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Jonathan Wang, Student

Mark Swanson, PhD, Committee Chair

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REVAMP IT: Utilization of Socioecological Approach to Combat Adolescent Obesity in Knott County, Kentucky

Capstone Project Paper

A paper submitted in partial fulfillment of the
requirements for the degree of
Master of Public Health
in the
University of Kentucky College of Public Health

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Project Abstract

The Kentucky River District Health Department proposes the implementation of REVAMP IT in four selected elementary schools in Knott County, Kentucky to improve subjective attitudes towards various aspects of health knowledge, physical activity, social support, and screen-time, as well as reduce biometrically measured television time and increased step count. REVAMP IT is an evidence-based program that utilizes the socioecological model of Public Health to target aspects of the individual, relational, and community level to facilitate changes from multiple aspects. Screen-time and physical activity goals will be individually set by students, and Knott County Elementary School teachers will be responsible for the development of an in-school curriculum that integrates components from various subjects to promote health education. Families will be approached by volunteers of local non-profit organizations for check-ins via in-home visits or telephone calls to collect data, as well as encourage social support and address concerns or suggestions on a personal level. REVAMP IT aligns with the mission of the Kentucky River District Health Department to protect, maintain, and promote the health of the people of the communities it serves. Short-term goals for REVAMP IT are to achieve biometric goals of screen-time as well as physical activity, and achieve subjective improvement (as measured by pre/post-tests, community forums) towards attitudes to physical activity, nutritional habits, access to facilities, and overall understanding of educational materials. Long-term outcomes of the project are to reduce overall rates of both adolescent and adult obesity in Knott County, as well promotion of a greater sense of community support and involvement, providing parents and students with the knowledge and willingness to participate in taking control of their health. Under the leadership of Jessica Cooper and the full-time Project Director, the Kentucky River District Health Department will pair with community organizations such as the Leslie, Knott, Letcher, Perry County Community Action Council (LKLP) and Knott County Tourism Commission to facilitate a smooth implementation of program components through the utilization of local resources and volunteers. Community leaders as well as representatives from the respective elementary schools include teachers and students will play a critical role in oversight and guidance of REVAMP IT. The results of the project will be shared to the community as well as local health departments with the possibility of seeking additional funding for implementation in other rural, low-income and resource-limited areas in Kentucky.

Target Population and Need

Childhood obesity is a significant issue in the United States, with lack of physical activity proving to be a large contributor. Although young children have demonstrated lower percentages of overweight and obesity, their numbers are still concerning, and interventions need to be conducted early to ensure that healthy habits are developed before they reach adolescence. The obesity rate among the cohort of children and adolescents aged 2-19 years old remains stable at 17%, affecting almost 13 million children across the nation [1]. It is important to clarify that classifications of overweight and obese in children are based off body mass index (BMI) when compared to other children of the same sex and age, as opposed to adults, who had strict cutoffs.

Over 36% of adults in the United States are obese and pass many environmental and behavioral influences on their children. [2] About one and three people adults gets little, if any physical activity – this statistic holds from worldwide, and is declining in high-income countries such as the United States as well as lower-middle income countries like China [2]. Health consequences of obesity are often severe and chronic, with obesity increasing the risk of high blood pressure, diabetes, high cholesterol, stroke, heart attack, mental illness, and all-cause mortality [1]. Most importantly, researchers show that some physical activity is better than none. Current guidelines by the Office of Disease Prevention and Health Promotion recommend at least 150 minutes of moderate intensity exercise a week or vigorous intensity for 75 minutes a week as adults, and 60 minutes a day of moderate or vigorous intensity as children and adolescents. Findings from a study in 2003 that used accelerometer tracking to measure physical activity in children noted that 42% of children ages 6-11 meet this 60 minutes a week recommendation. The startling fact holds that this number drops to 8% in children ages 12-15, and 7.6% in children ages 16-19. [3]

Kentucky is ranked 12th in obesity and above the national average, with an estimated 33.8% of adults that are obese. The prevalence of obesity among children 2 to 5 years of age in Kentucky was 15.7% (US average 8.4%) and 17.6% (US average 17%) among adolescents with childhood obesity in Kentucky being higher than the national averages. Comparatively in Knott County, 36.1% of adults 20

years and older self-reported a Body Mass Index (BMI) of 30 or greater [4]. These numbers were calculated from 4,475 reports in Knott County out of a total of 12,227 adults surveyed. In adolescents, 17.6% are considered obese which is closer to the national average of 17%. Comparatively, Kentucky is the fifth most obese state in the United States, with ranges varying from 13% in Oldham County to 44% in Knott County. Many factors likely contribute to the high prevalence of obesity in Knott County, including a substantial proportion of adults who could not perform work or household tasks due to physical, mental, or emotional problems (35% compared to 27% Kentucky average); few adults who meet recommended fruit and vegetable consumption guidelines (11% compared to 19% Kentucky average); and number of adults reporting no leisure-time physical activity (37% compared to 30% Kentucky average). Kentucky is behind national averages when it comes to youth meeting physical activity guidelines, as well as adults. According to the CDC State Indicator Report in 2014, 29.3% adults and 19.9% of youth self-reported no leisure-time physical activity. Additionally, 46.8% of adults and 22.5% of youth self-reported meeting the aerobic activity guidelines [5]. **Table 1** below shows Knott County specific data when compared to national averages. All reported data falls well below the national averages, which may be the result of various factors.

Table 1. Comparison of Physical Activity within Knott County, to Statewide, to Nationwide.

Report Area	Total Population Age 20	Population with no Leisure Time Physical Activity	Percent Population with no Leisure Time Physical Activity
Knott County, KY	12,230	4,684	37%
Kentucky	3,200,327	977,580	29.87%
United States	226,142,005	53,729,295	23.41%

Sociodemographic and environmental factors likely contribute to the prevalence of obesity and lack of physical activity in Knott County. In 2012, prevalence of poverty in Knott County was among the worst 10% of all counties in Kentucky. The median annual household income is substantially lower in Knott County (\$30,411) compared to the state (\$42,900). Over 75% of students in Knott County public schools qualify for free or reduced meals [6]. According to the US Census Bureau, from 2009-2013, only

42% of adults in Knott County had some college education, compared to 59% statewide. Health indicators are equally concerning in Knott County: in 2015, Knott County ranked 113 of 120 Kentucky counties in terms of health, with 26% of residents reporting poor health compared to 24% in the state [7]. Although not much hard data over the evidence childhood obesity in Knott County, these numbers can be related to the highest obesity rates in adults, considering that the community environment as well as behaviors are two major risk factors that influencing childhood obesity [8]. Inadequate consumption of fruits and vegetables, reduced amounts of physical activity, plus sociodemographic factors such as economic status and access to facilities may also contribute to significant obesity rates in Knott County. In addition, the lack of support of healthy habits from parents, schools, or even daycare centers as well as lack of exercise and consumption of nutritious foods is a likely contributor to high overall obesity rates in Knott County, thus we are inferring a similar parallel from the standpoint of childhood obesity.

My intervention, REVAMP IT (Reducing Views, Adding Moves and Positive Attitude) will be based on the socio-ecological approach to Public Health prevention, and pose as a multi-level, primary prevention program targeted at adolescent-aged children at Knott County Elementary Schools. Weight loss and physical activity will be encouraged through family involvement, incentives for achieving goals, screen time-monitoring, as well as utilization of physical fitness trackers. REVAMP IT will seek to improve overall health knowledge and behaviors in all Knott County students, as an attempt to develop normative behaviors that will lead to healthy individuals and an overall-sense of well-being; By targeting adolescents early, the long-term goal is to minimize the rates of adult obesity.

