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Using the Whole School, Whole Child, Whole Community Approach to Improve an Urban Early Learning Center Students' Social, Emotional, and Physical Health and Wellness

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Abstract

Background: Integrating school-based health education and models of healthy lifestyles in early childhood provides a foundation for lifelong health learning. Many chronic may be prevented or mitigated through early childhood health education. Early learning centers (ELCs) may be a perfect setting to enable young children to achieve their full potential.
Problem: In Boston, Massachusetts, there are differences in health experience across population groups. Children of color and lower socioeconomic challenges experience higher rates of chronic conditions.
Available Knowledge: Search of literature showed that school-based healthy lifestyle interventions improve healthy behaviors and can be taught to children as young as preschool.
Purpose: To improve physical, mental, and social health and well-being in an ELC in Boston, by implementing the CDC *Whole School, Whole Child, Whole Community* (WSCC) integrated approach to health.
Context: The setting was an ELC in Boston.
Interventions: Implemented the WSCC model by applying the Plan-Do-Study-Act cycle.
Evaluation: Implementation was assessed using informal interviews, meetings, a needs assessment tool, and a team satisfaction survey.
Results: Four interdisciplinary members evaluated the project. All agreed WSCC approach was beneficial, and the team worked well together. All feedback noted that it would have been better without COVID-19.
Conclusion: WSCC was be beneficial, and was implemented without much effort. Assessing and reassessing needs and opportunities allows for adaptation, even during times of extreme stress and unpredictability. An interdisciplinary approach to integrating health and wellness in an ELC works and could be used as a model for other educational settings.

Key Words: Whole School, Whole Child, Whole Community; Early Learning Center; Preschool; Health Promotion; School Health Education

Using the *Whole School, Whole Child, Whole Community* Approach to Improve an Urban Early Learning Center Students' Social, Emotional, and Physical Health and Wellness

Introduction

There is increasing recognition that integrating school-based health education and models of healthy lifestyles in early and middle childhood provides a foundation for lifelong health learning (Office of Disease Prevention and Health Promotion [ODPHP], n.d.). Childhood is a critical period of growth and development, and a child's experiences can have long-term impacts on their physical and mental health (ODPHP, n.d.; WHO, 2021). Learning healthy behaviors and developing health literacy and numeracy in childhood can help prevent chronic diseases in children and can improve their personal long-term health as well making a lasting impact on generations that follow (WHO, 2013). Evidence suggests that many chronic diseases of childhood such as obesity, type II diabetes, and asthma may be prevented or mitigated through early childhood health education (CDC, 2019; Sweet, 2011). Early learning centers (ELCs) are school based learning environments that serve children in the preschool years and are designed to improve later school performance (HOC, 2021). Early learning centers may be a perfect setting for promoting foundational physical health and wellness in order to enable young children to achieve their full developmental potential. (CDC, 2019; Pulimeno et al., 2020; WHO, 2021)

With ELC-based integration in mind, what follows is a description of the quality improvement (QI) project that was carried out with the aim of implementing a *Whole School, Whole Child, Whole Community* (WSCC) model into an ELC in Boston, Massachusetts (MA). Following the five steps of Rogers' diffusion of innovations theory (DOI), health education and models of healthy lifestyles were integrated into an early childhood education program. This

program intended to have significant effects on the overall health of students attending the ELC and the community.

Problem Description

Chronic diseases are the leading causes of death in the United States (U.S.) (NCCDPHP, 2021). Many of these diseases such as obesity, type II diabetes, asthma, and cardiovascular diseases can be attenuated with school-based health education (CDC, 2019). According to the Organization for Economic Co-operation and Development (OECD, n.d.), the U.S. has a chronic disease burden two times higher than the rest of the developed world (Tikkanen & Abrams, 2019). People of color and lower socioeconomic status (SES) are disproportionately affected by chronic diseases (Baciu et al., 2017). Despite its wealth, the U.S. compares poorly to other industrialized countries in terms of disparities of wealth and the provision of equitable access to quality healthcare and education. (Baciu et al., 2017). People with lower SES, lower educational levels, and members of ethnic and racial minorities are more likely to develop chronic health problems, be chronically stressed, and experience obstacles for health and educational achievement (Braveman et al., 2010; Knopf et al., 2016). Of particular concern over the past two decades, and relevant to the project that was implemented, there has been a sharp increase in childhood conditions such as obesity, hypertension, type II diabetes, and asthma (HOB, 2013). Recent attention has focused on the foundational prevention of adverse risk factors and has linked the health behaviors of parents to the health of children (Muchira, 2021).

