

Youth Engagement for Better Outcomes - Social Networks, Physical Activity and Nutrition (YEBO-SPAN): Protocol for “Future-Proofing” South African Adolescents

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Abstract

Background: Adolescence represents a critical period where health behaviours emerge that track into adulthood. In South Africa, 22.4% of girls and 10.2% of boys aged 10-14 years are overweight or obese, with only 40% meeting physical activity recommendations.

Objective: This protocol describes an innovative mixed-methods intervention leveraging participatory citizen science and human-centred design to engage South African adolescents in addressing barriers to healthy lifestyle behaviours.

Methods: The YEBO-SPAN study employs a citizen science “by the people” approach based on the Our Voice global citizen science research method, while also integrating human-centred design principles. Eight high schools in Cape Town were invited to participate in the study, with a focus on Grade 9 learners (14-15 years) who have self-select as Citizen Scientist Explorers (completing self-assessment surveys on lifestyle behaviours and social networks) or Discoverers (engaging in the four-step Our Voice process: Discover, Discuss, Activate, Change). The intervention aligns with the Western Cape Education Department's Life Orientation curriculum. Data collection includes validated instruments for physical activity, dietary patterns, sleep quality, mental wellbeing, and egocentric social network analysis. Citizen scientists used mobile technology for geo-tagged photographic and audio-narrative environmental assessments, followed by participatory workshops to analyse findings, prioritize intervention targets, and develop advocacy strategies. Ripple effects mapping evaluates intended and unintended outcomes.

Results: The intervention started in August 2024 and will conclude in mid-2026. Published study results are expected in early 2026.

Conclusions: This protocol represents the first integration of citizen science and human-centred design in South African schools, generating actionable insights into how environments shape adolescent health behaviours. By embedding the multi-modal procedures within existing curriculum structures and emphasizing youth-led advocacy, the study creates pathways for systems-level impact and horizontal scaling. The approach addresses critical gaps in theory-based, co-created interventions for adolescent

health in low- and middle-income countries while centering voices of those most affected by health inequities. This framework offers a replicable model for youth-engaged health promotion research globally.

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Original Manuscript

Youth Engagement for Better Outcomes – Social Networks, Physical Activity and Nutrition (YEBO-SPAN): Protocol for “Future-Proofing” South African Adolescents

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ABSTRACT:

Background: Adolescence represents a critical period where health behaviours emerge that track into adulthood. In South Africa, 22.4% of girls and 10.2% of boys aged 10-14 years are overweight or obese, with only 40% meeting physical activity recommendations.

Objective: This protocol describes an innovative mixed-methods intervention leveraging participatory citizen science and human-centred design to engage South African adolescents in addressing barriers to healthy lifestyle behaviours.

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Key Words: (3-10 keywords representing the main content of the article)

Youth, Citizen Science, Healthy Eating, Physical Activity, Mental Wellbeing, Social Network, Advocacy, Our Voice citizen science

Introduction

Adolescence (10-24 years) is a critical and formative life stage accompanied by physical, psychological and social development, increasing socialisation with peers and independence outside of the family(1). Behavioural risk factors with implications for adult health begin to emerge before and during adolescence; thus, adolescence is a critical window in which the behaviours that will promote and maintain health across the life course are established (1). World Bank population demographics show that Africa as the youngest of all continents with the highest proportion of the population having an average age of 20 years, more than 40% being under the age of 15 years combined with having the shortest life expectancy (63 years). In South Africa, nearly 30% of the population is under the age of 15 years, with a life expectancy of 64 years and a prevalence of deaths due to (NCDs) of 51%. In children between the ages of 10-14 yrs, 22.4% of girls and 10.2% of boys are overweight or obese(2) and this rises to nearly 40% in young women between the ages of 15-24 years(3). Furthermore, 21% of households in 2021 experienced some level of food insecurity(4) and youth report limited access to affordable, healthy food (5).

Amongst South African youth (defined as any individual under 35 years), just over 40% meet the global recommendations for physical activity (PA) (6). Factors that influence the PA global recommendations for youth include fear for personal safety from crime and traffic, lack of proximity and access to recreational facilities, the absence of physical education and sporting opportunities in school or communities, and socio-cultural influences negatively impact all but utilitarian, transport-related forms of PA(5). More recently, it has become evident that it is not PA alone (daily moderate-to-vigorous PA engagement lasting for a minimum of 60 minutes), but also minimising screen time (to < 2 hr/day) and achieving an adequate amount of good quality sleep (with a goal of 8-10 hr/day), that are all independently associated with positive physical and mental health benefits in adolescents, including academic achievement and quality of life (7, 8). Furthermore, healthy behaviour, in combination with social and environmental determinants, has been shown to extend from adolescence into adulthood (9-12). Social determinants of health (i.e. poverty, access to essential services, education, food security) and health risk factors such as obesity, body composition and relative weight gain may influence both physical and mental well-being, educational attainment, social and cultural capital throughout the life course (9-12). These studies highlight the critical importance of “future proofing” South African youth, to help improve their life expectancy trajectory and quality of life by strengthening their physical and mental well-being to

help them realise their full potential.

Several theory-based interventions in low- and middle- income countries (LMICs) have targeted adolescent health behaviours, in choice-constrained environments., and include a co-creation component(5, 13). Preliminary studies in South African adolescents and young adults have explored both the upstream socioecological and environmental drivers of these health risk behaviours, as well as proximal factors related to the individual, family and social networks. Project Ntshembo (Hope) used intervention mapping to develop a program designed to address environmental, cultural, and individual drivers of obesity in adolescent girls from rural Agincourt(13). Using a theory-backed approach, the proposed intervention was well-received by stakeholders including youth, and proposed “specialist adolescent community health workers to deliver a complex intervention comprising of individual, peer, family and community mobilisation components”. However, this process did not involve the adolescents from the outset. Additionally, the CO-CREATE study set out to “explore the drivers of obesity from adolescents’ perspectives using a systems approach through group model building in four South African schools”(5). Five main themes emerged including: “(i) PA and social media use; (ii) PA, health-related morbidity, and socio-economic status; (iii) accessibility of unhealthy food and energy intake/body weight; (iv) psychological distress, body weight, and weight-related bullying; and (v) parental involvement and unhealthy food intake”.

Even though co-creating knowledge through a participatory approach to develop interventions is not new, a recent systematic review and meta-analysis demonstrated that this method results in significant, but small to moderate improvements in community function, physical and mental health of participants, better health-promoting behaviour, and greater self-efficacy(14). Moreover, there is growing recognition of the importance and effectiveness of youth-led advocacy, in generating health-promoting environments, policies and interventions, that make healthy choices easier for this demographic (15-19).

However, there are limited examples of youth engagement in peer-led programs focused on adolescent health behaviour like the promotion of responsible sexual behaviour, abstinence from tobacco, alcohol or drug use(20, 21), the promotion of PA, and making healthy food choices (18, 19,

22). Moreover, these programs typically focus on individual self-management and behaviour change. Programs such as *Youth Can!* or YEAH! (Youth Engagement and Action for Health)(18, 23) focused on recruiting and training school student leaders to research, operate with a broader vision, training adolescents to advocate for the improvement of the school food environment. The authors concluded that youth leaders can be trained to assess the school food environment and successfully advocate for change "through research and communication, delivering program ideas"(24). Furthermore, studies that suggest participation as a citizen scientist (CS) and youth-led advocacy may result in increased agency and engagement beyond the scope of the original project, described as the "ripple effects" of the study outcome (25).

Recognising the individual, social and environmental factors that place South African adolescents at risk for adult chronic diseases, this study invited adolescents to become CS, to gather evidence and identify factors within their communities, their home, and school environments that facilitate or hinder healthy food choices, opportunities for safe and enjoyable PA, and mental wellbeing. Once identified, alongside the research team, adolescents workshopped to identify and prioritise these factors as a means of identifying targets for co-creating interventions designed to mitigate barriers and promote these inter-related health behaviours.

The final step of this study involves the translation of findings into practice. We will involve CS and educators, in a co-design workshop to develop a prototype of problem-based learning for adolescent advocates to address the food and physical activity environments in their schools and surrounding communities, as part of their curriculum. We will evaluate both the intended and unintended outcomes of the CS, co-production and intervention processes using ripple effects mapping (25).

To strengthen the final step of the study, we ensured that the study outcomes align with the Western Cape Education Department (WCED) Grade 9 Life Orientation (LO) curriculum (Fig. 1). The focus of the Grade 9 LO curriculum is to promote self-motivation and to apply goal-setting, problem-solving and decision-making strategies. Learners are provided with opportunities to make informed choices regarding personal health and physical education, social and environmental responsibility, democracy and human rights and future careers (Figure 1)(24, 26).

We invited Grade 9 learners as the primary stakeholders and active participants of the study, to co-create a prototype of a problem-based learning approach, incorporating CS into the LO curriculum. Citizen science using the Our Voice method, along with advocacy training will enable adolescents to gather evidence, analyse and prioritise concerns regarding the food and physical activity environments in their school and surrounding communities, and offer solutions.

Fundamentals To be Prioritised	Life Orientation Grade 7-9: Proposed Topics/Concepts Per Priority
Development of Self in Society	• Concepts: personal diet and nutrition • Goal-setting skills: personal lifestyle choices • Challenging situations: depression, grief, loss, trauma crisis and anxiety
Health, Social and Environmental Responsibility	• Basic hygiene principles of COVID-19 • Substance abuse • Concept: environmental health • Common diseases: TB, diabetes, epilepsy, obesity, anorexia, HIV and AIDS including COVID-19 • Management of tuberculosis, diabetes, epilepsy, HIV and AIDS including COVID -19 • Health and safety issues related to violence
Constitutional Rights and Responsibilities	• Human rights as stipulated in the South African Constitution • Dealing with abuse
World of Work	• Time-management skills • Reading and writing for different purposes • Options available after completing Grade 9 • Knowledge of the world of work • Career and subject choices • Study and career funding providers
Physical Education	• Participation and movement performance in an outdoor recreational activity • Safety issues relating to participation in recreational activities

Figure 1: Western Cape Education Department Specific Learning Outcomes for Senior Phase Life Orientation

Our study aimed to include evaluation of the implementation fidelity to engage high school students in identifying, prioritising and advocating for inter-personal, and school or community-environmental factors that associate with the respective health behaviours. We documented the proximal outcomes of the study which include the youth-identified priorities and potential intervention targets based on the citizen science approach and the key stakeholders identified who

have the authority or mandate to help address barriers and support solutions.

Methods

Study Design

A cross-sectional study has been conducted in two high schools located in low-to-middle income communities in the City of Cape Town (CoCT). Participating high schools were selected in conjunction with the Western Cape Government Department of Education (WCED) to represent socio-economic and geographic diversity. An invitation and information letter were sent to each school principal. Once consent was obtained, we requested that each principal identify a staff member who is willing to be the main point of contact (Life Orientation teacher or teacher liaison officer). Through this contact, we arranged an introductory engagement at a time advised by the contact person to meet with the Grade 9 classes.

The study utilised a mixed methods approach incorporating CS “by the people” based on the *Our Voice* method (<https://med.stanford.edu/ourvoice/the-our-voice-model-page-2.html>) (17) and human-centred design (HCD). HCD is a creative problem-solving approach that focuses firstly, on the engagement with people, drawing on their “lived experiences” and context in which the problem to be solved exists(27). The HCD process used throughout is adaptive and included various iterations that encourage the inclusion of all stakeholder perspectives. For the purposes of this study, the perspectives of the CS are essential.