Several weight loss/health promoting initiatives have already been tried in Knott County, such as “Get Moving Emmalena”, an individual-level based approach encouraging increased physical activity and healthy eating habits towards staff at Emmalena Elementary School. [9]. A Family and Consumer Science Agent was asked to aid participants, distributing educational information and emphasizing the importance of topics such as exercise. Key principles to the program were to eat more fruits and vegetables, practice portion control, and to get moving. Over the seven-week course of the program, twenty staff members were informed of healthy eating habits, using health trackers such as MyPlate, healthy fast food options,

and a variety of other health topics. A total of 10% weight loss across participants was reported at the end of the seven weeks [8]. These results were impressive for an intervention that targeted only the individual, and sought to increase health knowledge primarily without targeting inter-personal, community, or larger relationships. Another intervention being funded in Knott County is “The Keys to Embracing Aging”, an individual, relational, and community-level approach seeking to reinforce the link between a healthy lifestyle and increased quality of life [9]. The program discourages unhealthy behaviors such as smoking and junk food, and teaches participants how their health-behaviors now will affect their future health and well-being. A major aspect of intervention is augmenting attitude, emphasizing the effects on relationships, social networks, stress, as well as mental and physical health. The program has been doing well from a knowledge standpoint, with 99% of participants reporting a better understanding of how lifestyle behaviors and choices are integrated. Also, “60 percent of participants reported aspirations to better embrace a positive attitude. 28 percent of participants reported the need to be healthier eaters and 53 percent declared the need to stay on top of their health numbers.” [9] Results from this program reinforce the importance of using a socio-ecological approach to targeting weight loss, physical activity and nutritious diets in adolescents; Social influences as well as relationships with others plays a large role in determining behavior in adolescents.

Knott County possess an adequate level of community involvement, support, and general receptiveness towards interventions geared towards changes in health behavior as evidenced by past programs. REVAMP IT will have the capability to reach approximately 1000 students across 5 elementary schools. It is proposed that roughly 700 students will be reached after full program dissemination, factoring in potential opt-outs from families in all schools. Emmalena Elementary will be the first pilot school that will receive the intervention, with approximately 234 students enrolled [13]. Elementary schools targeted include Beaver Creek Elementary, Carr Creek Elementary, Emmalena Elementary, Hindman Elementary, and Jones Fork Elementary, assuming roughly 70% participation. An opt-out option will be used rather than an opt-in, for the sole reason that promoting universal wellness and health shall benefit all children through primary prevention, not just those who are obese. This aspect will

be key to REVAMP IT as the community-wide intervention aims to change normative behaviors in primarily children K-8 and potentially avoid obesity with lifestyle changes, however a secondary goal is to reach all residents to an extent.

Program Approach

REVAMP IT focuses on the reduction of sedentary screen time with the primary focus of television time, maximizing physical activity through goal setting and pedometer tracking, educational resources provided in the school settings, and multi-level support at the community and parental level will also be implemented.

The effectiveness of this approach is summarized in a systematic review of 49 published studies from 2008-2013, conducted by the Community Preventive Services Task Force. Of the reviewed studies, 12 utilized “screen time only” interventions, while 37 investigated “screen time plus” interventions. The target population for these interventions is children 13 years and younger, however this program will expand the target audience to include students up to 18 years old [18]. The overall results showed that the interventions were effective across all arms, reducing the prevalence of obesity as well as minimizing disparities in weight among children with differing levels of socioeconomic status. Recently studies have shown that children aged 8-18 spend approximately 7.5 hours using entertainment media, 4.5 hours watching TV, 1.5 hours on the computer, and over 1 hour playing video games each day [14]. Promisingly, when parents set any kind of media rules limiting screen time, children’s media use is almost three hours lower each day [17].

Current research over screen time is highly variant, however there are some notable trends. Przybylski and colleagues collected and analyzed data from over 120,000 British teens, trying to distinguish a link between screen time and well-being. Validated self-report measures were completed that gauged time spent over various types of digital activities, including TV, computer and console-based games, surfing the web, and smartphone use for social activities. Surprisingly, statistical methods indicated that there was not a directly linear relationship – teen’s well-being increased as their screen time increased, up to a certain point. On weekdays, these numbers averaged 1 hour and 40 minutes of video

games, 1 hour and 57 minutes of smartphone use and 4 hours and 17 minutes of computer use. More importantly, these associations on ‘tipping-points’ between screen time and well-being were not strongly demonstrated from a statically standpoints. The authors concluded that moderate screen time in adolescents is unlikely to convey any true risk towards well-being. Additionally, a German study conducted between 2002-2010 in 16,918 children aged 11 to 15 revealed that screen time has been increasing the last decade, with a decline in TV viewing but an increase in computer time [15]. The benefit of reduced TV screen time lies in the fact that there has been evidence correlation of unfavorable health behaviors with increased exposure to advertisements over snacking and unhealthy foods [15]. It is important to consider that screen time is not a homogenous behavior, and are associated with various health-related outcomes. Computer use and electronic media has been shown to be positively associated with peer relationships and time spent with friends, so the type of screen-time that we wish to limit must be distinguished.

The overall goal of REVAMP IT will be to reduce behaviors leading to obesity among adolescents in Knott County. By the end of the program, the following objectives will be assessed:

1. Subjective improvement (as measured by pre/post-tests, community forums) towards attitudes to physical activity, nutritional habits, access to facilities, and overall understanding of educational materials.
2. Reduction of electronic screen-time (television) by 10% as measured by a dedicated screen-time monitor and parent/guardian data.
3. Increase of physical activity in step count by 10% as measured by dedicated fitness trackers.

Parents and caregivers will be provided a screen-time monitor to place on the main family television, or the television in the bedroom, if present, as well as a physical screen-time chart to document their children’s behavior [17]. The first two weeks of monitoring will be used as a baseline, so that researchers are able to obtain a rough baseline value for screen-time for goal-setting as well as analyzing progress. Screen-time will be split into various sections of television, computer, video game, and handheld devices (phone, tablets). Since screen-time monitors are mainly feasible to be placed on the primary family

television, children and parents/guardians will be asked to self-report time spent on other devices.

Participants will be asked to set screen-time goals after two weeks of program implementation so that a baseline measurement can be assessed.

Along with setting goals for screen-time, students will also be expected to set feasible step goals as an objective measure of physical activity. Physical activity will be tracked by biweekly monitoring of step counts from a pedometer that is distributed during initial program initiation. Physical education teachers will be responsible for documenting these numbers when students attend class and distribute the data to the Program Director, so that steps can be documented and compared to individual goals. At the three-month mark of pedometer distribution, students who meet their step goals at least 3 of the 6 documented times will be provided a Misfit Wearables Flash, a fitness/sleep tracker worn on their wrist, to reward them for their hard work, incentivize further performance, and promote friendly competition within the school. For students who fail to reach their goals during the first cutoff for Misfit distribution, they will be given one more chance in another 3 months, given the same criteria for qualification.

The last major component of REVAMP it will include educational materials that are integrated into the school curriculum, so that teachers and students do not need to dedicate additional time outside of the classroom towards this component, and thus increase participation. REVAMP IT materials will be developed after program recruitment, by all teachers from the 4 targeted Knott County Elementary Schools. A 2-month summer workshop will be conducted that will allow teachers of individual grade levels and subjects to collaborate and to determine the most feasible and important aspects to incorporate into their curriculum, since these components will be universally integrated. The main reasoning for allowing flexibility in curriculum development is the assumption that these teachers are well-versed and familiar with the needs and capability of the students, both in terms of knowledge and attitudes. The workshop will meet at least weekly based on current progress; To encourage participation, \$20 gift cards will be given to all teachers upon attendance and participation of each session to those who choose not to utilize this program for professional development requirements; The Knott County Board of Education will be approached to allow this workshop to qualify for a professional development opportunity, to allow

for progress towards individual yearly goals as opposed to being strictly based on good-will volunteering. There will be adequate oversight from the Community Advisory Group as well as the KY River District Health Department to aid development of the in-school curriculum, and the health department will also function to screen the materials for language, age-appropriateness, and content prior to implementation in REVAMP IT. This component is largely targeted towards to the individual, which may be viewed as the least effective approach in the socio-ecological approach to Public Health prevention, however curriculum integration will also affect interpersonal factors by promoting discussion and interaction between peers.