Local Problem

Massachusetts (MA), which proudly boasts having the best ranked public schools in the U.S., has glaring and persistent health disparities among its students (Bonner, 2020). Results from the Boston Survey of Children's Health (BSCH) show the overall important indicators for children's physical and mental health are lacking in certain neighborhoods and that there are stark differences in health experience across population groups (HOB, 2013). Black and Latinx children in Boston, for example, continue to experience higher rates of asthma, obesity, type II diabetes, and a host of other conditions compared with White children (HOB, 2013). Furthermore, nearly one in three (31%) Boston children live in poverty (HOB, 2013).

The World Health Organization (WHO) and Center for Disease Control (CDC) have identified important indicators that should be assessed when evaluating communities for health inequities. These indicators, referred to as social determinants of health (SDoH), have been identified as key factors that shape the conditions of individuals' lives within a community and are strongly associated with the development of chronic disease (HP2030, n.d.). Social determinants of health involve every domain of people's lives and take into account where people are born, live, learn, work, play, worship, age, and all of the forces and systems shaping children's experiences and determining health (NCCDPHP, 2021; WHO, 2021).

To prevent chronic diseases, children need to have opportunities to experience healthy lifestyles that include, among other things, access to adequate physical exercise and healthy nutrition, effective models of how to manage stress, and limited exposure to chronic stressors (CDC, 2019). Unfortunately, not all communities in Boston have conditions that are supportive of these needs. Rather, children in some communities are disproportionately exposed to a range of environmental stressors and factors that influence more sedentary behaviors, poor nutrition,

and other unhealthy lifestyle patterns (FRAC, 2017). The evidence is clear that the communities where children live and grow, including their home, neighborhood, and school, has a profound influence on their health and this influence can be either positive or negative (WHO, 2021; CDC, 2021; HP2030, n.d.).

Creating a learning environment where children can experience and learn about health and well-being can help launch them into lifelong relationships to healthy lifestyles. Consequently, the early learning centers where the project took place have three Boston locations that can create a healthy milieu for their local communities in Boston. They aim to be socio-economically, racially, and culturally diverse and most of their students receive child-care subsidies from the government and eventually attend Boston Public Schools which made it an ideal location for the project (ellismemorial.org, 2021).

Available Knowledge

A review of the literature was conducted to identify the strategies that have been shown to improve elementary school students' social, emotional, and physical health and wellness. What follows is a discussion of the methods used to guide this review. A Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) search examined effective strategies that have been utilized to integrate health education and healthy lifestyles in early childhood students. The databases searched included the following: Education Resource Information Center (ERIC); Cumulative Index to Nursing and Allied Health Literature (CINAHL); and Public/Publisher MEDLINE, NLM journal articles database (PUBMED). The key terms used were (k-6 or elementary or primary) AND "health promotion" AND (strategies or methods or techniques or interventions) AND "school health education."

The reference lists included randomized control trials, scholarly journals, and English language between 2006 and 2021. The initial search resulted in 191 articles, which were then hand searched and pared down to seven articles that came closest to aligning with the aim of improving physical, mental, and social health and wellness in young children.

These selected articles included five U.S. and two European quantitative studies as well as two expert opinion pieces. The expert opinion pieces were evaluated for strength and quality using the Johns Hopkins Nursing evidence-based practice research appraisal tool (Dang, 2017). The *Whole School, Whole Child, Whole Community* (WSCC) conceptual model was used to synthesize and organize the results according to how many of the WSCC 10 components were addressed in each study (Appendix A).

Five of the articles showed that multidimensional and comprehensive school-based healthy lifestyle interventions improve healthy behaviors in elementary school-age children (Ling et al., 2014; Piana et al., 2017; Northrup et al., 2020; Rosemond et al., 2015; Zarembia Morgan et al., 2014). Evidence suggests that modifiable health behaviors of children through education, skill building, and mentoring results in sustainable positive dietary behavior change and self-efficacy among elementary school children in the U.S. (Northrup et al., 2020; Rosemond et al., 2015; Zarembia Morgan et al., 2014). Several studies supported a multidimensional approach involving school districts, caregivers, gym teachers, school nurses, teachers, and community partnerships to address both health risks and health promotion behaviors (Belansky et al, 2016; Piana et al., 2017; Northrop, et al., 2020; Rosemond et al., 2015; Zarembia Morgan et al., 2014). Evidence shows that children as young as preschool could learn healthy behaviors (Gillander Gådin et al., 2012; Northrop, et al., 2020).