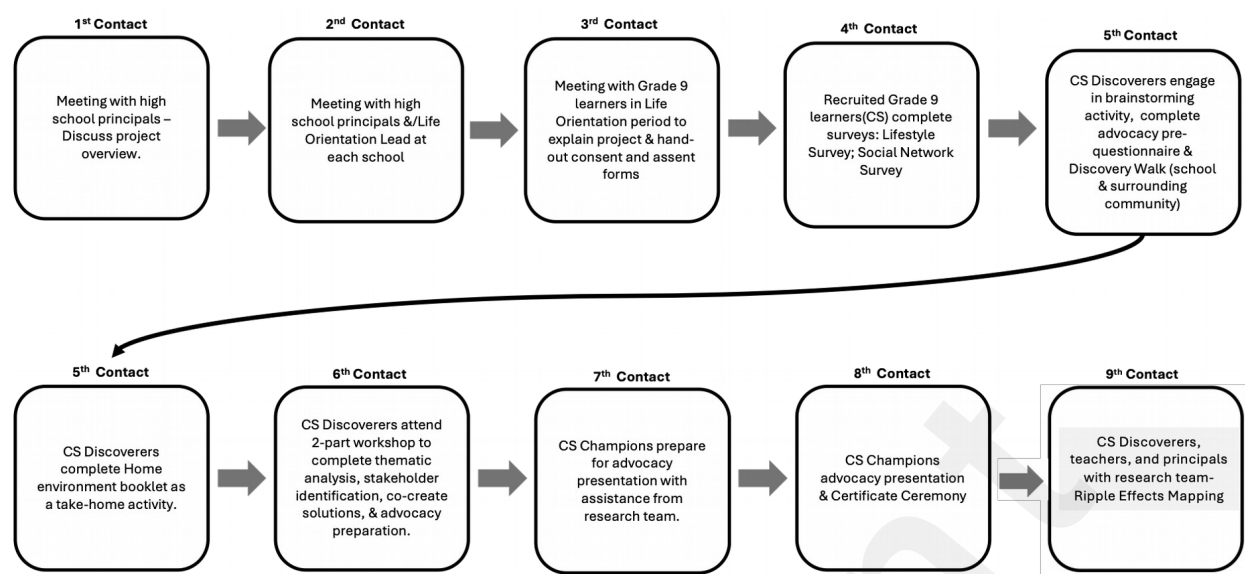


Figure 2: YEBO-SPAN Study Workflow

By selecting diverse settings, we anticipated that the practical methods and strategies that had emerged would reflect and be implementable within the “lived experiences” of these youth. Ultimately, adolescent participants were mentored in advocacy, to present their findings to stakeholders, including peers, family and community members, educators and/or policy makers.

Ethics Approval

This study has been approved by the University of Cape Town Human Research Ethics Committee (HREC 088/2019) and the Western Cape Government Department of Education. Prior to participation, students were asked to obtain written, informed consent from their parents or caregivers, as well as to provide their own written assent to participate in the study. There are no other exclusion criteria, once consent and assent have been obtained.

Participant Recruitment

Recruitment has been at three levels (Fig. 3). Firstly, six high schools were selected by the Western Cape Department of Education to join the study. An introductory meeting was held with school principals and Life Orientation educators in July 2024 (Fig. 2). During this meeting only 5 schools were represented of which three schools agreed to participate in the study in the third quarter of

the school calendar (August 2024). Following the introductory meeting, subsequent meetings were held with principals from these schools, however, only two schools were able to fully engage in the study.

A short presentation on healthy lifestyles and “citizen science” was conducted (less than 30 min) to the students, after which, the project was explained (provided in the Supplementary materials).

Secondly, Grade 9 learners (14-15 years old) from the two schools self-selected to be part of the study as a CS. Thirdly, CSs self-selected as a CS Explorer who’s contribution to the study outcome was to only complete the self-assessment of their own health behaviours and perceptions, as well as questions about their social support networks, or they self-identified as a CS Discoverer that in addition to completing the self-assessment also engaged in evidence generation concerning the food and physical activity environments in their schools and surrounding communities.

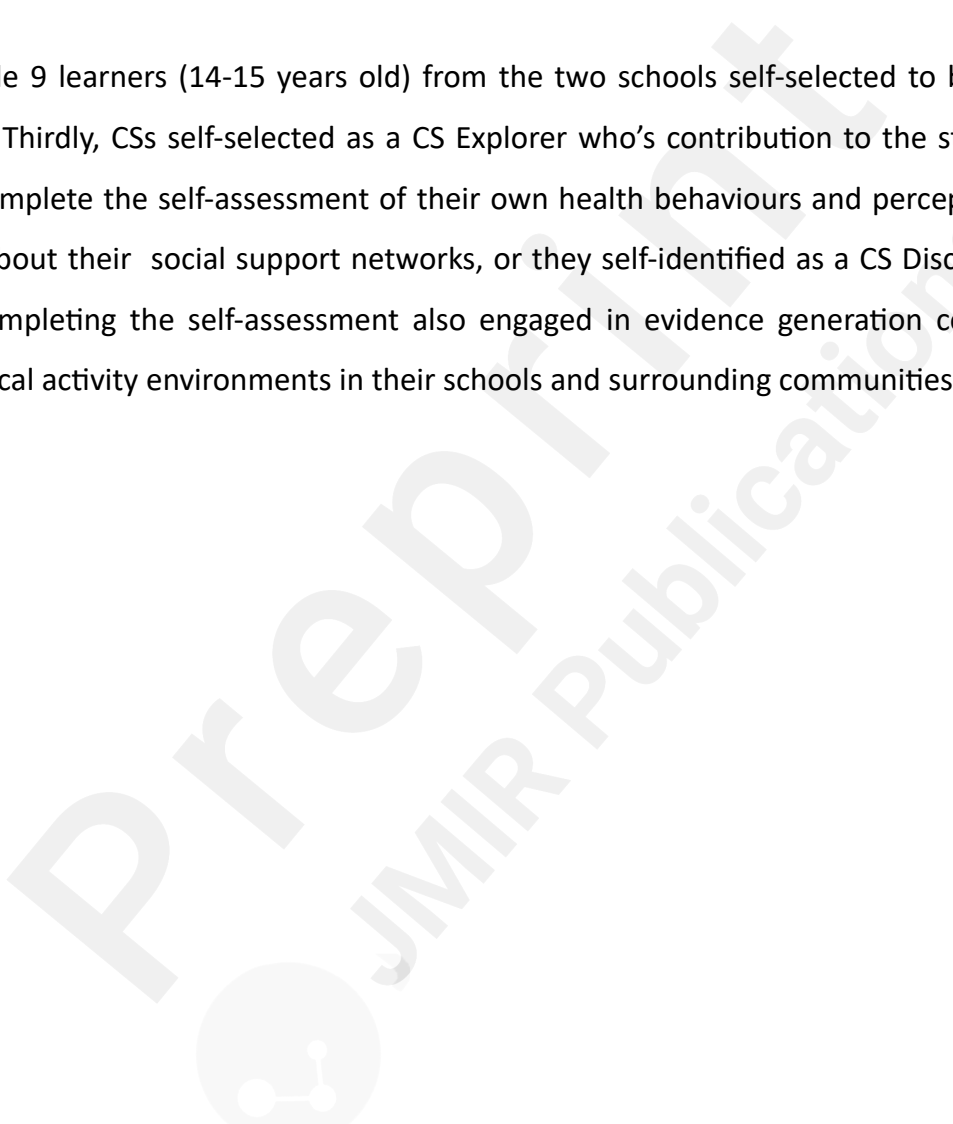


Figure 3: Participant Recruitment Schematic

Sample Size Estimation

To determine the appropriate sample size for the study to ensure a meaningful effect, OpenEpi was utilised (28). Based on the literature focusing on determining the role of CS interventions within the

school environment to shift or enhance the mindset of adolescents to improve the environment and their wellbeing (29, 30) there was a proportion of 0.7 of participants who were exposed with an outcome. Thus a total of 18 participants were needed to create a meaningful effect (see Annex). Therefore, it was estimated that the study needed to recruit 30-45 students per school (usually 3-4 classes per school per grade, thus approximately 100-200 students per school) to ensure that a significant effect is observed. We anticipated that between 30-50% of students would complete the self-assessment (CS Explorer) and that between 15-30 students would volunteer for the more time-consuming role of CS Discoverer.

Description of the Intervention

Overview of the Citizen Science Approach

We have previously successfully piloted this technique, targeting only physical activity and healthy eating, as part of the program of work of the Global Diet and Activity Research Network and the Stanford University *Our Voice* Global Research Initiative (16). The core 4 step approach is described in detail below.

Discover:

The Discover step involves the CS collecting photographic and audio-narrative data on their home, school and community environments, reflecting their “lived experiences” related to healthy choices (diet, PA), and their mental wellbeing. CS Discoverers will be asked to meet in small groups of 3-5 students, and discuss possible barriers and facilitators for healthy lifestyle choices, creating a list prior to collecting evidence (Discovery walk). They will be introduced to the mobile application, EpiCollect (<https://five.epicollect.net>, which shares some features with the *Our Voice* Neighborhood Discovery Tool and mobile application) (16, 20, 31), and trained to use the application to geotag, photograph, and describe factors in the school and surrounding community that they believe impacted their diet, PA, or mental wellbeing.

The application automatically geotagged photos alongside the audio-textual narrative feature (32).

CS were provided with mobile devices by the research team, and accompanied them on their Discovery walks in groups of 3-5 students, during school hours. Discovery walks included the school and surrounding community (0.5-1km buffer) environments. After completing the Discovery walks, all the data collected was uploaded to the secure, cloud-based storage system for EpiCollect. For data analysis purposes the audio-narratives were downloaded, de-identified, and transcribed by the research team. The de-identified audio-narratives were matched with the photographs from each school. Photos taken during the Discovery Walks that included individual faces were deleted from the cloud and mobile devices.

Discuss:

Following data collection and the collation of evidence for each school, CS were invited to a two-part workshop, during which CS from each school were split into working groups. In the first part, each group were provided with a random selection of de-identified photos and audio-narratives from their school. Groups engaged in a participatory process, in which they were asked to review the collated data (de-identified photographs and associated narratives of the various Discovery Walks) and to arrange it into themes (healthy eating choices, PA, and mental health). If other themes arise during this process, for example, bullying, safety or litter, these were included as well. The research team facilitated discussions within each group. These discussions included the review of their experience as CS and observations of their school and nearby-community environments within the context of these themes. Within groups, CS were asked to rank the barriers and facilitators according to their importance and the feasibility for change to mitigate or promote the issue. They presented their findings in a plenary session to the other CS.

Activate:

In the second part of the workshop, after the thematic data analysis, CS Discoverers were guided by the research team to compile data-driven solutions and/or action plans for school or community engagement and/or advocacy plans to address the top ranked items within the themes. Advocacy tools/plans were developed, adapted from the UNICEF Youth Advocacy Guide(19) and the Youth Engagement and Action for Health (YEAH!) Curriculum (23) (<https://yeah.gatech.edu>). We

incorporated some of the activities associated with human-centred design, including a root cause analysis and stakeholder charette to guide CS to build their advocacy strategy alongside the proposed solutions. CS discussed and shared their findings, prioritised factors identified as barriers or facilitators and the solutions in another plenary session with the other CS.

Change:

Following this workshop, CS Discoverers were trained to advocate for the changes collectively identified as solutions within their respective school or community environments, using their data-driven action plans (solution and advocacy strategy) as the foundation (16, 18, 19, 32). CS Discoverers had the opportunity to nominate spokespersons or Champions, who will present and advocate for intervention strategies or co-created solutions to invited stakeholders. These stakeholders may include their class cohort, educators, the principal and other identified persons or organisations that may be able to impact, influence or assist with the proposed strategies or solutions.

Measures

Demographic Variables

Adolescent demographic variables have been assessed using the lifestyle questionnaire at baseline. Adolescents were asked their birthdate to determine their age and the sex that they identify with to determine their gender.

