settings in Cape Town; includes children not in preschool (most vulnerable)

HeLTI
Healthy Life Trajectories Initiative

saMRC
advancinglife

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Thank you

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