Finally, global, national, and local models and frameworks were reviewed to establish an understanding of the complexity of the problem as well as to select a framework for implementing an intervention. Two multidimensional models aligned well with the purpose of this project. From a global perspective, the Global School Health Initiative (GSHI), developed by the WHO, provided a worldwide model aimed at increasing the number of schools with a healthy setting for living, learning, and working (WHO, 2021). In the U.S., the Centers for Disease Control and Prevention (CDC) uses the Whole School, Whole Child, Whole Community (WSCC) framework for addressing health in schools. The WSCC model is student-centered and emphasizes the role of the community in supporting the school, the connections between health and academic achievement, and the importance of evidence-based school policies and practices (CDC, 2021). Although the GSHI and WSCC models are similar, the WSCC aligns more specifically with needs and programs of the U.S

Rationale

The *Whole School, Whole Child, Whole Community* (WSCC) was used to guide the intervention implemented in this improvement project. The WSCC is a national model developed by the Centers for Disease Control and Prevention (CDC) and the Association for Supervision and Curriculum Development (ASCD), along with key leaders from public health, school health,

and education. The model sets the standard and creates a framework and understanding for what a whole child education should be.

This approach assumes that in order for education to be comprehensive and sustainable, programs should be child-centered and built upon the five Whole Child Tenets. These tenets affirm that each child will be healthy, safe, engaged, supported, and challenged, and they serve as the foundation for whole child development in an early learning context (Figure 1: Coordination Ring) (CDC, 2019).

Figure 1. Coordination Ring (CDC, WSCC, 2019)

The WSCC model is designed to be tailored to the unique needs of the school children. The School Improvement Tool Needs Assessment Survey (SITool), a tool created by the Association for Supervision and Curriculum Development (ASCD), was designed to help customize the WSCC model by providing a comprehensive snapshot of how school stakeholders perceive how their school fulfills the ASCD Whole Child tenets (healthy, safe, engaged, supported, and challenged) (ASCD, 2021). Results of the survey also relate well with the 10 School Health Components and policies, processes, and practices that improve learning and improve health set forth in the WSCC model.

The WSCC model also consists of 10 School Health components which supports health, education, and community and family partnerships to promote healthier nutrition, physical activity, improve management of chronic conditions, instill life-long healthy habits and health literacy, and improve services and links to clinical and community resources.

The components can be further broken down into following domains: (a) physical education and physical activity; (b) nutrition environment and services; (c) health education; (d) social and emotional school climate; (e) physical environment; (f) health services; (g) counseling, psychological and social services; (h) employee wellness; (i) community involvement; (j) and family engagement (Figure 1: Coordination Ring) (CDC, 2020). These components served as the guiding framework for the project by providing foundational health principles centering on health equity and designs for sustainability.

The Diffusion of Innovation (DOI) Theory (Rogers, 2002) has been shown to be helpful in implementing wellness policies in schools and was used as a conceptual model to facilitate and accelerate adoption of WSCC (Harriger, 2014). Rogers' Theory provides a multifaceted perspective about social change in a social system, highlighting how new ideas are processed and communication is enhanced within a social system over time. The innovation-decision process involves five steps: 1. knowledge, 2. persuasion, 3. decision, 4. implementation, and 5. confirmation. The DOI model emphasizes that when different stakeholders view themselves as part of the same system, optimization of the larger system can occur and be used to turn ideas into action and connect action into learning (Langley et al., 2009). The DOI can also be used to speed up innovations by persuading champions to promote preventive innovations, establish support, and activate networks (Rogers, 2002). The theory is also helpful in elucidating ways to sustain the innovation once it is adopted.

Specific Aims

The purpose of this QI project was to ensure that each child is healthy, safe, engaged, supported, and challenged in a Boston early learning center. The overarching aim was to implement the WSCC model into an early learning center.

The specific aims of the project were to:

1. Establish leadership buy-in and support.
2. Map the school's health related assets and gaps using the SITool.
3. Create a working group with the staff to develop and deploy WSCC Health Services Strategies.
4. Conduct a post-implementation evaluation of the health services strategy employed, and track ongoing progress, trends, and ongoing needs.
5. Evaluate staff satisfaction with the WSCC initiative and any additional strategies implemented.

The specific aims were to be met within six months of implementation. Although these specific aims follow a stepwise process, they are not intended to be strictly linear or static. Rather, they were intended to map a dynamic process that requires routine assessment and analysis of the steps taken and redesigning of the multidimensional systems. After successful implementation of one full cycle of the project with a small component of the ELC program, the PDSA cycle could continue with the whole ELC programs, entire school district, and beyond.

Methods

The guiding methodology for planning, development, implementation, and evaluation was the Plan-Do-Study-Act (PDSA) cycle. The PDSA cycle is an iterative four-step method used to turn ideas into action and connect action to learning for continuous improvement of processes (Figure 4) (Langley et al., 2009). In this project, the PDSA cycle was used to evaluate if the change represented an improvement. This simple framework was intended to lead to an accelerated, tested improvement (IHI, 2005). What follows is a description of how the steps of

the PDSA cycle were applied to this project. How the specific steps applied will be discussed further in the section on interventions below.