Socioeconomic Variables

Several socioeconomic variables have been asked at baseline in the self-assessment lifestyle questionnaire that included the suburb that they resided in, household density (by age group and number of rooms), and household items.

Physical Activity

To ascertain the pattern of PA engagement, several PA-related questions have been asked in the

self-assessment lifestyle questionnaire at baseline pertaining to day-to-day PA- at home, at school, getting to and from places, for sport and just for fun with friends or family.

Behavioural Food Environment

To understand the behavioural food environment of adolescents; food choices, food purchases, and food practices experienced throughout their day-to-day life with family and friends, at home and at school have been asked at baseline in the self-reported lifestyle survey.

Social Network

To understand the nature of social support and social capital of participants, adolescents identified 33 alters" that ranged, for example, from mother, father, grandmother, coach, faith leader, teacher, to smart friend, popular friend, pretty friend, sporty friend. Additionally, to understand how the adolescents see themselves they were asked to pick personality traits that they identified with, including aggressive, curious, fast, fit, kind, popular, quiet, smart, etc.

Statistical Analysis

Descriptive Analysis

To assess the patterns and trends of healthy food choices, PA, and mental wellbeing the following analysis was proposed:

Parametric and non-parametric descriptive analyses have been performed to highlight demographic trends, perceived food and PA environments and various health indicators and health behaviours such as: dietary patterns, PA, sleep and mental well-being. Correlational and regression analyses will be used to examine relationships between health behaviours, environmental and ecological factors.

Social Network Analysis:

Using Python NetworkX library and Kumu, social network analyses was created (Márquez et al.,

2018, <https://digitalpromise.org/wp-content/uploads/2018/09/SNA-Toolkit.pdf>) to understand the nature of adolescents' social support and who or what may influence, strengthen or impede their PA, healthy eating behaviour, and mental well-being. Social networks will be characterised by size, density, centrality and betweenness of the various nodes.

Thematic Analysis

To identify patterns within the all qualitative data collection, themes were explored. Following the data collection from the Discovery Walks and Home Environment Assessment, a thematic analysis and sense-making was performed by CS Discoverers. Furthermore, Notebook LM (<https://notebooklm.google>) was used to identify emergent themes to strengthen the findings from CS. These themes were corroborated using manual coding with NVivo 15 (<https://lumivero.com/products/nvivo/>). Quantitative and qualitative data were triangulated to generate cohesive insights (33).

Qualitative Participatory Analysis

Once the themes were identified, CS Discoverers utilised sense-making tools to identify priority areas for intervention. Desirable and feasible solutions were co-created as a base for the proposed advocacy actions.

Data Collection Tools

This study incorporated several data collection tools namely, self-assessment lifestyle survey, social network survey, home environment assessment booklet, and advocacy survey (Fig. 4).

Figure 4: Data collection tools

Self-assessment lifestyle survey:

All CS Explorers and Discoverers completed a paper-based or online self-assessment survey (LimeSurvey) of healthy lifestyle behaviours related to diet, PA, factors acting as barriers or facilitators to these behaviours, along with measures of mental and physical well-being (see Annex).

The self-assessment survey is based on instruments used in previous studies involving South African adolescents (7, 31, 34-39). The following instruments have been incorporated or adapted for the self-assessment:

- Self-report PA data was collected using an adaptation of previously validated instruments, used in South African children and youth. The PA data captured intensity, frequency and duration of PA in various domains, including physical education, school sport, leisure time physical activity, organised sport outside of school, transport, occupational PA and household chores (31). The PA behaviour questionnaire was adapted from an instrument previously used successfully in South

African adolescents from low-income and rural settings, and validated against objectively measured physical activity (37).

- Sedentary behaviour was quantified using a context-specific sedentary behaviour questionnaire, which has been previously administered in adolescent populations (31, 37).
- Dietary patterns and practices was assessed using a short, semi-quantified food frequency questionnaire. The instrument captured “usual eating practices with regards to weekly meal pattern, breakfast consumption, foods taken to school, takeaways, and snacks eaten while watching television”, and specific foods in these categories, such as those high in added sugar, salt or unhealthy fats. This instrument has been used successfully in previous studies of South African adolescents(31). The dietary patterns questionnaire was adapted from the ISCOLE study, a multi-country study involving children from 12 countries from 6 continents. In this study, dietary patterns have been shown to be associated with certain health outcomes, such as adiposity (34, 38).
- Self-report data on sleep duration, quality, timing, risk for insomnia and daytime sleepiness was administered using tools validated for adolescents(7, 39).
- Quality of life was measured using the Child Health Utility instrument (CHU9D)(36).

Social networks survey:

An egocentric social network analysis is needed to understand the nature of social support and social capital of participants, and how these networks may influence health and well being (physical activity, diet and mental well being), both favourably or unfavourably. To do this, we have developed a bespoke survey instrument, asking participants to identify up to 3 “persons who they may consult for advice or support concerning lifestyle behaviours and their physical or mental well-being. These individuals are known as “alters”. Personal identifiers of these individuals will not be requested, but rather a general description is provided of their role in the adolescent’s life. Students will select from a list of “alters” or proxy actors, defined in categories such as: family members (mother, father, brother, sister, grandparent etc.), friends (sporty friend, clever friend, popular friend, healthy friend, etc.), and significant non-family members who are adults (teacher, youth leader, faith leader, doctor, etc) (see Supplementary material: YEBO-SPAN Social Network Survey).

Home Environment Assessment:

To determine facilitators and barriers to healthy food choices, PA, and mental wellbeing within the home environment, CS Discoverers were provided with a Home Environment booklet (see Annex) that provided learners with a space to visualise through drawings followed by adding a narrative.

Advocacy Survey:

A short, pre-post survey of students' perceptions on the effectiveness of advocacy has been adapted from the Youth Engagement and Action for Health! (YEAH!) project (18) (see Supplementary material: Advocacy Survey) and will be completed by the CS Discoverers prior to their "Our Voice" engagement and at the end of the project.

Ethical Considerations:

The current protocol was approved by the Human Research Ethics Committee in the Faculty of Health Sciences, University of Cape Town, South Africa (HREC 088/2019). Written, informed assent and consent were obtained by minor participants and their caregivers, respectively. The study protocol was also approved by the Western Cape Government Department of Education.

This research project may be considered a minimal risk protocol involving survey methodology, non-invasive measurements, qualitative observational research methods and a participatory, interactive approach. However, the complexities and ethical issues for conducting research and engaging adolescents as "citizen scientists" need to be carefully taken into consideration and controlled.

In accordance with the Declaration of Helsinki, special protection is needed for groups with diminished autonomy (40). Whilst adolescents, particularly in the context of urban informality represent a particularly vulnerable population group, the very limited existing research on the patterns of their "lived experiences" and equitable solutions for access to healthy food and opportunities for safe and enjoyable physical activity, makes research with this group important. The importance of this work is further highlighted as there is 1) evidence that these patterns may persist into adulthood, and 2) because we are inviting adolescent participants to not only gather data, but to receive training in advocacy for a change in circumstance, and to proffer solutions, as part of their participation in "citizen science" activities.

We lack local evidence for environmental and policy interventions that take into account the unique complexities associated with adolescence and youth health and wellbeing, particularly in a country such as South Africa, which has the highest level of inequality, globally. Furthermore, it can be argued that to promote access and equity, it is important to conduct research, identify barriers and potential solutions, and advocate, in partnership with those most likely affected.

Results

This study started in July 2024 and is a sub-study based formative work conducted under the Global Diet and Activity Research Network (41) study on health behaviours in adolescents, based in high school settings in Cape Town, South Africa (HREC 088/2019) in 2023. The results of the study will be disseminated amongst the research community and the schools involved in the study. Additionally, to increase the reach of this study, we will communicate the results with other stakeholders (e.g. Department of Education, community groups, parents, NGOs) through social media, institutional newsletters, and local media.

Discussion

This manuscript presents a protocol for a novel, mixed-methods study that leverages a participatory CS “by the people” (16, 17, 22, 25, 31, 32, 42) and HCD (27) approach to engage South African adolescents (14-15 years) in identifying and addressing barriers to healthy lifestyle behaviours within their school and community environments.

Expected Findings

By potentially embedding the intervention within the high school Life Orientation curriculum (26) and aligning with the Western Cape Department of Education priorities, the protocol creates a meaningful opportunity for systems-level impact and horizontal scaling (43). The outcomes of this study have the potential to improve physical and mental well-being and academic attainment, and thereby “future-proofing” South African youth for a healthier adult life trajectory and contributing to more health-promoting environments.

The YEBO-SPAN study builds on previous work by incorporating not only self-assessment and environmental audits (16, 31, 35), but also social network analysis (44), youth-led advocacy (18, 19, 23), and ripple effects mapping (25, 45, 46). This multifaceted approach is expected to yield actionable insights into how physical and social environments—and the actors within them—shape adolescent behaviours related to PA, healthy eating, and mental well-being.

A key strength of this protocol is its deliberate inclusion of adolescents as the agents of change, in the co-creation of interventions that may help mitigate environmental barriers and inequities that

impact on opportunities for safe and enjoyable PA and access to healthy, affordable food. These steps will provide a space for adolescents to be fully engaged in the process and become change agents. Furthermore, the novelty of this study lies in the intervention, which is age-specific and child-centred (target population is aged 14-15 years). This age group of adolescents are more independent both in their personal lives but also at school where they can now select school subjects which will influence their way of thinking and exploring the world beyond Grade 9 (47). The four-step Our Voice citizen science process empowers youth to generate and interpret evidence from their own lived experiences (16, 17, 22, 25, 31), while the HCD (27, 48) approach provides a systems lens focused on addressing the underlying needs of youth by providing the processes and tools to the creation of interventions that aim to address the challenges identified. The HCD process in this study involves (1) *understanding* the problem through a literature review ("Background" section) and by learning about the lifestyle and social network of adolescents through surveys, (2) *empathising* with participants through engagement and further exploration of their lived experiences through reflection and discussion to discover underlying needs, (3) *re-defining* the identified problem through collaboration with adolescents and utilising collected evidence, (4) *ideating* to develop potential solutions needed to address underlying needs by means of participatory workshops, (5) *prototyping* implementation strategies through action plans for both school and (surrounding) community environments, (6) *testing* and refining advocacy strategies through real-world engagement with stakeholders, and (7) *iterate* by utilising the evidence collected to validate if the solutions proposed will address the underlying needs of adolescents within school and (surrounding) community environments. This combined framework supports not only youth-led data generation and prioritisation but also collaborative development of actionable, contextually grounded, and sustainable solutions. Integrating advocacy training into the curriculum provides an innovative pathway needed to sustain engagement across multiple stakeholders and potential policy impact(18). The combined approach of CS and HCD is novel to the South African context, particularly within schools.

Limitations and Strengths

This protocols innovative lens is showcased even further through the implementation of an egocentric social network analysis (SNA) as a complementary tool for gaining a deeper

understanding of the interpersonal influences on adolescent health behaviours. Through the SNA, this study is able to capture the size, composition, and structure of adolescents' support networks. It also has the capability to identify central actors—such as peers, teachers, adult youth leaders or family members—who may function as enablers or barriers to PA, healthy eating, and mental well-being. This information will inform co-created intervention strategies by helping to identify whom to engage with as champions or allies when advocating to address underlying needs, and by highlighting opportunities for leveraging positive peer or adult influence (49). Network metrics such as density and betweenness centrality will be used to assess potential for diffusion of health and wellness-promoting messages within adolescent ecosystems.