A few example components that may be developed under the discretion of the Community Advisory Group and KY River District Health Department are listed below:

1. Additional one hour of outdoor physical activity (if weather permits) during physical education class weekly, or other indoor activities will be substituted including basketball, dodgeball, soccer, or jump rope.
2. Mathematics class will have a semester curriculum dedicated twice weekly to macronutrients/micronutrients including Recommended Daily Intake (RDI), reading nutrition labels, and calculations revolving around calorie or nutrition intake.
3. Language Arts/Health class will have a combined semester curriculum meeting twice weekly dedicated to chronic diseases, obesity, nutrition terms, and cardiovascular health.
4. Students meeting with their homeroom teachers biweekly for 30 minutes to assess progress, and make any changes necessary to their step goals, screen-time goals, or address any hardships they may be having with the REVAMP IT school curriculum. Meetings will be staggered as necessary to provide ample time to discuss questions. For example, if there are 25 students in each homeroom, 12 students may be scheduled on weeks 1 and 3 of the month, while 13 students may be scheduled on weeks 2 and 4 of the month.

Lastly, REVAMP IT will seek to incorporate additional resources and staffing into the 21st

Century Learning Center Academy. As an established resource under the Knott County School District, REVAMP IT will seek to recruit volunteers and increase the overall budget so more students are able to be accommodated, if necessary. This component will largely target the community aspect of the socioecological model of Public Health, providing parents and guardians that may not immediately be available when their children get home due to occupation or other commitments, with an opportunity to allow these students to further interact and socialize with students after school hours. The 21st Century Learning Center Academy will be available to all K-8 students and teachers/volunteers will be trained and informed about the REVAMP IT curriculum so students can receive help on schoolwork, as well increase their pedometer counts through physical activity. Based on established hours, the after-school program will be available from 3 PM – 5 PM on Monday through Thursdays. Due to a concern of lack of transportation, the KY River District Health Department will collaborate with the school district to seek one additional school bus solely for this purpose. Depending on the amount of interest and participation with parents and students, Leslie, Knott, Letcher, and Perry County Community Action Council (LKLP) volunteers will also be available to provide transportation.

The KY River District Health Department will also be pairing with the LKLP [5] to provide free public transportation (1 ride/month) for families involved in the program, for relevant purposes such as attending focus group meetings or community events. Volunteers of the LKLP will also be recruited to participate in the program, and will primarily conduct random in-home visits on a quarterly basis to assess family attitudes, document screen-time monitors, and reiterate the voluntary nature of the program as well as thank families for their continued participation. To minimize the invasiveness of this aspect, parents and guardians may choose to opt out of this aspect and phone calls will be conducted instead. As compensation, mileage will be reimbursed at \$0.25/mile and volunteers will be provided a \$50 gift card for each quarterly assessment that they conduct. The program will initially be piloted in Emmalena Elementary School, in the approximately 234 students enrolled. This will allow the KY River District Health Department, stakeholders, and well as parents and community partners to fully integrate and effectively manage the program components on a smaller scale before expanding to other participating

schools. Initially, students will respond to a pre-test (noted in **Table 3**), assessing knowledge over basic nutrition information, as well as providing baseline measures of physical activity, screen time and parental support. This will be conducted through access to the computer lab, to ensure that information is electronically recorded and allows for easier access and evaluation throughout the program.

Fidelity will be ensured through multiple aspects, primary by initially providing an orientation to all program staff, students, and parents involved in the program. Methods of the program and goals will be established for each student, as well as disclosure of providing screen-time monitors as well as fitness trackers for program monitoring. In terms of fidelity in teachers, they will be required to document student's progress in the curriculum and report to the Project Director. Assuming that a large number of teachers will be using REVAMP IT for Professional Development, they will be rewarded credit at the end of the intervention. To address fidelity in students, a school assembly will be scheduled every 2 months for all teachers and students involved in REVAMP IT, along with the CAG to recognize top performers from each component of the intervention. For example, the 5 individuals with the highest step count from baseline and largest reduction in screen time from their set goals will be offered prizes such as t-shirts and gift cards to grocery stores, or restaurants. These figures will not be disclosed during the assembly to discourage the possibility of objective shaming, but instead, the focus will be on the celebration of the student's accomplishments. In addition, at the end of REVAMP IT, the top school in terms of overall percentage of students that achieve their step goals, screen-time goals, and demonstrated significance in pre and post-test results will be rewarded by a large catering event, as well as two homerooms that will be randomly selected for a complete makeover in terms of furniture, classroom materials, and electronics. This school-wide reward will promote competition between schools in increasing dedication and effort towards REVAMP IT, with the overall goal to improve primary outcomes and participation from teachers, students, and families.

Sustainability of resources as well as interventions is crucial when addressing the long-term viability of proposed obesity interventions. Priorities to highlight include follow-up surveys of students to ensure that established programs in Knott County Elementary Schools are effective in promoting

healthy eating habits, physical activity, and decreasing the amount of sedentary screen time that students spend daily. On the topic of funding, the program component that will require the greatest monetary upkeep would be ensuring that program facilitators and teachers are properly trained and informed. This would include updates on the educational sessions that are provided to students, as well as monthly compensation for counselors and teachers participating in the program if all their requirements are fulfilled. In the initial stages of the program, a set of LKLP volunteers will be trained to properly conduct follow-up monitoring of program participants, as well as addressing the concerns/needs of parents. Costs will be minimized due to only 2 counselors being trained, per elementary school. In the initial stages of the program as stated previously, implementation of interventions will only take place in a single school, with reevaluations conducted quarterly to determine if funds are appropriate to expand the program, and if adjustments are necessary to optimize existing programs. One of the greatest challenges to sustainability is arguably the recruitment of teachers and individuals in the community to take part in the intervention. Knott County is relatively small and rural, lacking the amount of resources of larger counties, like Fayette. A monetary supplement will be offered to stimulate interest, however it is crucial that these individuals possess an innate desire to facilitate change, as well as provide guidance and support. As noted previously, compensation will only be provided after documentation of compliance with the curriculum, as well as reporting to the monthly Committee Advisory Group Meeting.

The main objectives would include endorsement and feedback from parents and school staff as well as gauging feasibility and interest through families and students during the initial focus group discussion before program implementation. Perhaps largest risk of the program will be a general lack of interest in the public to participate in the program. An opt-out policy that will be utilized, it is likely that enrollment rates will be higher, however due to current plans of implementing the program in only one of the seven district schools at a time, the continuation of the project will be determined largely by the initial response. Advertising and endorsements from key opinion leaders in the community will have significant effects in raising awareness about the project, as well as facilitate participation to improve overall health.