Context

The project was carried out in an ELC, located in the South End, Roxbury, and Jamaica Plain Neighborhoods of Boston (ellismemorial.org, 2021). The first step involved a consideration of the many dynamic factors that are a part of the contextual make-up specific to the ELC project. As seen in Appendix B, the ELC is in the center of the map with the child at its nucleus. Surrounding the ELC and child are internal and external forces that impact the ELC/child. Internal forces include leadership/administration, educators, curriculum, social workers, nutrition, exercise, and after-school programs. The external forces include family, home, community, policy, donors, partners, boards of directors, and trustees. Each of these forces highlight potential challenges and opportunities for integrating health education and healthy lifestyles.

The Early Learning Center is accredited by the National Association for the Education of Young Children. It is a nonprofit organization that has funding from the Department of Early Education and Care, the Department of Children and Families, and Boston Public Schools (BPS). It is also financially supported by private donors, as well as families who pay privately. The ELC engages more than 200 children per year in full-time early education and year-round school-age programming. Sixty-five percent receive government child-care subsidies, and 80% are people of color (ellismemorial.org, 2021).

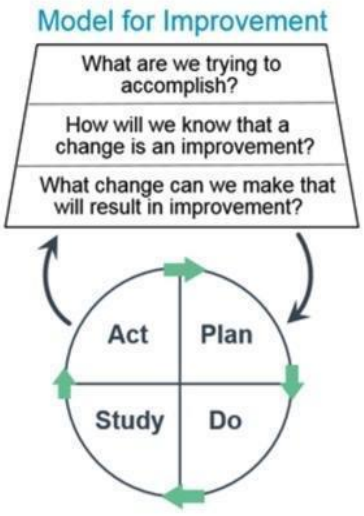
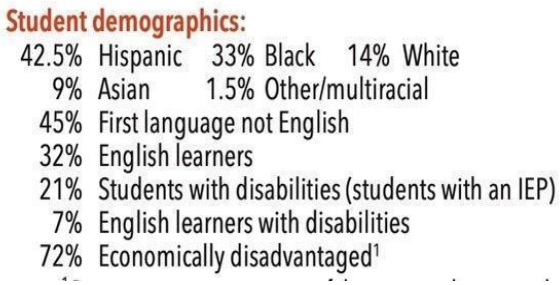


FIGURE 4. Plan-Do-Study-Act (PDSA) Cycle. (IHI, 2015)

The ELC provides day programs for children ages two months-five years as well as out of school time opportunities for children ages five-12, and their mission is to “help all children develop the social, emotional, and academic skills they need to be successful in school and in life” (ellismemorial.org, 2021). An interview conducted with the Vice President of Advancement, Community and Equity and the Vice President of Programs revealed that most of the children who attend the ELC enroll in Boston Public Schools.

Although no specific data on the demographics of the ELC were available at the time of implementation, the students were Boston residents and therefore assumptions about the students' health and living conditions were drawn from the Health of Boston Report as well as BPS data. According to the Massachusetts Department of Education (DOE), the 2017 students registered for pre-kindergarten through 12th grade in BPS were predominantly Hispanic and Black, 32% are English learners, and most were socioeconomically disadvantaged (Figure 2) (DOE. 2017).



Additionally, BPS students were struggling academically. Despite BPS making great strides in accelerating student achievement, students were still underachieving in every area of the Massachusetts Comprehensive Assessment System (MCAS) (DOE, 2017). Students attending BPS face many challenges on a daily basis that can affect learning and social development. As a result of these demographics and challenges, the mission and model of the ELC program was an excellent setting for the integration of a program such as WSCC that is committed to a wholistic approach to children and their families.

This project was based on the premise that there is a direct correlation between children's underachievement and their health. To investigate this, a cause-and-effect analysis was done to examine the number of potential factors associated with suboptimal health in children similar to those of the students attending the ELC where the intervention took place (Appendix C). Children who face health and socioeconomic challenges enter schools with complex needs that can impede overall academic and social success. These barriers include genetics, housing insecurity, poor nutrition, non-English speaking caregivers, and family stressors such as interaction with the criminal justice systems, and more. The WSCC model embraces a wholistic biopsychosocial approach that acknowledges the interconnectedness of the child in relation to their home, school, and community. Contextual elements of the environment illustrated in Appendix B demonstrate how the school/child is interconnected with community, home, leadership, administration, academic teams, and curriculum. Therefore, the WSCC model appears to be an excellent fit for guiding complex interventions for such a dynamic and multidimensional focus.