Nonetheless, several challenges are anticipated. These include:

1. Recruitment and retention may be impacted by school-level buy-in, academic demands, and competing extracurricular commitments.
2. Although mobile technology use is widespread amongst youth, variations in digital literacy or access may affect the quality and completeness of CS data collection.
3. Early implementation has also revealed variability in school participation, which may limit short-term generalizability.

From an ethical standpoint, the protocol foregrounds equity by centering the voices of adolescents—particularly those in low-resource urban settings—whose needs are often overlooked in public health planning. The approach aligns with international calls for youth participation in health decision-making and recognizes the long-term impact of adolescent health behaviours on adult outcomes(50, 51).

Publishing this protocol allows for transparency in study design, offers a replicable framework for youth-engaged research in similar LMIC settings, and contributes to the growing literature on citizen science and co-creation methods in health promotion. The inclusion of ripple effects mapping is particularly valuable in capturing both intended and unintended outcomes of the intervention, including shifts in youth agency, educator engagement, and school-level responsiveness.

This study design and method integrates the building blocks of APEASE (52), YoPA framework (53),

and Lundy model (54). These study designs ensure that adolescents are central to the design, implementation, and sustainability of the proposed interventions. Similarities to APEASE includes ensuring that the study outcomes fall within a budget (Affordability), multiple stakeholders like learners, educators, and the Department of Education have accepted the intervention, and the study was targeted towards a specific population (adolescents) (Targeting). This study and YoPA focuses on upskilling youth with research tools and methodologies to ensure that the intervention is driven by youth. Furthermore, by ensuring that the adolescents in this study have agency through advocacy training, like the Lundy model, a safe space will be created to ensure that adolescents could share their thoughts and experiences (space) (54). Additionally, adolescents voice will be strengthened by providing training to ensure that their perspectives are articulated with confidence. This will be achieved through one-on-one training with research teams (voice) (54). Furthermore, to ensure that all relevant stakeholders are present during the presentation of findings by adolescents, it is essential that all relevant decision-makers are be present (audience) (54). To ensure that the influence of the adolescents are showcased especially for the iteration of the intervention, the research team will inform the adolescents about their contributions through inclusion of a stakeholder engagement workshop that will focus on incorporating the intervention into the classroom setting and present the dissemination of their findings.

Future Direction

Future work will include the following from the APEASE framework; utilising existing infrastructure in future iterations of the study like the classroom (Practicability), to determine the effectiveness and cost-effectiveness of the intervention, and to strengthen partnerships with existing and new entities (Signposting).

Additionally, in order to evaluate and disseminate the impact of the study with various stakeholders including schools and surrounding communities, and other decision makers; ripple effects mapping (REM) will be conducted. REM is a “qualitative participatory method requiring the active input of stakeholders in data gathering resulting in visual outputs (i.e., maps) of the program activities and impacts” (45, 46). REM involves aspects of appreciative inquiry, mind mapping, facilitated discussion, and qualitative data analysis.

REM will help to identify the wider impact of the project, along with any transformation in the school, community or home environments that may have occurred. However, even more importantly, the REM process will help to uncover any beneficial and often unintended consequences of the process. For example, through training in advocacy, youth may develop greater agency and apply these skills in a broader personal context, or the school authorities may become more receptive to student initiative and engagement.

An adapted form of REM in a 4-stage process is performed [41]:

- **Appreciative inquiry:** The research team developed 2-3 short guiding questions to assess the impact of the research. These questions will revolve around reflection on the positive aspects of the research project such as highlights or achievements because of the research, new and or unexpected ideas/changes that have emerged from the research. The citizen scientists will be paired up to interview each other and they will make notes of the responses.
- **Group mapping session:** after the appreciative inquiry, as a group with the facilitator and mapper (trained members of the research team), the CS will report on, and further discuss the interview to map the ripple effects of the project or program using flipchart/whiteboard or similar.
- **Additional information:** We will collect additional information by interviewing the liaison officers and the principals of the schools with 2-3 short guiding questions to assess the impact of the research and for reflection on the next steps.
- **Clarify, code, and analyze data:** After the session and interviews, the research team will collate the data for analyses and mapping. After the information has been collated, it will be presented back to the citizen scientists and other stakeholders, to ensure that the information has been adequately captured. On reflection, there may be additional impacts or actions that may be added, or actions arising from the mapping exercise.

This protocol is one of the few examples that combines the HCD approach and CS to improve the

livelihoods of adolescents (55) but is the first in Africa.

Funding:

This study was funded by a University of Cape Town Stimulus Grant, and Dr. Albertyn-Blanchard's funding was made possible by the University of Cape Town Research Committee. Dr. Feyisayo Wayas is supported by a NIHR-funded post under the Global Diet and Activity Research Network (GDAR) - Spaces grant.

Conflicts of Interest:

All authors have no competing interests to declare.

Data Availability:

As this is a protocol manuscript, there are no data, as of yet, to share.

Authors' contributions:

EVL initially conceptualised the study and wrote the grant to secure funding. OA, ZA, SW, FW, DR, JH, and IT contributed to various modifications to the study protocol. AK provided the method and training for the Our Voice Citizen Science component.

Consent for publication:

No individuals or school names have been identified in this manuscript.

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5. ANNEXURES:

- Annexure A Information letter and assent form for adolescents recruited through school
- Annexure B Information letter and consent form for parent, guardian or caregiver of adolescent recruited through school
- Annexure C Lifestyle survey
- Annexure D Discovery Walks
- Annexure E Home-environment booklet
- Annexure F Social network survey
- Annexure G Pre Survey for Advocacy Training and Implementation

ANNEXURES

ANNEXURE A

Youth Engagement for Better Outcomes: Sleep & Social networks, Physical Activity and Nutrition (YEBO-SPAN) – “Future proofing” South African Adolescents

YOUTH/LEARNER INFORMATION LEAFLET AND ASSENT FORM

Dear learner

The YEBO-SPAN project is a research project that works together with young people on topics related to healthy sleep, physical activity and healthy eating. We are trying to better understand factors that influence or impact on healthy lifestyle choices, and to assist young people in identifying barriers to making these choices and to advocate for change. We are interested in finding equitable solutions and helpful partnerships, with engaged stakeholders, to assist with these solutions and strategies.

You are receiving this information leaflet because your school has been selected by the Western Cape Education Department to take part in the study, with the consent of your school headmaster. A staff member has been nominated to act as a contact liaison between the school and the research team. This leaflet explains more about the study and if you choose to participate, what might be expected of you. Please take some time to read what is presented below. Feel free to ask any questions, about any part of this study that you do not understand.

Study context

This study forms part of a larger study by the Global Diet and Physical Activity (GDAR) Network (including groups in Cameroon, Nigeria, Jamaica and Brazil) that aims to contribute to the prevention of non-communicable (non-infectious) chronic diseases in low and middle income countries. The study focuses on health behaviours in adolescents, and works together with young people to better understand the factors that influence healthy eating, physical activity and getting good quality sleep.

Study aim

The main aim of this study is to identify factors that may impact on health behaviours in adolescents within the school and neighbourhood settings. The research team will work with Grade 9 learners from six schools and/or youth centres across Cape Town, to collect information on:

- Sufficient, good quality sleep;
- Opportunities for and participation in safe and enjoyable physical activity;
- Access to and consumption of affordable healthy food;
- Maintaining a healthy weight

What does the study involve and what will you be asked to do if you volunteer to participate in this study?

You will be invited to be part of the following:

- A. Citizen Scientist Explorer: Completes (a) and (b) below

OR

B. Citizen Scientist Discoverer: Completes (a), (b) and (c)*a. Complete a survey exploring lifestyle choices*

You will be asked to complete an online survey about your sleep patterns, diet and physical activity behaviours, mental and physical well-being. You will be asked to measure your height and weight. All Grade 9 learners in the school will be invited to take part in this phase of the study. This will take place during a time decided by the school and will not interfere with your learning time. Online access and tablets to complete the survey will be provided by the research team. All of your information will be kept completely confidential.

b. Complete a social network survey

To better understand how social networks may influence healthy eating, physical activity and sleeping patterns, you will be asked to list friends/peers, family members or other persons with whom you have discussed these issues or who influences your thinking related to sleep, being physically active and diet. These persons will not be identified by name, but rather by their relationship to you (friend, teacher, parent, grandparent, coach etc.). All Grade 9 learners who took part in the health behaviour survey will be invited to complete the social network survey. The survey will be done online during school hours, and you will be provided with a device to complete this. This will also take place during a time decided by the school and will not interfere with your learning time. Online access and tablets to complete the survey will be provided by the research team.

c. Discovery Walk and Advocacy Training

You will also be invited to volunteer to become a citizen scientist discoverer. Up to 15 learners in the school will be part of this phase. Citizen scientists will be trained in a 60-90 minute workshop to assess the school and home neighbourhood environment (within 1km of your school or home). You will work in pairs to look at things in the environment that affect or interfere with healthy eating and being active (e.g. exercise, recreation, sport). You will also be asked to assess your home environment about factors that influence your sleep patterns. You will be provided with the loan of a cell phone with a mobile app, and asked to take photos and provide an audio explanation of why you chose the photos to represent these factors or barriers. These are called Discovery walks.

Afterwards, you will be invited to attend two half-day (4-5 hours) workshops where you will join with other citizen scientists. You will be presented with all of the photos and narrations (de-identified), and asked to work together to prioritise them according to themes of 1) important to change and 2) possible to change (feasible). Once this step is completed, the research team will help you prepare a presentation, to share your findings with stakeholders who you have identified that may help you in making the changes.

What if I don't want to take part, or if I change my mind about taking part during the study?

You can choose take part in the study or not. If you decide to take part and change your mind at any stage and decide to leave the study, you can do so without an explanation or negative outcome. The data already collected about you will be kept for the study, with your permission.

Will you benefit from this research?

We believe young people themselves should take part in co-designing policies and interventions that affect them. You may benefit from the study by knowledge exchange and capacity building, but there is no guarantee that you will benefit directly from participation in this study. You will receive a certificate documenting your involvement and contribution from the research team.

By involving young people in this study, we hope to learn more about real-world solutions and strategies that may help to lower their barriers to healthy eating, physical activity and adequate sleep. We hope to learn more about the role of social networks and how these can help to support healthy lifestyle choices of young persons. We also anticipate that the study will offer important information which may one day help policy makers and other groups to make healthier and safer communities.

Does this study pose any risks to you?

Participation in this study is entirely voluntary, and all learner data gathered will remain confidential. As such, the baseline self-report survey offers no risk to participants. If you choose to participate as a citizen scientists, there is no more risk than you would experience walking in school or in your surrounding neighbourhood, as pairs or accompanied by an adult member of the research team. You will be documenting these walks with photos and audio narratives, with cell phones provided by the research team. All efforts will be taken to ensure that volunteers feel safe, that no individuals are identified in the photos (no faces shown) and that transcribed narratives will remove any identifying information regarding specific persons or places.

Who is paying for this study?

There is no cost to you, as a participant. The study is funded by the a small seed grant from the Faculty of Health Sciences, University of Cape Town.

Ethical considerations*Voluntary participation*

Participation in this research project is completely voluntary. You may change your mind at any stage and decide to leave the study. You can do so without consequence or explanation. The data already provided will be kept for the study, with your permission.

Consent and assent

You will be provided with an information letter and consent form for your parent / guardian / caregiver to sign before joining the study. You can only join the study if you have provided parental / guardian / caregiver consent by the due date indicated.

Anonymity

The self-assessment (health behaviour survey) and social network survey will be anonymous. This means that you will not need to give your name or any personal identifying information or characteristics. In the social network, when requesting up to 10 friends/peers, family members or other persons, names will not be asked but the relationship between you and the person. If you choose to volunteer as a citizen scientist, your identity will be known to other volunteers, and to stakeholders to whom advocacy may be directed. However, all data collected (photos and narratives) will be de-identified for group work.