Performance Measures and Evaluation

The success of REVAMP IT will be evaluated using both a process and outcome evaluation. Process evaluation will include quarterly focus group sessions between the KY River District Health Department, teachers, and parents/students, while a Community Forum will also be conducted at the culmination of the program at each school. Initially, there were plans to place designated parents onto the Community Advisory Group to advocate the views of the target population, however the main concern stemmed from eventual disinterest in participation, or even misrepresentation of the population. For this reason, the parents and students will be represented quarterly for any families that wish to attend these focus groups. The Project Director in collaboration with the Project Coordinator and KY River District Health Department, will also be responsible for preparing a report at the 18-month mark of the 3-year grant (1 year after initiation in Emmalena Elementary School) and present the results at the Community Forum consisting of all program participants, their families, and staff involved in REVAMP IT. The first hour of the forum will be dedicated to students and their families, while the remaining time will be meant for discussion between the Community Advisory Group and staff. Several aspects that will be included in the report involve strengths and weaknesses of the intervention, and methods to increase participation and retention of both participants and staff. As noted earlier, the opt-out method of REVAMP IT will assume that students will participate unless parents respond through a physical form mailed home with a prepaid return to the Community Advisory Group stating their refusal, or through an electronic link provided by schools.

The pre and post-test created by the KY River District Health Department must be screened through the CAG as well as participating staff/teachers at Emmalena Elementary School in order to ensure that they are comprehensible and appropriate for children. Specific attention will be provided to grammar, word choices, and slang to alleviate any confusion or miscommunication which would bias the results. A pre and post-test for the other major component of the program, a reduction in screen time/sedentary time, would also be a good indicator of progress and feasibility of the program. Students

as well as parents would be asked to estimate their average screen time every day, and that time will be compared to their response after the intervention.

A needs assessment will be conducted via the initial focus group discussion as well as through the initial pre-test administered to students. Specifically, this would be able to provide a general idea about how feasible the school component of the program is. For example, if a large majority of the students are well-versed in information over physical activity, diet, and exercise, then this component of the program will be deemphasized and targeted more towards what the population needs, such as increasing access to facilities/parks or prioritizing screen-time and physical activity interventions. This will be fully conducted in months 2-4 of the grant proposal as noted in the timeline table above. Administration of the middle and high schools will report their findings and data directly to the Knott County Health Department, and a link for an online version will be provided for students and families that want the convenience of completing the pretest at home. For students that don't complete the pre-test at school, a copy will either be mailed to households that have a participant in the intervention or they will be sent home with the student if enrolled in a participating school. Families will be given the option to either return the completed survey back to school administration with the student, or mail the copy directly to the Health Department in a prepaid envelope provided.

This data will be collected at different increments during the span of the intervention – focus groups will be conducted quarterly to assess for program feasibility, feedback, as well as monitoring of progress and changes in the target population. At the end of the one year intervention at Emmalena Elementary Schools, students and families will be provided a link to an online survey over general feedback towards the intervention, as well as the impact REVAMP IT has had on lifestyle/attitudes changes towards intervention topics. The primary outlet of data collection emphasized will be electronic, thus students will have the opportunity to use school computers to complete surveys and tests. It should also be noted that all trained staff and administration that are involved in the intervention will also be surveyed quarterly, and they will be given the opportunity to comment on any changes or any findings that they deem are significant such as collaborative disinterest in a portion of the curriculum, or lack of

involvement during class time. Additionally, the Health Department itself will be conducting economic evaluations to ensure that the program is running within its given budget, any alterations and adjustments will be performed if formative and process evaluations negative overall and the process also has a negative impact on the budget. Depending on the response rates of the adolescents and families of the community, the program is aiming for at least a 50% participation rate for evaluation surveys. Outcome goals for the project include:

1. Reduction of electronic screen-time (cell phones, computers, television) by 10% as measured by a dedicated screen-time monitor and parent or guardian data
2. Increase of physical activity in step count by 10% as measured by dedicated fitness trackers
3. Subjective improvement (as measured by pre and post-tests) towards attitudes to physical activity, access to facilities, and overall understanding of educational materials

Adolescents will be allowed to keep the Misfit Wearables Flash activity trackers that are distributed after 6 months of program implementation and encouraged to continue to use them and periodically report their data back to the Knott County Health Department via an online link as well as through their respective schools. In this fashion, long term impact of the program will be assessed, however this method is not entirely reliable because it is dependent upon the voluntary cooperation of participants, even after the intervention has been completed.

Outcomes measured for evaluating this project include attitudinal, knowledge, and behavioral variables. This will be primarily assessed from the pre-test and post-test, as a sum of their score differences between baseline values of physical activity, screen-time, and subjective assessment of post-test improvement. For example, the pre and post-test will contain sections of questions that pertain to knowledge and attitudes towards categories of physical activity, overall health knowledge, screen-time assessment, as well as attitudes towards the latter. To demonstrate the efficacy of the program, obesity rates of Knott County will be compared to Kentucky, as well as surrounding counties during a final evaluation. The reported data from the Misfit Wearables fitness trackers will be evaluated for step count

as well as minutes of physical activity, and assessed for individual improvement as well as compared with the federal recommendations by the CDC.

In terms of monitoring screen-time, a special device will be purchased by the school district, and linked at the main household television set or bedroom television, if present. Parents and guardians will be informed at the initial informative meeting before program implementation to attempt to be more aware of their children's behaviors at home, such as noting that student "X" has spent less time playing video games recently and has gone outside to play with his friends several times this week. A member of the LKLP will plan on going to each household with one of these devices every quarter to monitor data collection, usage of educational materials, and to ensure the feasibility of the device. As stated previously, if families do not opt-in due to concerns of invasiveness, phone calls will be conducted instead. To promote flexibility within the program, families will also be allowed to monitor screen time themselves using dedicated applications that can be downloaded to their mobile devices or computers. Based on the number of willing participants that choose to use this method, this portion of the invention likely has the highest risk of being removed from the program during revisions due to inconsistency, as well as proving to be a time-sink; researchers must dedicate precious time and resources traveling to households periodically to assess whether or not screen time is being documented.

Post-test administration will be very similar to the administration of the pre-test; namely, students will be allowed to complete the survey electronically during in-school hours, and a physical copy will be mailed home to families if the student is not present during administration with a prepaid envelope for return. The information contained in the post-test will be very similar to the pre-test, in order to determine how well the adolescents changed their behaviors, namely education over key subjects such as diet and physical activity, estimated time performing physical activity as well as estimated screen time during the week, and any other associated attitudes that they have noticed that have changed over the course of the intervention.

A problem that can be foreseen in evaluation of the program, is the largely self-reported data that will be collected on a quantitative basis, as well as biometric data. Although this data will be able to be

analyzed for significance, a temporary increase in pedometer/fitness tracker measurements by students will not necessarily indicate that they will be more inclined to be actively involved in these activities after REVAMP IT is concluded. Likewise, screen-time across all devices will be monitored, with a significant focus on the main household television set or bedroom television, if present. Expectancy bias or even mere incentives from rewards at school such as t-shirts and wrist-bound fitness trackers may lead to positive changes that are not sustainable. For these reasons, behavioral and attitudinal data reported by the pre-test and post-test will likely be the most reliable source for indication of the success of REVAMP IT. By utilizing the socioecological approach and providing interventions at an individual, relational, and community level, REVAMP IT combines portions of successful evidence-based interventions with similar targets of promoting physical activity and reducing sedentary screen-time in adolescents.

To effectively and efficiently evaluate the impact and key successes and challenges of the program, a biostatistician will be hired for the outcome evaluation. As stated above, because a portion of the data being used to implement changes during the implementation will purely be quantitative as well as subjective opinions given by students or their families, it is important to ensure that there are a second set of eyes that are used to assess the success of the intervention after REVAMP IT is completed. More research will be conducted before the program is finalized, particularly highlighting potential candidates for this task, as well as a cost-analysis that needs to be performed in estimating the range of associated cost that hiring a third-party will entail. If this method is not attainable due to budgetary limitations, the same initial evaluation/implementation team will be used for the process evaluation at the end as well. Benefits to using this method are the familiarity that these researchers will have, both over the subjects as well as the methods and processes that were used and modified during the implementation phase.