A force field analysis was conducted to identify current and potential driving and restraining forces that could impact the success of implementing WSCC (Appendix D). It is frequently the case that many of the forces that delay a project may also help to propel it forward. For example, the COVID-19 pandemic created a large disruption and delay in services, in turn creating significant stress for parents, teachers, students, and the whole community. Therefore, it was an extremely difficult time to initiate the WSCC model and integrate health into the curriculum. However, the COVID-19 pandemic also presented a potential opportunity for children because it highlighted the deep disparities experienced by students of color and those experiencing socioeconomic challenges. The driving force in this situation as it turned out was

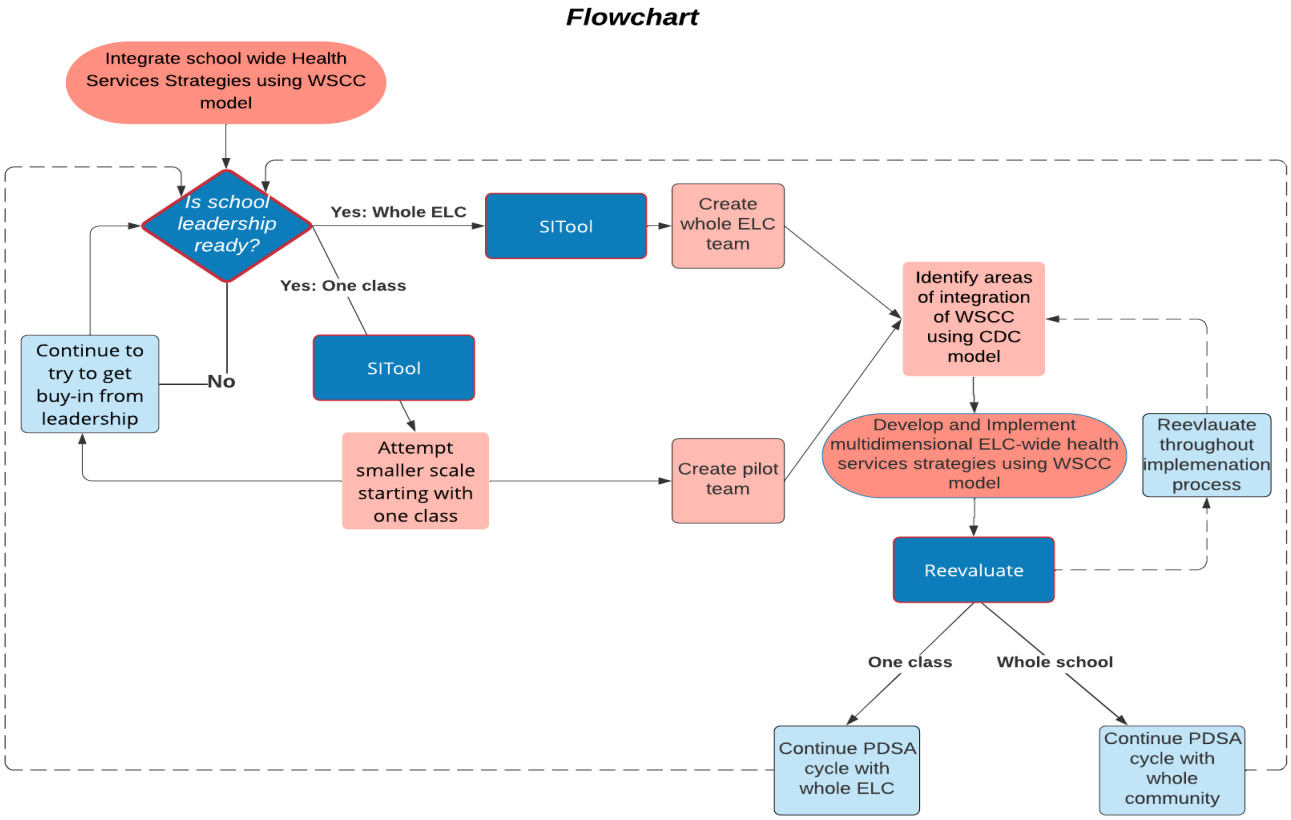
that there was the political will to address these disparities at the state and national level (DOE, 2021). Therefore, paradoxically, it was also an optimal time to implement the WSCC quality improvement project.

The restraining forces identified included staff and parent fatigue and the fact that younger children need a lot of care. The driving factors, such as, the willingness and support of the staff to promote healthy schools, the ELC's desire to be a beacon to other schools, the state and national recognition and support of programs such as WSCC, and the political will to offer ELCs to every family in the U.S, helps to propel the project forward. On balance, the driving forces appeared stronger and what could be gained seemed much more significant than what might be lost by not proceeding with the project.