Confidentiality

The information collected in this study will be kept confidential. Your information / data will be given a number (all surveys will be coded). Hard copy information will be kept in a locked cabinet and electronic information will be password protected. Information will be accessible only to the researchers in the study. However, we cannot keep your identity confidential if you become a citizen scientist, as you will be taking part in a group activity with your peers.

How will we use the information you provide?

The information collected and the discussions and inputs that is provided during the workshops will be analysed so that the research team can fully understand the viewpoints and experiences of citizen scientists. The research team will access data and outputs from the workshops. This information may also be shared with other researchers. Results of the survey and workshops will be used for the purposes of advocacy training, and dissemination as research outputs, reports and/or policy briefs or infographics.

If you have any questions about your participation in the study, feel free to contact:

Emeritus Professor Vicki Lambert

UCT Research Centre for Health through Physical Activity, Lifestyle and Sport (HPALS)
Head of Division of Exercise Science and Sports Medicine (ESSM)
Department of Human Biology, Faculty of Health Sciences
University of Cape Town
Tel: 082 312 6890
Email: vicki.lambert@uct.ac.za

Prof Marc Blockman, Chair,
University of Cape Town Human Research Ethics Committee
Faculty of Health Sciences, Room E52-24 Groote Schuur Hospital Old Main Building, Observatory
7925; Phone: 021-406-6338

LEARNER PARTICIPANT INFORMATION LEAFLET AND ASSENT FORM*Please select your participation preference below:*

A. Citizen Scientist Explorer

please tick preference ☐

OR

B. Citizen Scientist Discoverer

please tick preference ☐

I, _____, have fully explained to _____ the nature and purpose of the above described research project, and the risks that are involved as a participant in this study. I have answered and will answer all questions to the best of my ability.

(Research staff signature)_____
Date

Professor Estelle Lambert, who is one of the principal investigators for this study, or her associates will be available to answer any questions you may have. Professor Lambert can be reached at: 082-3126890. If you ever feel that you have been injured by participating in this project or if you have any questions concerning your rights as a research participant, you may contact the University of Cape Town Human Research Ethics Committee of the Faculty of Health Sciences : [021] 406 6626. You will receive a signed copy of this informed assent document.

I declare that:

- I have read and understood this information and assent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions to the researcher (if this is a different person), and all my questions have been adequately answered.
- I understand that my participation in this study is voluntary, and I have not been pressurised in any way.
- I understand that what I write or say could be reproduced publicly and/or quoted, but without reference to my personal identity.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.
- I understand that the information collected about can be stored by the University of Cape Town and will be used to support other research in the future and will be shared anonymously with other UCT and GDAR researchers including researchers in other countries.

Please also indicate whether or not you are willing to be contacted for future participation in research related to this study.

____ Yes, I am also willing to be contacted for future research related to my participation in the present project

____ No, I would prefer not to be contacted for future research beyond my participation in this study.

By signing below, I _____ agree to take part in the research project.

____ Grade _____ Gender ☐ Male ☐ Female

Signature

ANNEXURE B

**Youth Engagement for Better Outcomes: Sleep & Social networks, Physical Activity and Nutrition
(YEBO-SPAN) – “Future proofing” South African Adolescents**

PARENT / GUARDIAN / CARER INFORMATION LEAFLET AND CONSENT FORM

Dear Parent / Guardian / Caregiver

The YEBO-SPAN project is a research project that works together with youth on the topics of sleep, social networks, physical activity and nutrition to address these health behaviours linked to overweight and obesity, symptoms of anxiety and depression and academic performance. The project uses an original approach to address these health risk behaviours by involving youth in developing equitable, culturally, socially, economically and age-relevant interventions.

You are receiving this information leaflet as your child's school has been selected by the Western Cape Education Department to participate in the study and the school headmaster has consented to take part in the study. A school teacher has been nominated to act as a contact liaison between the school and the research team. This leaflet explains more about the study and what might be expected of your child, should they wish to volunteer and should you give your consent. Please take some time to read what is presented below. Feel free to ask any questions, about any part of this study that you do not understand.

Study context

This study forms part of a larger study by the Global Diet and Physical Activity (GDAR) Network aiming to contribute to the prevention of non-communicable (non-infectious) chronic diseases in low and middle income countries (along with groups in Cameroon, Nigeria, Jamaica and Brazil). The study focuses particularly on health behaviours in adolescents, and works together with youth to better understand the factors that influence healthy eating, physical activity and getting good quality sleep.

Study aim

The main aim of this study is to identify factors that may impact on health behaviours in adolescents within the school and neighbourhood settings. The research team will work with Grade 9 learners from six schools and/or youth centres across Cape Town, to collect information on:

- Sufficient, good quality sleep;
- Opportunities for and participation in safe and enjoyable physical activity;
- Access to and consumption of affordable healthy food;
- Maintaining a healthy weight

In this study we plan to engage and train adolescents to engage and advocate with key stakeholders who have the authority to address barriers and support solutions.

What does the study involve?

This study has four phases:

1. Collect baseline information by inviting the 14-15 year old members of your school or youth organisation to complete a self-assessment related to their sleep patterns, diet and physical activity behaviours, mental and physical well-being and their academic performance, once consent and assent have been secured. This phase will consist of a digital survey and self-measurement of height and weight. 1. A wireless network and devices will be provided by members of the research team at the school or youth organisation to allow participants to complete the survey without incurring any airtime or online data costs.
2. Construct a youth social network to understand the nature of social support and social capital and how this network may influence these health risk behaviours. All participants who participated in the self-assessment will be invited to list friends/peers, family members or other persons with whom they have discussed issues of importance related to these health behaviours. These persons will not be identified by name, but rather by their relationship to the learner (friend, teacher, parent, grandparent, coach etc.). Members will be requested to complete this as an online survey. A wireless LAN and devices will be provided with members of the research team at the youth organisation to allow participants to complete the survey without incurring any airtime or online data costs.
3. Engage with and train a sub-sample of participants (between 10 and 15 volunteers) to become "citizen scientists" where they will conduct observational, photographic and narrative assessments of their schools, home and neighbourhood (within 800 m of their residence) environment. In these environments, citizen scientists will work in pairs to identify barriers and facilitators related to healthy eating and physical activity, and adequate sleep of good quality. Thereafter, they will be invited to three workshops where they will learn how to analyse and present the information, and advocate changes to the relevant environment to identified stakeholders.

What is expected of my child as a participant in this study?

Your child will be invited to be part of the following:

- A. Citizen Scientist Explorer: Completes (a) and (b) below
- OR
- B. Citizen Scientist Discoverer: Completes (a), (b) and (c)

a. Complete a survey exploring lifestyle choices

Your child will be asked to complete a survey on their sleep patterns, diet and physical activity behaviours, mental and physical well-being and their academic performance. They will be asked to measure their height and weight. All Grade 9 learners in the school has been invited to participate in this phase of the study. This will take place during a time decided by the school and will not interfere with their learning time.

b. Complete a social network survey

To better understand how social networks may influence these health risk behaviours, your child will be asked to list friends/peers, family members or other persons with whom they have discussed issues related to these health behaviours. All Grade 9 learners who participated in the health behaviour survey will be invited to complete the social network survey. The survey will be done online during school hours, and learners will be provided with a device to complete this survey. This will also take place during a time set decided by the school and will not interfere with their learning time.

c. Discovery Walk and Advocacy Training

Grade 9 learners will be invited to volunteer to become a citizen scientist discoverer. Up to 15 learners will be part of this phase. These citizen scientists will be trained (workshop 1) to assess the school and home neighbourhood environment (within 800 m of their residence). Learners will work in pairs to identify barriers and enablers related to healthy eating and physical activity. They will assess their home environment related to factors that influence their sleep. Afterwards, these learners will be invited to two workshops where they will learn how to analyse and present the information, and advocate changes to the environment that would make it better. They will present to stakeholders, whom they would have identified as those who can impact on change.

What if I don't want my child to take part, or if I change my mind about my child taking part during the study?

Your child's participation in the study is completely voluntary. There will be no consequences if he/she decides to withdraw. If you change your mind part way through and decide to withdraw your child from the study, you can do so without consequence or explanation. The data already provided will be kept for the study.

Will your child benefit from this research?

Your child's participation in the study should be beneficial through knowledge exchange and capacity building, but there is no guarantee that your child will benefit directly from this study. Your child's participation may help the research team to learn more about the impact of the project for opportunities to improve health and wellbeing for all. We will also learn important information which might one day help policy makers and other groups to make healthy and safe communities.

Does this study pose any risks to my child?

Participation in this study is entirely voluntary, and all individual participant data gathered will remain confidential. As such, the baseline self-report survey offers no risk to the youth participants. Those who choose to participate as citizen scientists have no more risk than they would experience walking in their school and surrounding neighbourhood, as pairs or accompanied by an adult member of the research team. They will be documenting these walks with cell phone photos and audio narratives, with cell phones provided by the research team. All efforts will be taken to ensure that volunteers feel safe, that no individuals are identified in the photos (no faces shown) and that

transcribed narratives will remove any identifying information regarding specific persons or places.

Who is paying for this study?

There is no cost to you. The study is funded by the Faculty of Health Sciences, University of Cape Town.

Ethical considerations

Voluntary participation

Participation in this research project is completely voluntary. Participants may change their mind at any stage and decide to withdraw from the study. They can do so without consequence or explanation. The data already provided will be kept for the study.

Consent and assent

Each learner will be provided with an information letter and consent forms for their parent / guardian / caregiver to sign prior to participation in the study. Only those who have provided parental / guardian consent by the due date indicated will be allowed to participate in the study.

Anonymity

The self-assessment and social network components of the study will be anonymous. This means that learners will not be required to provide their name or any personal identifying information or characteristics. In the social network, when requesting friends/peers, family members or other persons, names will not be requested but the relationship between the learner and the person.

Confidentiality

The information collected in this study will be kept confidential. Learner's data will be given a number (all surveys will be coded). Hard copy information will be held in a locked cabinet and electronic information will be password protected. Information will be accessible only to the researchers in the study. However, we cannot keep participant's identity confidential, as learners will be taking part in a group activity with their peers.

How will we use the information you provide?

The information collected from the surveys and the discussions and inputs that is provided during the workshops will be analysed so that the research team can fully understand the viewpoints and experiences of adolescents. This information may also be shared with other researchers.

If you have any questions about your child's participation in the study, feel free to contact:

Emeritus Professor Vicki Lambert

UCT Research Centre for Health through Physical Activity, Lifestyle and Sport (HPALS)
Head of Division of Exercise Science and Sports Medicine (ESSM)
Department of Human Biology, Faculty of Health Sciences
University of Cape Town
Tel: 082 312 6890
Email: vicki.lambert@uct.ac.za

Prof Marc Blockman, Chair,
University of Cape Town Human Research Ethics Committee

Faculty of Health Sciences, Room E52-24 Groote Schuur Hospital Old Main Building, Observatory 7925; Phone: 021-406-6338

PARENT/ GUARDIAN / CAREGIVER INFORMATION LEAFLET AND CONSENT FORM

I, _____, have fully explained to _____ the nature and purpose of the above described research project, and the risks that are involved as a participant in this study. I have answered and will answer all questions to the best of my ability.

(Research staff signature)

Date

Professor Estelle Lambert, who is one of the principal investigators for this study, or her associates will be available to answer any questions you may have. Professor Lambert can be reached at: 082-3126890. If you ever feel that you have been injured by participating in this project or if you have any questions concerning your rights as a research participant, you may contact the University of Cape Town Human Research Ethics Committee of the Faculty of Health Sciences : [021] 406 6626. You will receive a signed copy of this informed assent document.