Depending on the established success or even failure of the program, another critical aspect will be the documentation of all processes, evaluations, data collected, as well as opinions generated from the experts that perform the majority of ongoing program evaluation. In terms of a successful program, this information can be given to other health departments in other counties at high-risk for adolescent obesity rates, and can be tailored to specific populations based on available budget, population, and number of

researchers and evaluators that are recruited to participate. Any potential failures with interventions or drop-out rates, negative opinions for participants/families can be factored into the failure during process evaluation, and overall lessons learned can be adequately generated from the availability of this data. Once an adequate budget is available again, other rural counties or high-risk populations that is willing to attempt an intervention towards reducing obesity rates, will be able to use the data that was extrapolated from our sample of middle and high-school aged adolescents. Specifically, surrounding KY River District counties with similar demographics and socioeconomic status will be able to extrapolate the results, however the intervention may also be slowly adapted for various other populations, after data is collected. Information over average age, family educational level, demographics, mean income, and various other social factors will be documented with the evaluation, so that future researchers will be able to tailor an intervention that best suits the type of participants that are enrolled. At the conclusion of the three-year period of REVAMP IT, the Knott County Health Department will be given the opportunity to maintain follow-up with the program with additional grant funding, as well as implementation in other Knott County schools and data tracking to determine long-term impact.

Capacity of Applicant Organization

The mission of the KY River District Health Department is to ‘protect, maintain, and promote the health of the people of the community.’ Notable internal divisions include regional epidemiology, health education, nutrition services, and nursing administration which serves Knott, Lee, Leslie, Letcher, Owsley, Perry, and Wolfe counties (approximately 95,000 individuals), providing free clinics, educational events, immunizations, and various other services such as home health. To better connect with their target populations, the KY River District Health Department employs seven individual coordinators for the seven counties served, to develop invaluable relationships with the community, and attempt to close the gap in health disparities among an underserved population by providing various opportunities for self-care, screening, and health education. The KY River District Health Department’s role in the integration of REVAMP IT is consistent with its mission and values, and their efforts will aid further implementation in the future in surrounding high-risk counties.

Several children's health programs have already been implemented in the region, with direct oversight from the KY River District Health Department. Of note, school health programs have been implemented in all served counties, with a Registered Nurse available during school hours for medication administration and routine procedures such as first aid, sick visits, and health education. Registered Dietitians, Nutritionists, and Health Educators are available resources as well, who will play important roles during REVAMP IT as they work with school counselors to address any issues or concerns with children such as lack of motivation or insufficient social support. Well Child Care supports health checkups provided at no cost for Medicaid or Kentucky Children's Health Insurance Program (KCHIP) coverage. Physical and mental screenings are conducted, as well as assessment of immunizations, developmental screenings, dental work, and counseling over nutrition, safety, and age-related issues. REVAMP IT will work to promote these services and ensure that families are aware of these opportunities for themselves, and their children.

Partnerships and Collaboration

Due to the differing needs of specific populations and the deficiency of external validity in published research over Public Health behavioral interventions, involvement with a series of diverse and integral community partners is integral in assuring that REVAMP IT is successful.

Leslie, Knott, Letcher, Perry County Community Action Council (LKLP)

The LKLP is a private, non-profit corporation that functions as a Community Action Agency established by the Kentucky General Assembly in 1966. With headquarters in Hazard, Kentucky, the agency is governed by a 24-member Board of Directors comprised of 3 representatives of the private, local elected official, and low-income sectors of each county. LKLP offers over 26 federal, state, and local programs targeted to low-income and disadvantaged residents. Services offered include, but are not limited to non-emergency Medicaid transportation, housing and budget counseling, case management, and home energy assistance. The overall goal is to aid residents of the Commonwealth of Kentucky to achieve and maintain self-sufficiency.

The LKLP will be integral in its role in REVAMP IT by providing transportation to students to the 21st Century Learning Center Academy for after-school assistance, one ride a month to families for assistance in attending REVAMP IT components such as focus groups or community forums, and performing quarterly in-home visits to assess screen-time progress and develop relationships with families to promote a stronger sense of social support and potential behavior mirroring from children.

Knott County Tourism Commission

The final community partner of REVAMP IT that will increase accessibility, transportation, and increase opportunities for physical activity will be the Knott County Tourism Commission. They will play an active role for collaborating activities to promote team-based events as well as work with the Leslie, LKLP to provide rides to after-school programs, as well as facilities such as parks and gyms. Specifically, Carr Creek State Park will be the major area targeted; parents will receive a permission slip at the beginning of REVAMP IT's integration into each elementary school, and a field trip will be planned and implemented six months after program integration. Students and families will be encouraged to attend together; The Knott County Tourism Commission will work to provide several employees to assist in this field trip in leading team-based physical activity events such as relay races, and lead hikes among the various nature trails. Students will be encouraged to bring their Misfit Wareables Flash activity tracker or basic pedometers and document the number of steps that they achieved during the trip, with the incentive of small prizes awarded to all students that exceed their step goals.

Community Advisory Group

The first month of REVAMP IT development will involve the establishment of a Community Advisory Group (CAG.). This will include local community leaders, members of the Health Department, as well as representatives from school setting such as teachers, students, and medical personnel so that all perspectives of the target population are adequately represented. The CAG will act to oversee the quality of the REVAMP IT materials implemented, provide a contributory voice for the target population, and provide recommendations and feedback to the Project Director. The members planned to be included are listed in **Table 4**.

Project Management

Project Director

Jessica Cooper will serve as in conjunction with the full-time Project Director for the REVAMP IT. As the District Director for the KY River District Health Department, she oversees seven counties in Kentucky, ranging from Knott, to Wolfe. She will be the primary manager of the training, implementation, evaluation, and all other associated aspects of the program during the 3-year grant period. The program will initially be implemented in solely one middle or high school in Knott County, with quarterly reevaluations of budgetary and efficacy standards; Ms. Cooper will act as the final say for expanding the program after the project committee has met and discussed their concerns, both throughout the county, and even to other KY River District Counties on an individual basis after the grant funding period is over. The project committee will include the Project Director, Project Coordinator, Superintendent of Knott County Schools, as well as representative from each school that is currently undergoing the program. The first sixth months after implementation will be used to establish progress of the program as well as ensure that the goals for each student are reasonable and are still motivated to continue with the intervention. At the one year mark, a community forum will be conducted in the at the school auditorium to discuss strengths and weaknesses of REVAMP IT. Subsequently, Beaver Creek, Carr Creek, and Hindman Elementary will incorporate the intervention into their curriculum. To aid Ms. Cooper in the budgetary evaluation as well as keeping the program on track through means of being a direct link to the community, and monitoring grant compliance as well as expenditures, Derek Waddell, the Public Health Preparedness Coordinator for the KY River District Health Department will also be involved.

Ms. Cooper will also be responsible for conducting an annual Employee Satisfaction Survey, administered to all personnel involved with the program – this includes all teachers, LKLP volunteers, and involved KY River District Health Department employees. The purpose of the survey is to assess the quality of the work and general opinions towards the workload of the project, as well as minimize turnover rates during the grant period which may lead to a decrease in available funding and additional

training and time required. The results of the survey will be discussed during meetings of the Project Committee, and any manipulations or changes to workload, staffing, or budgetary adjustments, will be decided by Ms. Cooper at that time.

Project Coordinator

Linda Caudill, the Nutrition Services Coordinator at the KY River District Health Department will act in conjunction with the full-time project coordinator for the program and play the role in micromanaging daily activities. She will ensure that quarterly in-home visits/phone calls are being coordinated and performed, goals and objectives are being met, as well as aiding Ms. Cooper in monthly meetings with the community as well as during quarterly re-evaluations of the program. Ms. Caudill will act as the voice of the program when dealing with day-to-day issues and questions from school coordinators, other key personnel, and addressing any immediate community concerns.