Intervention

The intervention began with careful planning. The WSCC model was initially implemented as outlined in Figure 3 (larger scale in Appendix E). Using the Plan-Do-Study-Act (PDSA) cycle, the *first step (Plan)* was to establish leadership buy-in (Rooney, 2015).

The flowchart of the intervention process identified three possible scenarios regarding leadership: 1. leadership is not ready to implement the intervention; 2. leadership is ready to implement the intervention with one class; or 3. leadership is ready to implement the intervention with the whole school.



According to the flowchart, if leadership is supportive, it may be due to temporary restraining forces, such as those caused by COVID-19. In this case, leadership may be supportive when school returns to some form of normalcy. Therefore, reassessing the readiness of leadership could be done when those temporary issues resolve. Another restraining force may have been due to lack of knowledge about the WSCC model. In this instance, informing leadership about the WSCC model may help in eventually obtaining their buy-in.

After establishing leadership buy-in, the next step in the PDSA cycle *(Do)* was to have the entire staff at the ELC take the SITool survey. The SITool is a 20-minute survey based on the WSCC model. The SITool gathers staff perceptions of the five tenets of a whole child approach (healthy, safe, engaged, supported, and challenged) and scores for each School Health Component (physical education and physical activity; nutrition environment and services; health education; social and emotional school climate; physical environment; health services; counseling, psychological and social services; employee wellness; community involvement; and family engagement) and one area of Policy, Process, and Practice that ensures a whole school approach. Having the entire staff take the survey ensures that the point of view of all employees are heard.

The results from the SITool are meant to be used as a guide to implement WSCC evidence-based School Health Services Strategies provided by the CDC (CDC, 2019). Table 1 provides examples of strategies for implementation that align with the 10 WSCC components (CDC, 2019). Depending on the assets and gaps existing at the school, specific strategies in one or more categories are identified and implemented in the whole ELC program or pilot classroom program.

Table 1: School Health Services Integrated Across the WSCC Framework

WSCC Component	School Health Services Strategies	Ideas for implementation
Health Services	-Improve service to children with acute and chronic health conditions. -Educate students, caregivers and staff about chronic conditions.	Provide training to staff, and students/caregivers on resources that support students with chronic health conditions.
Nutrition	-Help manage the nutritional needs of students with chronic health conditions, including food allergies and diabetes. -Refer students to community-based health care providers and healthy eating services.	-Use colorful posters to remind students to make good food choices (available from public health agencies and USDA). -Participate in a farm-to-school program. -Partner with a collective school garden, cooking program, or fun taste test activities.
Physical Activity	-Encourage all children to participate in physical activity, regardless of ability.	-Use a SMART board to encourage instant activity -Add physical activity breaks. -Ensure access to free drinking water.
Health Education	-Make sure that students get health education that includes information on common chronic health conditions. -Use CDC's Health Education Curriculum Analysis Tool to help improve the delivery of health education.	-Fill a box with items to promote physical activity. -Assign drawing projects with health topics. -Display their artwork around the classroom; and, after a month, send it home for display in the family home.
Community Involvement	-Involve Ellis's partners: Boston Community Pediatrics, Neighborhood Villages and other organizations in school health initiatives. -Connect with out-of-school programs about access to health services and students with chronic health conditions.	-Ask volunteers to participate in lessons to make them more stimulating and invigorating. -Recruit parents and other family members via online newsletters and emails, and check with senior centers and community organizations.
Family Engagement	-Give parents opportunities to learn about chronic health conditions and school health services. -Encourage families to participate in activities that promote healthy behaviors.	Create family fitness nights, healthy cooking nights or other fun activities.
Employee Wellness	-Create a healthy work environment for staff. -Encourage school staff to model healthy behaviors.	-Create a relaxation area. -Engage staff on ideas of healthy behaviors. -Organize employee wellness programs. -Keep fitness equipment in the staff lounge.
Physical Environment	Provide a safe physical environment, both outside and inside school buildings	-Avoid sedentary work habits -Find innovative ways to move about the office, classroom, or work areas. -Make sure everyone has access to water and healthy snacks.
Social and Emotional Climate	Promote a positive school climate where respect is encouraged, and students can seek help from trusted adults.	-Identify and track students with emotional, behavioral, and mental health needs. -Provide or refer students and families to the social worker and/or counseling services.
Psych and Social Services	Identify, track, and provide direct care to students with emotional, behavioral, mental health, or social needs.	Install a Buddy Bench or other gathering place to help students socialize and connect with each other.

The next step in the process flowchart, the *Do* phase., was to create a school or classroom team by identifying interested staff members and recruiting students and caretakers. This could be done with as few as one staff member or the entire ELC.