I declare that:

- I have read and understood this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions to both the person obtaining consent, as well as the researcher (if this is a different person), and all my questions have been adequately answered.
- I understand that my child's participation in this study is voluntary, and I have not been pressurised in any way.
- I understand that what my child writes or say could be reproduced publicly and/or quoted, but without reference to my or my child's personal identity.
- My child may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- My child may be asked to leave the study before it has finished, if the researcher feels it is in my child's best interests, or my child does not follow the study plan, as agreed to.
- I understand that the information collected about my child can be stored by the University of Cape Town and will be used to support other research in the future and will be shared anonymously with other UCT and GDAR researchers including researchers in other countries.

Please also indicate whether or not you are willing to be contacted for your child's future participation in research related to results of this study.

___ Yes, I am also willing to be contacted for future research related to my child's participation in the present project.

___ No, I would prefer not to be contacted for future research beyond my child's participation in this study.

By signing below, I _____ agree for my child to take part in the research project.

Name of the Child

Grade _____ Gender ☐ Male ☐ Female

Date: _____

(Signature: Parent/Caregiver)

ANNEXURE C – Lifestyle Survey**YEBO-SPAN: Youth Engaged- Better Outcomes (Sleep, Social networks, Physical Activity & Nutrition)****There are 39 questions in this survey.****Descriptive****Please add your name *****Please write your answer here:****Please select your school *****Please choose only one of the following:****Add your birthday****Please enter a date:****How old were you at your last birthday?****Please write your answer here:**

•

Which of the following do you feel best represents your gender?**Please choose only one of the following:**

- Female
- Male
- Non-binary
- Prefer not to say

What is the name of the neighbourhood or suburb in which you live?**Please write your answer here:****How many adults live in your home? *****Please write your answer here:**

•

How many teens (13-17 years old) live in your home? ***Please write your answer here:**

•

Including you.**How many children (0-12 years) live in your home? *****Please write your answer here:**

•

How many rooms are in your home (excluding bathrooms)? ***Please write your answer here:**

•

Which items do you have access to (tick all that apply)?**Please choose all that apply:**

- Mobile phone

- Computer, laptop or electronic tablet or pad
- Television
- Private motor car
- Bicycle
- Fitness centre or gym

All about food!

The next few questions are about food, including food choices, food purchases, and food practices in your day-to-day life with family and friends, at home and at school.

Choose the statement which best describes your food habits for each item below.

Please choose the appropriate response for each item:

Never Rarely or Sometimes Often or Always
 rarely occasionally frequently

I try to eat at least 3-5 servings of vegetables daily.

I try to eat at least 3-5 servings of fruits daily.

I eat at least one small serving of lean meat, chicken, fish, eggs, nuts or legumes daily (such as lentils, and beans).

I avoid eating processed meats like processed salami, meats like bologna, salami, other cold cuts, hot dogs, sausage or bacon.

The breads, cereals, pastas and rice that I eat are mostly wholegrain.

I drink sugary, fizzy and energy drinks and add sugar to my tea and coffee.

I eat highly processed foods and snacks, like crisps, crackers, cheese snacks, "two minute noodles".

I limit my intake of cakes, biscuits, chocolate, chocolate, and sweets to not more than 1-2 times per week.

I try and eat fish at least one time per week.

I eat takeaways and fast food, like hamburgers, Gatsby's, Kotas, french fries, and pizza.

I generally prepare home-cooked meals, using fresh products and whole foods.

I am involved in the shopping and preparing of

Never Rarely or Sometimes Often or Always
 rarely occasionally frequently

food in my home.

I pack and take my lunch to school.

I have pocket money and purchase from the school tuck shop or vendors.

I tend to snack late at night, before going to sleep.

Do you receive pocket money from your parents or family members?

Please choose only one of the following:

- Yes
- No

If you receive pocket money, how much do you receive each week (in Rands)?

Please write your answer here:

•

Do you engage in paid work each week?

Please choose only one of the following:

- Yes
- No

If so, how much money do you receive each week from your work (in Rands)?

Please write your answer here:

•

For each of the statements below, identify how the factors below influence your food choice decisions.

Please choose the appropriate response for each item:

1-Strongly
Disagree

2

3

4

5-
Strongly
Agree

My food choices are based mostly on foods that I prefer.

My food choices are based mostly what I can afford.

My food choices are based mostly on what my parents buy and prepare for me.

My food choices are based mostly on what my friends are eating.

My food choices are based mostly on what I think is healthy.

All about physical activity!

The next few questions are about your day-to-day physical activity- at home, at school,

getting to and from places, for sport and just for fun with friends or family.

How many days are you physically active at school during a typical week? This includes moderate (like brisk walking) and vigorous activity (like running or sports).

Please choose the appropriate response for each item:

	None	Less than once per week	Once per week	Two times per week	Three times per week	Four times per week	Everyday
--	------	-------------------------	---------------	--------------------	----------------------	---------------------	----------

Physical Education

Class

Break Time

School sports

In a usual week, how much time on average do you spend each day walking or cycling getting to and from places (for example, going to school, to a bus stop, shopping or to visit a friend)?

Please choose only one of the following:

- Less than 10 min/day
- 10-29 min/day
- 30-59 min/day
- 60-89 min/day
- 90-120 min/day
- More than 120 min/day

In a usual week, how much time on average do you spend each day being physically active outside of school? This includes only moderate and vigorous activity (as in brisk walking or running or sports play).

Please choose the appropriate response for each item:

	None	0-29 min/day	30-59 min/day	60-89 min/day	90-120 min/day	More than 120 min/day
--	------	--------------	---------------	---------------	----------------	-----------------------

After school sports teams

Leisure activities (like skateboarding, running, ball games or dancing)

Fitness activities (like gym, aerobics classes, Zumba etc.)

Please respond to the following statements on a scale of 1-5, from strongly disagree (=1) to strongly agree (=5).

Please choose the appropriate response for each item:

1-Strongly
Disagree

2

3

4

5-
Strongly
Agree

Regular physical activity is important
for my health and mental well-being
(on a scale of 1-5).

I am participating in sufficient physical
activity for my health and mental well-
being (on a scale of 1-5).

Which of the following factors do you consider barriers to participating in physical
activity? *

Please choose the appropriate response for each item:

Lack of time to be physically active	Lack of support from friends and family	Lack of resources or funds	Lack of facilities in community	Lack of knowledge on how to be physically active	Lack of confidence in my ability to be physically active	Lack of concern for my safety to be physically active	It is not a priority in my life	I don't enjoy it	Other
--------------------------------------	---	----------------------------	---------------------------------	--	--	---	---------------------------------	------------------	-------

Physical activity during physical education
School sports
Physical activity during break
Physical activity getting to and from places
Physical activity for fun and leisure
Physical

Lack of support resources or friend and family
 Lack of facilities in community
 Lack of knowledge on how to be physically active
 Lack of confidence in my ability to be physically active
 Lack of concern for my safety to be physically active
 It is not a priority in my life
 I don't enjoy it
 Other

competition
 in activity
 for
 competition
 outside
 of school

What one thing would you change if you could, that would make physical activity more enjoyable, a greater priority, or easier to participate in?

Please write your answer here:

How much time, on average when you are awake, do you spend sitting each day?

Please choose only one of the following:

- less than average of 4 hours of sitting time each day
- an average of between 4-6 hours of sitting time each day
- an average of between 6.5-8 hours of sitting time each day
- an average of more than 8 hours of sitting time each day
- Other

How much time, on average, do you spend each day on screen time (television, phone, tablet or computer)?

Please choose only one of the following:

- Less than 30 minutes per day
- An average of 31-60 minutes per day
- An average of 61-90 minutes per day
- An average of 91-120 minutes per day
- More than an average of 120 minutes per day
- I do not have a television, phone, tablet, computer or online access
- Other

Do you use any of the following social media apps, and if so, for how long on average, each day?

Please choose the appropriate response for each item:

Less than 30 minutes/day	Between 31-60 minutes/day	Between 61-90 minutes/day	Between 91-120 minutes/day	More than 120 minutes/day

Instagram

Less than 30 minutes/day	Between 31-60 minutes/day	Between 61-90 minutes/day	Between 91-120 minutes/day	More than 121 hours/day
-----------------------------	------------------------------	------------------------------	-------------------------------	----------------------------

Snapchat

YouTube

Twitter

TikTok

Facebook

Pinterest

Whatsapp

Screen time- Please respond to the statements below as they relate to your screen time from 1= strongly disagree to 5= strongly agree.

Please choose the appropriate response for each item:

1-Strongly Disagree	2	3	4	5- Strongly Agree
------------------------	---	---	---	-------------------------

The time I spend on my phone, table or computer is an important part of my social life.

The time I spend on my phone, table or computer is important for my academic performance.

The time I spend on my phone, table or computer is important for my work.

The time I spend on my phone, table or computer is important for expanding my knowledge of current events.

All about sleep!

The following questions relate to your sleep patterns and habits, and factors that influence your sleep.

What time do you go to bed on week nights?

Please write your answer here:

What time do you go to bed on weekend nights?

Please write your answer here:

How long does it take you to fall asleep after getting into bed?

Please choose only one of the following:

- Less than 20 minutes
- Between 20-40 minutes
- Between 41-60 minutes
- More than an hour
- Other

Tick any activities you do while in bed waiting to fall asleep.

Please choose all that apply:

- Scroll the internet or social media feed on my phone.
- Play video games on my phone or tablet.
- Send text messages to friends.
- Read a book.
- Do homework.
- Listen to music or a podcast.
- Meditate or pray.
- None of the above, as I fall asleep almost immediately
- Other:

How many hours do you usually sleep on a weeknight?

Please choose only one of the following:

- Less than 4 hours
- 4-5 hours
- 5.1-6 hours
- 6.1-7 hours
- 7.1-8 hours
- 8.1-9 hours
- 9.1-10 hours
- 10.1-11 hours
- More than 11 hours
-

How many hours do you usually sleep on a weekend night?

Please choose only one of the following:

- Less than 4 hours
- 4-5 hours
- 5.1-6 hours
- 6.1-7 hours
- 7.1-8 hours
- 8.1-9 hours
- 9.1-10 hours
- 10.1-11 hours
- More than 11 hours

Do you share a room for sleeping with anyone at night?

Please choose only one of the following:

- No, I sleep in a room on my own.
- I sleep in a room that I share with my brother or sister.
- I sleep in a room that I share with one or both of my parents.
- I sleep in a room that I share with one or both of my grandparents.
- I sleep in a room that I share with another person not mentioned above.

Which of the statements below best describes how you wake up in the morning?

Please choose only one of the following:

- I wake up by myself.
- An alarm wakes me up.
- My parents or family members wake me up.

Sleep habits- Please respond to the statements below as they relate to your sleep habits from 1= strongly disagree to 5= strongly agree.

Please choose the appropriate response for each item:

1-Strongly Disagree	2	3	4	5- Strongly Agree
------------------------	---	---	---	-------------------------

I feel that I get enough sleep each night.

I sleep soundly and rarely wake up during the night.

I feel anxious or afraid when it is time to go to sleep.

I avoid going to bed even though it is time to go to sleep.

When I wake in the morning, I feel rested and ready for the day.

I often get sleepy during the day and sometimes fall asleep in class.

I would prefer for school to start later, even if I have to finish the day later.

All about your well-being and happiness!

The following statements relate to your well-being, quality of life, and happiness. Choose the response that best represents how you feel (Strongly disagree= 1 to Strongly agree =5).

The following statements relate to your well-being, quality of life, and happiness. Choose the response that best represents how you feel (Strongly disagree= 1 to Strongly agree =5).

Please choose the appropriate response for each item:

1-Strongly Disagree	2	3	4	5- Strongly Agree
------------------------	---	---	---	-------------------------

I am happy at home and in my relationships with my family

I am able to do the things that I choose to do in my free time.