Ms. Caudill will also be responsible preparing reports that are necessary for the Project Director, community meetings, and the project committee so that the program is always up to date with the latest gathered information and can be adequately assessed. She will also provide guidance to the third-party statistician in developing quarterly assessments, as well as the annual reports and final data analysis at the end of REVAMP IT.

Key Personnel

LKLP volunteers will be responsible for in-home visits to families for quarterly check-ins to receive feedback from families, as well as assess the use and adequacy of the screen-time monitors if the family has opted in for that option. If in-home visits are not possible, these facilitators will be responsible for attempting phone calls to speak to a parent or guardian, to obtain this information. As outlined in the budget, these personnel will be compensated for mileage while traveling to homes, provided that the travel is appropriately documented on forms as provided by Ms. Cooper.

Budget Justification

Total Budget: ~\$250,000/yr; \$750,000

Study Personnel

Jessica Cooper, District Director, KY River District Health Department (20% effort, years 1-3)

Ms. Cooper is a graduate of Eastern Kentucky University with a BBA in Healthcare Administration. She started working for the KY River District Health Department in 1992, and became the District Director in 1999. Due to her extensive background with the Health Department and its associated counties, Ms. Cooper is well suited to act as the Project Director for this program. She will be able to facilitate closely monitored interactions and communications between the schools in Knott County, as well as manage the implementation and evaluation of the program. Her expertise and experience will be useful in monthly meetings with the Project Committee to address issues and concerns, as well as in meetings with program educators and the respective parents or guardians of program participants. She will also play a role in budgetary management, to ensure that the grant funding is adequately distributed and the program is on track.

Derek Waddell, Public Health Preparedness Coordinator, KY River District Health Department (25% effort, years 1-3)

Mr. Waddell's position is general oversight of the program as well as aiding Ms. Cooper in budgetary management, as well as addressing any concerns from the public during the three years of program intervention. Because of his public health background, he will also be working Ms. Caudill, the Nutrition Services Coordinator, as well as the program facilitators in schools in order to optimize and develop program components that will be optimal for Knott County adolescents. Most of the background work of the program will be conducted by Mr. Waddell, including updating and maintaining additional resources related to the program such as dietary and physical exercise supplements, as well as compiling contact information for the public of program facilitators that will be distributed. Lastly, Mr. Waddell will be responsible for maintaining and documenting all of the supplies that are distributed during the

program, including all informational packets, surveys, pre and post-tests, as well as screen-time monitoring devices or applications and ensure that all materials are accounted for.

Linda Caudill, Nutrition Services Coordinator, KY River District Health Department (20% effort, years 1-3)

Ms. Caudill's role in the program will be to develop all of the education materials and to aid in providing training to program facilitators so that the program can be successfully implemented in target schools. Due to her background as Nutrition Services Coordinator, she will thrive in providing both in-person educational information as well as take-home information for program participants over physical education, healthy eating habits, consequences to obesity and health issues, as well as other decided topics. Her other primary role will be to coordinate events with local businesses as well as nearby farmer's markets if available, in order to promote traffic as well as to negotiate discounts so that families are incentivized to purchase local, fresh, and healthy alternatives to what they have previous been eating on a daily basis.

Teachers and Educators, Program Facilitators (Volunteer-basis, or career-related)

In collaboration with the Knott County Board of Education, the in-school curriculum for REVAMP IT will be developed by teachers during a summer workshop spanning 2 months, and qualify for a Professional Development opportunity. Teachers that choose not to opt for this option and participate via a volunteer basis will still be subject to all of the same requirements, however they will be provided a \$50 gift card for quarterly check-ins with the FT Program Director and disclosure of data and completed curriculum by their students. Program facilitators (LKLP volunteers) will have their primary role in conducting home visits or phone calls, as well as checking electronic or physical screen time monitors if the family has opted in for the option. These will be performed quarterly which will constitute the bulk of the work for this position.

Statistician (~\$15,000 yearly)

A third-party statistician will be hired to perform data analysis that is to be quarterly upon data collection, as well as yearly at the culmination of REVAMP IT in each respective elementary school to

assess the feasibility and performance of the program, as well as to predict early results if possible. They will also be responsible for analyzing key components such as socio-demographic information, household education, income, risk behaviors, and other environmental components to assess for possible significant differences within the study population, as well as statewide comparisons if they program is deemed successful.

In-State Travel

LKLP volunteers will spend the majority of their time performing in-home visits, as well as doing check-ups via phone or email to the families of participating adolescents. Mileage reimbursement for documented trips will be at \$0.25/mile, with an estimated participation rate of roughly 200 students the first year of the program. The area of Knott County is relatively wide at 353 square miles, in comparison to Fayette County at 286 square miles. It is currently unknown the range of mileage that will need to be traveled to perform home visits, however, a first year mileage budget of \$1,500 accounts for 6,000 traveled miles, which accounts for 30 miles a student if 200 students enroll. The enrollment number will be closely tracked to ensure that travel expenses are not under-budgeted; Currently yearly expenses are totaling close to \$50,000 under-budget for the first year, and roughly \$25,000-\$35,000 subsequently, so this number will be able to be adjusted comfortably.

Supplies

\$10,000 year one, increases exponentially during year two and three as more participants and schools are expected to participate in the program pending its feasibility and success. Supplies that will be required include physical screen time monitoring devices if needed, or else the Health Department will reimburse families to purchase an approve smartphone application to save on costs and convenience. Other supplies include Misfit Wearables Activity Trackers, printers, printer cartridges, envelopes, stamps, printer paper, pens, notepads, and various office supplies required for day-to-day activities.

References

1. Childhood Obesity Facts. <https://www.cdc.gov/obesity/data/childhood.html>. Published April 10, 2017. Accessed April 19, 2017.
2. Physical Activity. Obesity Prevention Source. <https://www.hsph.harvard.edu/obesity-prevention-source/obesity-causes/physical-activity-and-obesity/>. Published April 12, 2016. Accessed April 19, 2017.
3. Overweight and Obesity Statistics. National Institutes of Health. <https://www.niddk.nih.gov/health-information/health-statistics/Pages/overweight-obesity-statistics.aspx>. Accessed April 19, 2017.
4. Overweight and Obesity. <https://www.cdc.gov/obesity/stateprograms/fundedstates/pdf/kentucky-state-profile.pdf>. Published September 12, 2012. Accessed April 19, 2017.
5. Kentucky Health Facts: Data By Location: Knott County. Kentucky Health Facts. <http://www.kentuckyhealthfacts.org/data/location/show.aspx?cat=1%2C2%2C3&loc=60>. Accessed April 19, 2017.
6. UK Cooperative Extension Service. UK Cooperative Extension Service. http://www2.ca.uky.edu/hes/internal/FSNE_FAQ/50_reduced_Lunch_11/Knott.pdf. Published October 2010. Accessed April 19, 2017.
7. Health Rankings. County Health Rankings & Roadmaps. <http://www.countyhealthrankings.org/app/kentucky/2016/rankings/knott/county/outcomes/overall/snapshot>. Accessed April 19, 2017.
8. Childhood Obesity Causes & Consequences. <https://www.cdc.gov/obesity/childhood/causes.html>. Published December 15, 2016. Accessed April 19, 2017.
9. UK Cooperative Extension Service. UK Cooperative Extension Service. https://extension.ca.uky.edu/sites/extension.ca.uky.edu/files/knott_report_to_the_people_2015.pdf. Published November 2015. Accessed April 19, 2017.
10. Hosier AF, Traywick LVS, Yelland E. Keys to Embracing Aging. Keys to Embracing Aging 101. <https://www.uaex.edu/publications/PDF/FCS778.pdf>. Accessed April 19, 2017.
11. Defining Childhood Obesity. Centers for Disease Control and Prevention. <https://www.cdc.gov/obesity/childhood/defining.html>. Published June 19, 2015. Accessed April 19, 2017.
12. KIDS COUNT data center: A project of the Annie E. Casey Foundation. KIDS COUNT data center: A project of the Annie E. Casey Foundation. <http://datacenter.kidscount.org/>. Accessed April 19, 2017.
13. Profile: Emmalena, Kentucky (KY). Public School Review. <http://www.publicschoolreview.com/emmalena-elementary-school-profile>. Accessed April 19, 2017.
14. Reduce Screen Time. National Institutes of Health. <https://www.nhlbi.nih.gov/health/educational/wecan/reduce-screen-time/>. Accessed April 19, 2017.
15. Bucksch J, Inchley J, Hamrik Z, Finne E, Kolip P. Trends in television time, non-gaming PC use and moderate-to-vigorous physical activity among German adolescents 2002–2010. *BMC Public Health*. 2014;14(1). doi:10.1186/1471-2458-14-351.
16. Iannotti RJ, Janssen I, Haug E, Kololo H, Annaheim B, Borraccino A. Interrelationships of adolescent physical activity, screen-based sedentary behaviour, and social and psychological health. *International Journal of Public Health*. 2009;54(S2):191-198. doi:10.1007/s00038-009-5410-z.
17. 20 2010 J. Generation M2: Media in the Lives of 8- to 18-Year-Olds. The Henry J. Kaiser Family Foundation. <http://kff.org/other/report/generation-m2-media-in-the-lives-of-8-to-18-year-olds/>. Published November 12, 2015. Accessed April 19, 2017.