The team then identified areas of need. Table 1 shows a list of implementation ideas according to the WSCC component. Thus, for example, if the staff identifies a need in the *Health Education* domain, a potential *School Health Service Strategy* to consider would be to make sure that students get health education that includes information on common chronic health conditions such as obesity. An *Idea for Implementation* would be to fill a box with items to promote physical activity and healthy eating or to assign drawing projects with health topics.

After the identified WSCC strategies were implemented, the third PDSA step (*Study*) was to evaluate ongoing improvements throughout the implementation process as well as at the end to the PDSA cycle. After critical analysis, the cycle was continued following the PDSA cycle *(Act)*. This process can involve either the whole ELC, the whole community, or the whole school district, and beyond. A full description of the inputs, internal activities, and outputs is shown in the logic model in Appendix F. Both the model and the flowchart highlight how the

PDSA cycle can be used in response to different levels of leadership buy-in as well as different stages of implementation.

Evaluation of the Project

Measures/Analysis

The measurement and analytic strategies are organized by specific aims. What follows is a description of how each of the specific aims were evaluated. Additionally, in order to organize and understand the multiple expected outcomes of this project, Table 2 was developed.

Specific Aim 1 was to *establish leadership buy-in and support*. To assess if this aim was met, anecdotal evidence of leadership buy-in was abstracted through informal interviews and meeting notes.

Specific Aim 2 was to *map assets and gaps using the SITool.* The Likert scale toolkit was employed to assess the aggregate needs and opportunities of the ELC. The analysis of this aim involved the staff identifying an intervention from at least one domain to implement the WSCC model (refer to Table 1). The strategies for the intervention were then deployed based on the SITool needs assessment survey. The SITool consisted of 60 questions: 50 questions related to each of the tenets; 10 questions identifying the sustainability of the school's approach. The tool gathered responses across a five-point Likert psychometric response scale, in which the staff specified their level of agreement to a statement ranging from 1 (Strongly disagree) to 5 (Strongly agree) (see example Appendix G) (ASCD, 2021). Mean scores for each of the five dimensions measured (healthy, safe, engaged, supported, and challenged) and 10 components (physical education and physical activity; nutrition environment and services;

Table 2: Measures Table

Aim	Measurement/analysis
Establish leadership buy-in and support.	Leadership buy-in obtained. Collaborate with leadership to decide on a pilot or whole school.
Map assets and opportunities using the SITool.	Staff takes SITool. SITool aggregates needs and opportunities. Staff identifies at least one domain to implement.
Create a working group with the staff to develop and deploy WSCC Health Services Strategies.	At least two staff members are interested in forming a team. Team works together to develop and deploy Health Service Strategies.
Track needs, progress, and trends using SITool.	Staff repeats SITool during and after implementation..
Staff will be satisfied with the WSCC initiative and any strategies implemented.	90% of staff agree or strongly agree that the team worked well together and at least one WSCC domain was successfully implemented and added value.

health education; social and emotional school climate; physical environment; health services; counseling, psychological and social services; employee wellness; community involvement; and family engagement) was aggregated and used to describe the overall measure of that domain (Appendix G and Appendix I).

Specific Aim 3 was to *create a working group with the staff to develop and deploy WSCC Health Services Strategies*. Semi-structured one-to-one interviews and focus groups were used to gain insight into how well the intervention was working. Notes and meeting minutes were taken to evaluate continued areas of need for integrating the WSCC model.

Specific Aim 4 was to *conduct a post-implementation evaluation of a health services strategy; track ongoing progress, trends, and ongoing needs*. During the deployment process, bi-weekly meetings were held with the team and led by the project coordinator. These meetings were used to evaluate and reassess areas of need for integrating the WSCC model.

Finally, Specific Aim 5: *staff will be satisfied with the WSCC*. Satisfaction was measured using a survey consisting of 12 questions tailored to the specific needs of this project. Ten of the questions used a five-point Likert scale, the other two were open-ended questions. Five questions elicited feedback from staff on how well the team worked together, five questions referenced successful implementation of the WSCC School Health Services Strategies, and the two open-ended questions provided a format for the team to give authentic feedback and give people a chance to describe their experience in their own voice. Implementation was deemed successful when 90% of staff agree or strongly agree that the team worked well together and at least one WSCC domain was successfully implemented and added value. The frequency and proportion of staff who report that they agree/strongly agree with each item on the 10-question survey was described in relation to the total number of survey respondents.

Ethical Considerations

This project was developed as a QI initiative and was not used for research purposes or designed to address a research problem. There is no formal mechanism for Ethics or Institutional Review Board (IRB) approval at the site school, however leadership approved of the project as quality improvement without the need for further review. As noted in the University of Massachusetts Clinical Quality Improvement Checklist (Appendix H), the project implemented an evidence-based intervention (WSCC) and followed established techniques used in QI.