I get on well with my peers at school.

I have close friends who rely on me and who come to me when they

1-Strongly Disagree 2 3 4 5-Strongly Agree

need help.

I am satisfied with my academic performance at school.

In general, my health is ...

Please choose the appropriate response for each item:

Poor-1 2 3 4 Excellent - 5

Overall, I would rate my happiness on a scale of 1-5, from 1=Extremely unhappy to 5=Most happy that I can be.

Please choose the appropriate response for each item:

Extremely unhappy - 1 2 3 4 Most happy that I can be - 5

Submit your survey.
Thank you for completing this survey.

ANNEXURE D Discovery Walks (EpiCollect)

The collage displays the following screens from the EpiCollect app:

- Project Overview:** Shows the project name 'EpiCollect Project' and a list of projects.
- Welcome Message:** A text box explaining the purpose of the discovery walks and the importance of providing accurate information.
- School Name:** A screen asking 'What is the name of your school?' with a text input field and a 'NEXT' button.
- Date:** A screen asking 'What is today's date?' with a date picker and a 'NEXT' button.
- Time:** A screen asking 'What time is it?' with a time picker and a 'NEXT' button.
- Group Size:** A screen asking 'How many (often) scientists are in your group?' with a numeric input field and a 'NEXT' button.
- Group Name:** A screen asking 'Please give us the names of the members of your group. Remember that all names will be made confidential.' with a text input field and a 'NEXT' button.
- Location:** A screen asking 'Photo 1: Location' with a map view and a 'NEXT' button.
- Photo 1:** A screen asking 'Photo 1: Please describe what this photo shows and the location why you have included it.' with a text input field and a 'NEXT' button.
- Photo 2:** A screen asking 'Photo 2: Please describe what this photo shows and the location why you have included it.' with a text input field and a 'NEXT' button.
- Photo 3:** A screen asking 'Photo 3: Please describe what this photo shows and the location why you have included it.' with a text input field and a 'NEXT' button.
- Photo 4:** A screen asking 'Photo 4: Please describe what this photo shows and the location why you have included it.' with a text input field and a 'NEXT' button.
- Photo 5:** A screen asking 'Photo 5: Please describe what this photo shows and the location why you have included it.' with a text input field and a 'NEXT' button.
- Photo 6:** A screen asking 'Photo 6: Please describe what this photo shows and the location why you have included it.' with a text input field and a 'NEXT' button.

ANNEXURE E HOME-ENVIRONMENT BOOKLET - Will insert once in PDF form



ANNEXURE F - Social network survey

YEBO-SPAN - ABOUT YOU - Social Network Survey

There are 30 questions in this survey.

Demographics

Surname *

Please write your answer here:

This is a question help text.

Name *

Please write your answer here:

Birthday Date:

Please enter a date:

Age (Years) *

Only numbers may be entered in this field.

Please write your answer here:

•

Gender

Choose one of the following answers

Please choose only one of the following:

- Female
- Male
- Non-binary
- Prefer not to say

TELL US ABOUT YOURSELF:

Choose up to 3 characteristics from the list that, in your opinion, best describe you or choose your own words:

Select all that apply

Please select at most 3 answers

Please choose all that apply:

- Curious
- Smart, Clever
- Fast
- Quiet
- Helpful
- Creative
- Aggressive
- Cool, chilled
- Popular
- Sporty
- Fit
- Stressed
- Adventurous
- Shy
- Clumsy
- Brave
- Popular
- Serious
- Funny
- Caring, Kind
- Knowledgeable
- Trustworthy
- Selfish
- Responsible
- Non-judgemental
- Health-conscious
- Generous

TELL US ABOUT THE SUPPORT YOU GET FOR HEALTHY EATING

Choose up to 3 persons from any of the following lists, that you would turn to ask for

advice or support or confide in, about healthy eating, your weight or your body shape.

Select all that apply

Please select at most 3 answers

Please choose all that apply:

- **Mother**
- **Father**
- **Step-father or mother**
- **Grandmother**
- **Grandfather**
- **Uncle**
- **Aunt**
- **Brother**
- **Sister**
- **Cousin**
- **Godmother**
- **Godfather**
- **Faith-based leader**
- **Neighbour**
- **Coach, music, dance teacher**
- **Youth group leader**
- **Employer**
- **Local business person**
- **School teachers**
- **Family doctor or clinic staff**
- **After school tutor**
- **Social worker or counsellor**
- **Local Police**
- **Best friend**
- **Youth club member**
- **Sporty classmate**
- **Popular classmate**
- **Smart, Clever classmate**
- **Fit classmate**
- **Cool, chilled classmate**
- **Trustworthy classmate**
- **Kind, caring classmate**
- **Health-conscious classmate**
- **I don't speak to anyone about these topics.**
- **Other:**

Reason for selecting person 1:

Choose one of the following answers

Please choose only one of the following:

- Advice
- Empathy
- Knowledge
- Support
- Role Mode
- Resources
- Other

Reason for selecting person 2:

Choose one of the following answers

Please choose only one of the following:

- Advice
- Empathy
- Knowledge
- Support
- Role Mode
- Resources
- Other

Reason for selecting person 3:

Choose one of the following answers

Please choose only one of the following:

- Advice
- Empathy
- Knowledge
- Support
- Role Mode
- Resources
- Other

TELL US ABOUT THE SUPPORT YOU GET FOR BEING PHYSICALLY ACTIVE

Choose up to 3 persons from any of the following lists, that you would speak to for advice or support about physical activity or that encourages you to be physically active.

Select all that apply

Please select at most 3 answers

Please choose all that apply:

- Mother
- Father
- Step-father or mother
- Grandmother
- Grandfather
- Uncle
- Aunt

- Brother
- Sister
- Cousin
- Godmother
- Godfather
- Faith-based leader
- Neighbour
- Coach, music, dance teacher
- Youth group leader
- Employer
- Local business person
- School teachers
- Family doctor or clinic staff
- After school tutor
- Social worker or counsellor
- Local Police
- Best friend
- Youth club member
- Sporty classmate
- Popular classmate
- Smart, Clever classmate
- Fit classmate
- Cool, chilled classmate
- Trustworthy classmate
- Kind, caring classmate
- Health-conscious classmate
- I don't speak to anyone about these topics.
- Other:

Reason for selecting person 1:

Choose one of the following answers

Please choose only one of the following:

- Advice
- Empathy
- Knowledge
- Support
- Role Model
- Resources
- Other

Reason for selecting person 2:

Choose one of the following answers

Please choose only one of the following:

- Advice
- Empathy
- Knowledge
- Support
- Role Model
- Resources
- Other

Reason for selecting person 3:

Choose one of the following answers

Please choose only one of the following:

- Advice
- Empathy
- Knowledge
- Support
- Role Model
- Resources
- Other

TELL US ABOUT THE SUPPORT YOUR YOUR MENTAL WELL-BEING

Choose up to 3 persons from any of the following lists, that you would speak to for advice or support about your mental well-being, your self-image or your self-confidence.

Select all that apply

Please select at most 3 answers

Please choose all that apply:

- Mother
- Father
- Step-father or mother
- Grandmother
- Grandfather
- Uncle
- Aunt
- Brother
- Sister
- Cousin
- Godmother
- Godfather
- Faith-based leader
- Neighbour
- Coach, music, dance teacher
- Youth group leader
- Employer
- Local business person

- School teachers
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- Sporty classmate
- Popular classmate
- Smart, Clever classmate
- Fit classmate
- Cool, chilled classmate
- Trustworthy classmate
- Kind, caring classmate
- Health-conscious classmate
- I don't speak to anyone about these topics.
- Other:

Reason for selecting person 1:

Choose one of the following answers

Please choose only one of the following:

- Advice
- Empathy
- Knowledge
- Support
- Role Model
- Resources
- Other

Reason for selecting person 2:

Choose one of the following answers

Please choose only one of the following:

- Advice
- Empathy
- Knowledge
- Support
- Role Model
- Resources
- Other

Reason for selecting person 3:

Choose one of the following answers

Please choose only one of the following:

- Advice

- Empathy
- Knowledge
- Support
- Role Model
- Resources
- Other

TELL US ABOUT BARRIERS (LIMITATIONS) YOU EXPERIENCE FOR HEALTHY EATING

Choose up to 3 persons/situations from any of the following lists that do not support (your) healthy eating or pressure you to eat unhealthy foods and snacks.

Select all that apply

Please select at most 3 answers

Please choose all that apply:

- Mother
- Father
- Step-father or mother
- Grandmother
- Grandfather
- Uncle
- Aunt
- Brother
- Sister
- Cousin
- Godmother
- Godfather
- Faith-based leader
- Neighbour
- Coach, music, dance teacher
- Youth group leader
- Employer
- Local business person
- School teachers
- Family doctor or clinic staff
- After school tutor
- Social worker or counsellor
- Local Police
- Best friend
- Youth club member
- Sporty classmate
- Popular classmate
- Smart, Clever classmate
- Fit classmate

- Cool, chilled classmate
- Trustworthy classmate
- Kind, caring classmate
- Health-conscious classmate
- I don't speak to anyone about these topics.
- Other:

Reason for selecting person 1:

Choose one of the following answers

Please choose only one of the following:

- Food preparation
- Food purchases
- Culture/tradition
- Lack of choice
- Lack of funds
- Lack of knowledge
- Lack of support
- Not a priority
- Peer pressure
- Other

Reason for selecting person 2:

Choose one of the following answers

Please choose only one of the following:

- Food preparation
- Food purchases
- Culture/tradition
- Lack of choice
- Lack of funds
- Lack of knowledge
- Lack of support
- Not a priority
- Peer pressure
- Other

Reason for selecting person 3:

Choose one of the following answers

Please choose only one of the following:

- Food preparation
- Food purchases
- Culture/tradition
- Lack of choice
- Lack of funds
- Lack of knowledge

- Lack of support
- Not a priority
- Peer pressure
- Other

TELL US ABOUT BARRIERS (LIMITATIONS) YOU EXPERIENCE IN BEING PHYSICALLY ACTIVE

Choose up to 3 persons/situations from any of the following lists that do not support (your) you in being physically active.

Select all that apply

Please select at most 3 answers

Please choose all that apply:

- Mother
- Father
- Step-father or mother
- Grandmother
- Grandfather
- Uncle
- Aunt
- Brother
- Sister
- Cousin
- Godmother
- Godfather
- Faith-based leader
- Neighbour
- Coach, music, dance teacher
- Youth group leader
- Employer
- Local business person
- School teachers
- Family doctor or clinic staff
- After school tutor
- Social worker or counsellor
- Local Police
- Best friend
- Youth club member
- Sporty classmate
- Popular classmate
- Smart, Clever classmate
- Fit classmate
- Cool, chilled classmate
- Trustworthy classmate

- Kind, caring classmate
- Health-conscious classmate
- I don't speak to anyone about these topics.
- Other:

Reason for selecting person 1:

Choose one of the following answers

Please choose only one of the following:

- Culture/tradition
- Feel Embarrassed
- Feel incompetent
- Lack of funds
- Lack of knowledge
- Lack of safety
- Lack of support
- Lack of time
- Not a priority
- Peer pressure
- Other

Reason for selecting person 2:

Choose one of the following answers

Please choose only one of the following:

- Culture/tradition
- Feel Embarrassed
- Feel incompetent
- Lack of funds
- Lack of knowledge
- Lack of safety
- Lack of support
- Lack of time
- Not a priority
- Peer pressure
- Other

Reason for selecting person 3:

Choose one of the following answers

Please choose only one of the following:

- Culture/tradition
- Feel Embarrassed
- Feel incompetent
- Lack of funds
- Lack of knowledge
- Lack of safety

- Lack of support
- Lack of time
- Not a priority
- Peer pressure
- Other

TELL US ABOUT BARRIERS (LIMITATIONS) YOU EXPERIENCE TO YOUR MENTAL WELL-BEING

Choose up to 3 persons/situations from any of the following lists that you feel interfere with or act as a barrier to your mental well-being, your self-image or your self-confidence.