18. Reducing Children's Recreational Sedentary Screen Time - Recommendation of the Community Preventive Services Task Force.
<https://www.thecommunityguide.org/sites/default/files/publications/obesity-AJPM-rec-behavioral.pdf>. Published March 2016. Accessed April 19, 2017.
19. LKLP Community Action Council, Inc. <http://www.lklp.org/>. Accessed April 19, 2017.
20. 2014 State Indicator Report on Physical Activity.
https://www.cdc.gov/physicalactivity/downloads/pa_state_indicator_report_2014.pdf. Accessed April 25, 2017.

Table 2. GANTT Chart - Plan of Action

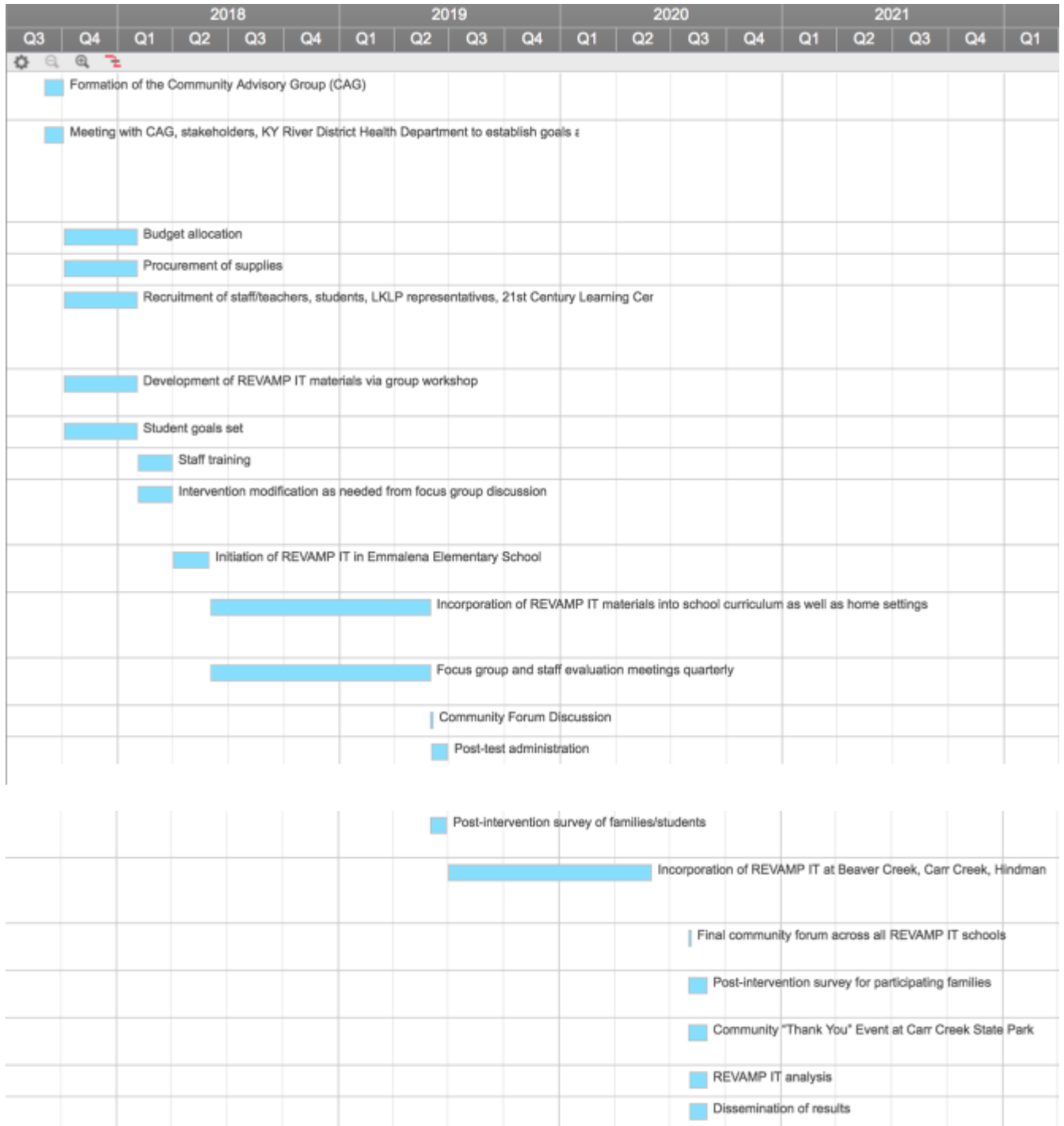


Table 3. Pre-test/Post-test Template

1. What is the daily recommendation for physical activity in children/adolescents (< 18 years old)?
 - a. 25 minutes
 - b. 30 minutes
 - c. 45 minutes
 - d. 60 minutes
2. Physical activity includes aerobic activities such as dancing, walking, running, soccer, and basketball
 - a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
3. On average, how much time do you spend watching TV, playing video games, or on the computer
 - a. Less than 1 hour
 - b. Less than 3 hours
 - c. Less than 5 hours
 - d. More than 5 hours
4. Which item has the least number of calories?
 - a. 8 ounces of skim milk
 - b. 1 McDonalds Big Mac
 - c. 1 serving of macaroni and cheese
 - d. 1 fried chicken sandwich
5. How many calories do 25 grams of protein equal?
 - a. 50 calories
 - b. 60 calories
 - c. 75 calories
 - d. 100 calories
6. On average, how much time do you spend a week on physical activity?
 - a. 1 hour or less
 - b. 3 hours or less
 - c. 5 hours or less
 - d. More than 5 hours
7. Which of the following qualifies as one serving of protein?
 - a. 2-3 ounces of cooked lean meat
 - b. 1 tablespoon of peanut butter
 - c. 1 cup of cooked beans
 - d. 3 handfuls of nuts
8. What object closely resembles one serving of leafy vegetables?
 - a. Grapefruit
 - b. Baseball
 - c. Bowling ball
 - d. Hockey puck