Select all that apply

Please select at most 3 answers

Please choose all that apply:

- Mother
- Father
- Step-father or mother
- Grandmother
- Grandfather
- Uncle
- Aunt
- Brother
- Sister
- Cousin
- Godmother
- Godfather
- Faith-based leader
- Neighbour
- Coach, music, dance teacher
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- Popular classmate
- Smart, Clever classmate
- Fit classmate
- Cool, chilled classmate

- Trustworthy classmate
- Kind, caring classmate
- Health-conscious classmate
- I don't speak to anyone about these topics.
- Other:

Reason for selecting person 1:

Choose one of the following answers

Please choose only one of the following:

- Culture/tradition
- Feel Embarrassed
- Feel incompetent
- Lack of funds
- Lack of knowledge
- Lack of safety
- Lack of support
- Lack of time
- Not a priority
- Peer pressure
- Other

Reason for selecting person 2:

Choose one of the following answers

Please choose only one of the following:

- Culture/tradition
- Feel Embarrassed
- Feel incompetent
- Lack of funds
- Lack of knowledge
- Lack of safety
- Lack of support
- Lack of time
- Not a priority
- Peer pressure
- Other

Reason for selecting person 3:

Choose one of the following answers

Please choose only one of the following:

- Culture/tradition
- Feel Embarrassed
- Feel incompetent
- Lack of funds
- Lack of knowledge

- Lack of safety
- Lack of support
- Lack of time
- Not a priority
- Peer pressure
- Other

Submit

your

survey.

Thank you for completing this survey.

ANNEXURE G: YEBO-SPAN Pre-Post Advocacy Training Tool

A	Self-efficacy for health and advocacy behaviors	Rating Scale	
		Strongl y Disagre e	
	I am sure that I can talk to my friends about healthy eating		1
	I am sure I can talk to my friends about being physically active	Disagre e	2
	I am confident that I can work to make my school or community a better place for being physically active and eating healthy	Neutral Agree Strongl y Agree	3 4 5
B	Perceived control for Active participation	Strongl y Disagre e	
		Disagre e	
	I like to wait and see if someone else is going to solve a problem		1
	I find it very hard to talk in front of a group	Disagre e	2
		Neutral Agree Strongl y Agree	3 4 5
C	Perceived control for Optimism for change	Strongl y Disagre e	
		Disagre e	
	If i tell someone "in charge", like a leader, about my opinions, they will listen to me		1
	I enjoy participation because i want to have as much say as possible in my school or community	Disagre e	2
		Neutral Agree Strongl y Agree	3 4 5
D	Advocacy outcome efficacy	Strongl y Disagre e	
		Disagre e	
	This project can make a difference in making our school ot community a better place for being physically active and eating healthy		1
	This group can influence how people feel about	Disagre	2

nutrition or physical activity

e
Neutral 3
Agree 4
Strongl
y Agree 5

E Assertiveness

I can talk with adults about issues i believe in

Strongl
y
Disagre
e 1

I can ask others to help work on making our school or
community healthier

Disagre
e 2
Neutral 3
Agree 4
Strongl
y Agree 5

F Participatory competence and decision making

I can start discussions with others about how to
change our school or community to make it healthier

Strongl
y
Disagre
e 1
Disagre
e 2
Neutral 3
Agree 4
Strongl
y Agree 5

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Supplementary Files

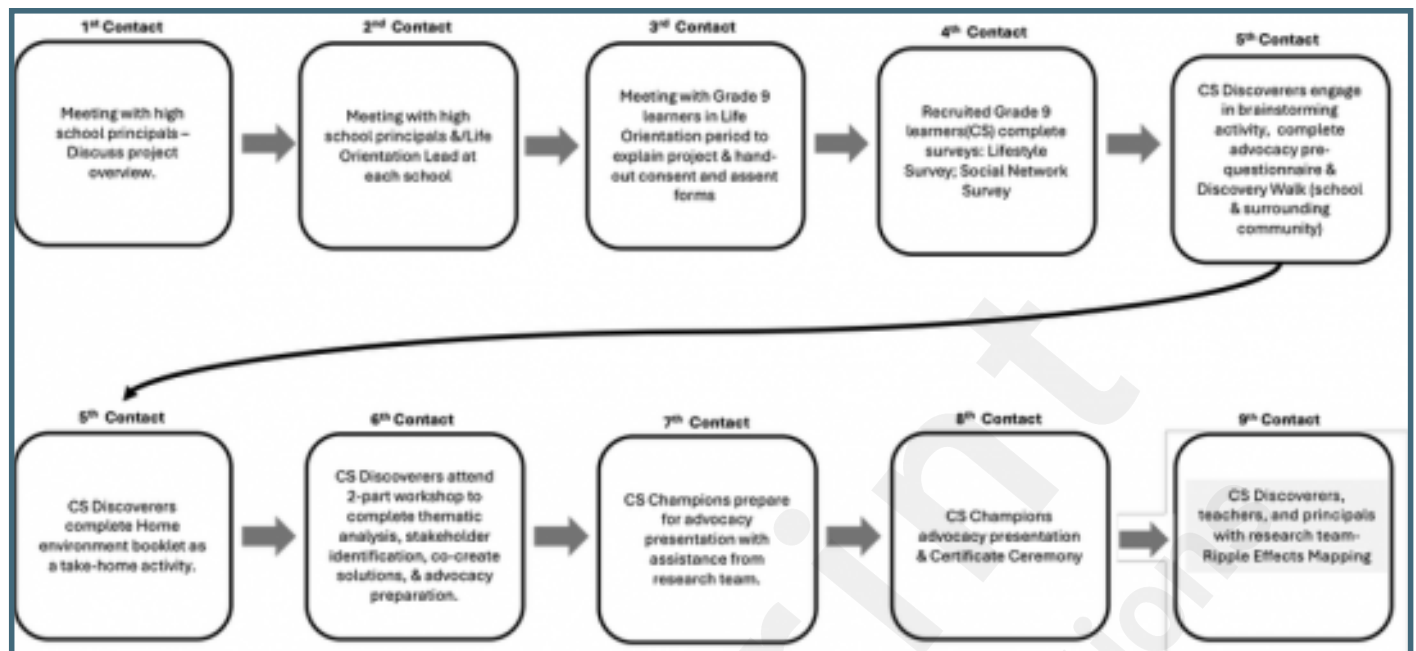
Figures

Western Cape Education Department Specific Learning Outcomes for Senior Phase Life Orientation.

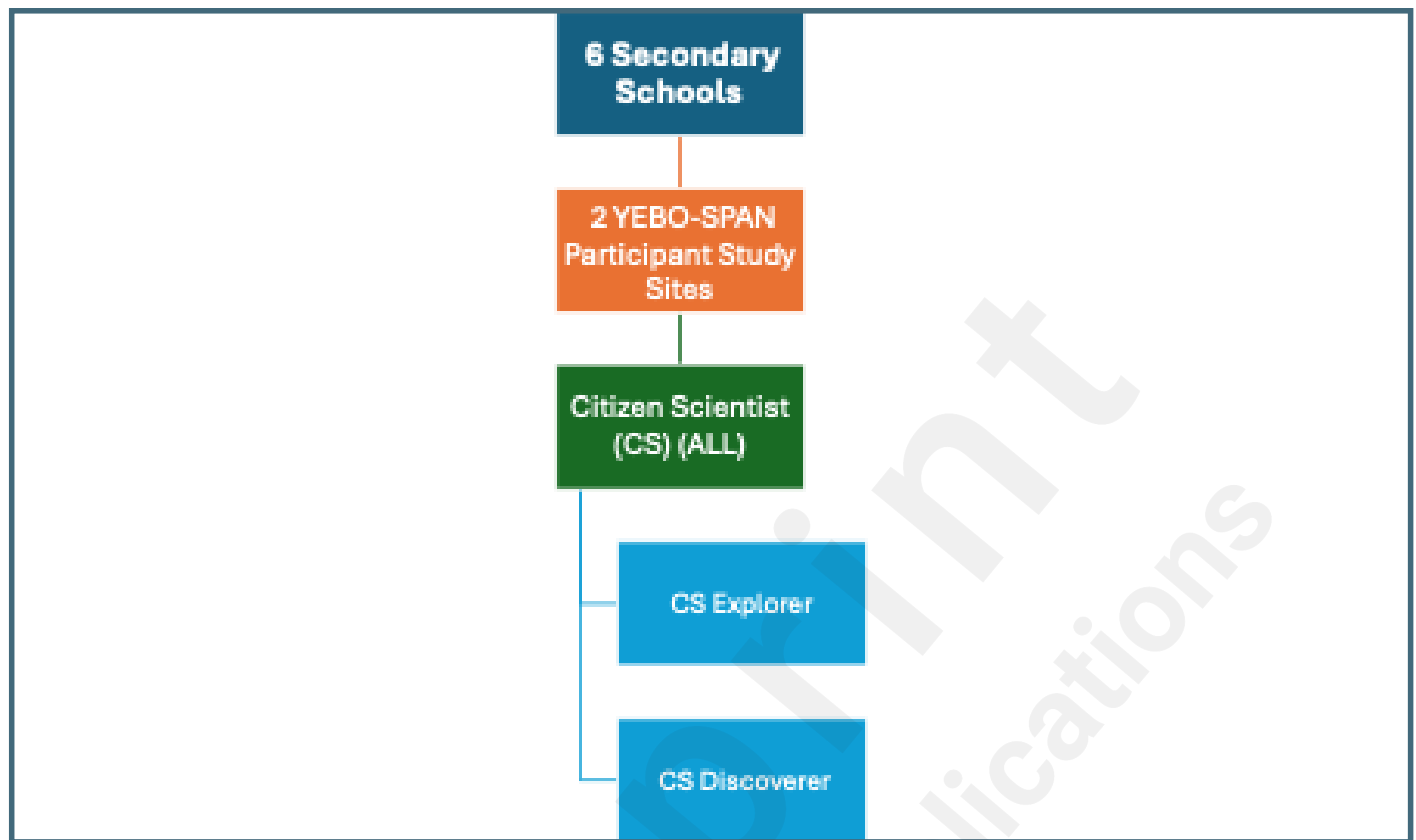
Fundamentals To be Prioritised	Life Orientation Grade 7-9: Proposed Topics/Concepts Per Priority
Development of Self in Society	• Concepts: personal diet and nutrition • Goal-setting skills: personal lifestyle choices • Challenging situations: depression, grief, loss, trauma crisis and anxiety
Health, Social and Environmental Responsibility	• Basic hygiene principles of COVID-19 • Substance abuse • Concept: environmental health • Common diseases: TB, diabetes, epilepsy, obesity, anorexia, HIV and AIDS including COVID-19 • Management of tuberculosis, diabetes, epilepsy, HIV and AIDS including COVID -19 • Health and safety issues related to violence
Constitutional Rights and Responsibilities	• Human rights as stipulated in the South African Constitution • Dealing with abuse
World of Work	• Time-management skills • Reading and writing for different purposes • Options available after completing Grade 9 • Knowledge of the world of work • Career and subject choices • Study and career funding providers
Physical Education	• Participation and movement performance in an outdoor recreational activity • Safety issues relating to participation in recreational activities

Figure 1: Western Cape Education Department Specific Learning Outcomes for Senior Phase Life Orientation

YEBO-SPAN study workflow.



Participant recruitment schematic.



Data collection tools.