9. I spend most of my free time watching television, playing video games, or on the computer
 - a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
10. On average, how many times a week do you eat out/fast food?
 - a. 2 times or less
 - b. 4 times or less
 - c. 6 times or less
 - d. More than 7 times
11. My parents/guardian exercises on a regular basis
 - a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree
12. My parents/guardian would be happy to help me pack a lunch to bring to school
 - a. Strongly agree
 - b. Agree
 - c. Disagree
 - d. Strongly disagree

Table 4. Community Advisory Group for REVAMP IT

Advisory Group Member	Organization Description	Contribution
KY River District Health Department Epidemiologist	Primary organization facilitating the integration of REVAMP IT	Provide input on overall participation rates and health disparities present in target population
Knott County Health Education Director	Branch of KY River District Health Department, direct involvement in Knott County Public Health and wellness directives/events	Familiarity with target population and past/present interventions and health directives
Registered Dietitian responsible for Knott County Schools	Employee	Provide guidance to students who require additional resources
Knott County Curriculum Supervisor	Collaborative practice with Knott County Board of Education to ensure compliance with curriculum and development standards	Provide input over summer workshop curriculum development Collaboration with Knott County Board of Education to ensure Professional Development standards are being met
LKLP Executive Director	Non-profit state-funded organization assisting Kentucky residents achieve and maintain self-sufficiency	Provide input on LKLP participation and utilization of volunteers for direct family contact
LKLP Volunteer	Volunteer	Provide volunteer feedback towards home visits and transportation of families/students
Co-Director of 21 st Century Learning Center Academy	Knott County’s established after-school program dedicated to academic enrichment, tutoring, and physical activity	Provide input on participation and feasibility of after-school education and physical activity opportunities, address possible barriers

Student Council President at each respective Knott County Elementary School under REVAMP IT incorporation	Perceived student leader and representative voice	Provide valuable student feedback over REVAMP IT materials, assessment of progress of peers and overall interest
Volunteer teacher representative from each respective Elementary School	Educator	Provide input on curriculum integration and progress from students

Project Goal Statement: The sociological approach-based intervention to target behavioral, attitudinal, and biometric goals will be delivered by the KY River District Health Department to 75% of the adolescent population in Knott County through established school programs in elementary schools. Interventions will include screen-time monitors in the household, pedometer tracking of physical activity, and various aspects of community involved and rewards within the school system.

OUTCOME #1: Program staff are adequately trained to properly and effectively deliver program interventions in an elementary school setting.

OUTCOME #1 WORKPLAN

Activity	Inputs	Time Frame	Responsible Person	Anticipated Outcome
<i>Knott County elementary school teams develop the curriculum for the in-school program via a professional development summer workshop: KY River District Health Department ensures appropriateness for age/culture, as well as medical accuracy</i>	<ul style="list-style-type: none"> ▪ Knott County Board of Education ▪ Teachers ▪ KY River District Health Department 	01/17-6/17	FT Program Director KY River District Health Department Teachers	Curriculum development
<i>Recruitment of school faculty/staff to deliver the intervention</i>	<ul style="list-style-type: none"> ▪ District Director ▪ Knott County Superintendent 	6/17-12/17	Kimberly King Michelle Sandlin KY River District Health Department	Overview of the program Staff at first target elementary schools trained
<i>Program and financial evaluation including goals to stay on track</i>	<ul style="list-style-type: none"> ▪ Finance Officer ▪ District Director 	8/17-Indefinitely	FT Program Director	Budgetary evaluation and cost-effectiveness program

OUTCOME #2: Children and parents are more knowledgeable about nutrition, physical activity, and/or better utilization of sedentary time

OUTCOME #2 WORKPLAN

Activity	Inputs	Time Frame	Responsible Person	Anticipated Outcome
<i>Order pedometers/screen time trackers</i>	<ul style="list-style-type: none"> ▪ <i>Allocated Funds</i> ▪ <i>District Director</i> 	<i>10/17 – 12/18</i>	<i>Karen Cooper</i>	<i>Roughly 1,000 pedometers/screen time trackers obtained in initial phase of the program</i>
<i>Develop and print attractive copies of educational materials</i>	<ul style="list-style-type: none"> ▪ <i>Nutrition Services Director</i> ▪ <i>Health Education Director</i> ▪ <i>Paper, money for printing</i> 	<i>6/17 – 6/18</i>	<i>Alice Caudill</i>	<i>1,000 copies printed</i>
<i>Creation of recipe guide</i>	<ul style="list-style-type: none"> ▪ <i>Local volunteers</i> ▪ <i>Health Education Director</i> ▪ <i>Nutrition Services Coordinator</i> 	<i>5/17-12/17</i>	<i>Alice Caudill</i>	<i>1,000 copies of recipe guides and coupons printed</i>
<i>Develop and conduct telephone survey of parents/conduct in-home visits</i>	<ul style="list-style-type: none"> ▪ <i>LKLP Coordinator</i> 	<i>Quarterly</i>	<i>LKLP Volunteers</i>	<i>25% of parents surveyed</i>

OUTCOME #3: Effective dissemination to inform key end users and stakeholders over critical aspects of the program, as well as utilize received feedback

OUTCOME #3 WORKPLAN

Activity	Inputs	Time Frame	Responsible Person	Anticipated Outcome
<i>Distribute program curriculum, research, and written materials to end users via handouts, in-person</i>	<ul style="list-style-type: none"> ▪ <i>Allocated Funds</i> ▪ <i>District Director</i> 	<i>1/17-6/17</i>	<i>FT Program Director Karen Cooper</i>	<i>Awareness and interest generated into the program</i>
<i>Identify households and families with school-aged children</i>	<ul style="list-style-type: none"> ▪ <i>Knott County Board of Education</i> 	<i>1/17-6/17</i>	<i>Kimberly King</i>	<i>List of families, including names and addresses</i>
<i>Reporting of inquiries from the Kentucky River District Health Department</i>	<ul style="list-style-type: none"> ▪ <i>District Director</i> 	<i>1/17-6/17</i>	<i>FT Program Director Karen Cooper</i>	<i>Adjustments to program curriculum/printed materials</i>

Inputs	Outputs		Outcomes
	Activities	Participation	Short/Medium
<p>Health Department led integration of the program into Knott County Schools</p> <p>Guidance and approval from superintendent</p> <p>LKLP support with data collection, monthly rides</p> <p>Data on demographics, physical activity, and obesity conditions obtained from pre-test or Board of Education</p> <p>Allocation of available funding/resources for participant compensation</p> <p>Teachers, parents/caregivers willing to facilitate change</p> <p>Recruitment of teachers/community individuals to deliver interventions</p> <p>Advertisement of focus groups to families and promoting participation</p>	<p>Training and utilization of school teachers for guidance and support</p> <p>Training of dedicated counselors devoted to follow-up management</p> <p>Curriculum integration done by established teachers</p> <p>Parent/caregiver focus groups to ensure supportive attitudes, encouragement, potential mirroring of actives</p> <p>Constant monitoring, data upkeep, and individual tailoring of interventions</p> <p>Continual upkeep of program components and data collection</p>	<p>Elementary school students in Knott County that are enrolled in participating schools</p> <p>REVAMP IT utilizes an opt-out option, so students are enrolled unless permission revoked</p> <p>Opportunity for small prizes, fitness trackers, will promote interest and friendly competition in children</p>	<p>Increased physical activity (measured primarily by pedometer) of 10% or greater</p> <p>Increased productive utilization of sedentary time</p> <p>Decreased TV time of 10% or greater</p> <p>Decreased electronic usage, video games, computers</p> <p>Caregiver/parent support and encouragement</p> <p>Increased knowledge of healthy habits and means of exercise</p> <p>Subjective improvement behavioral attitudes and overall knowledge on post-test versus pre-test</p>