The project did not meet the definition of human subject's research because it was not designed to generate generalizable findings but rather to provide continuous improvement feedback in the project's local setting. The University of Massachusetts Boston IRB has determined that quality improvement projects do not need to be reviewed by the IRB. The project was discussed with staff at the practice site and any school-specific procedures were adhered to.

Results

The results of this quality improvement project are examined and explained according to the specific aims (Table 2). What follows is a description of the results of the outcome as well as challenges and adaptations:

The Chief Executive Officer (CEO), Vice President of Advancement, Community and Equity, Vice President of Programs, and Assistant Vice President of Programs from the ELC met to discuss if implementing WSCC in the ELC would add value and be feasible. They agreed with the philosophy and methods of the WSCC model and believed that it was important to improve each child's cognitive, physical, social, and emotional development and that the WSCC model provided tools to put a whole child approach to education into action, thus establishing their

investment in the project outcomes (Pallesen et al., 2020). Therefore, leadership buy-in and support was established (aim 1) with a whole school approach. A site champion was identified and the first PDSA cycle was initiated.

The organization's assets and gaps were mapped using the SITool (aim 2). Unfortunately, the tool was found to be too complicated for the entire staff at the ELC so only 13 staff members out of 80 completed the survey. The questions featured language that staff perceived to be more academic than practical. For the 13 staff members who did participate in the tool, the five top areas of need ranked from most to least were: community involvement; employee wellness; physical environment; nutrition environment and services; and physical education and physical activity. Due to the aforementioned limitation of the tool, the mapping of the assets and gaps were augmented by using focus groups after the team was formed. The team agreed on all of the five areas of need with the exception of community involvement. Although they agreed that community involvement was important, due to the constraints caused by COVID-19 it was deemed to be not feasible at the time the project was carried out.

Semi-structured one-to-one interviews and focus groups were used to develop and deploy strategies for implementing WSCC (aim 3). The focus groups consisted of the team members and a moderator. The moderator kept a log with all meeting notes, email interactions, and phone calls with team members. The log recorded the progress and setbacks of the project as well as the ideas and experiences of the staff. As previously mentioned, the team decided to deploy strategies that align with the (a) physical education and physical activity; (b) nutrition

environment and services; (c) employee wellness; (d) and family engagement domains. What follows are the specific interventions for each domain (Table 3).

For the *physical education and physical activity* domain, the team decided to implement exercise and movement throughout the day such as jumping jacks, running, and simply moving feet. One team member also suggested playground yoga. Another Health Service Strategy to promote physical education was to use an incentive chart. In this instance, the toddlers and the infant classroom teachers would break up activities into time blocks of 30 minutes, once the classroom met that time, they would put a star on the chart and whoever ends up with the most stars at the end of the month, would win a $50 gift certificate for a supply store for teachers. Physical activity throughout the day was implemented, however, due to COVID-19, the classroom of the month and playground yoga was put on hold with the intention to resume when the COVID-19 surge died down.

Table 3: School Health Services Integrated at Early Learning Center

WSCC Component	School Health Services Strategies	Implementation Strategies
Nutrition	-Help manage the nutritional needs of students -Promote healthier foods and beverages -Encourage participation in the school meal programs. -Role-model healthy eating behaviors	-Consult with nutritionist -Use colorful posters to remind students to make good food choices. -Talk about healthy eating with the children when they are having lunch or a snack. -Institute nutritional posters in the staff lounge in the classrooms. -Work with a registered dietitian and bilingual dietician student to create coloring pages with fruits and vegetables that include nutritional facts and recipes in Spanish and English.
Physical Activity	-Encourage all children to participate in physical activity, regardless of ability. -Offer opportunities for students to be physically active throughout the school day.	-Implement physical activity throughout the day such as jumping jacks, running, using feet. -Playground yoga. -Use an incentive chart and healthy competition in classrooms.
Family Engagement	-Give parents opportunities to learn about chronic health conditions and school health services. -Encourage families to participate in activities that promote healthy behaviors. Improve the learning, development, and health of families	-Integrate healthy topics into caregiver circles. -Discuss what caregivers do with the children on weekends to stay active and discuss healthy foods. -Offer bilingual recipes and nutrition facts to encourage cooking and caregiver involvement.
Employee Wellness	-Create a healthy work environment for staff. -Encourage school staff to model healthy behaviors.	-Create employee circles. -Provide yoga or meditation at some of the employee circles.

Under the *nutrition environment and services* domain, the team decided to talk about healthy eating with the children when they were having lunch or a snack. The staff also worked with a registered dietitian and bilingual dietician student to create coloring pages with fruits and vegetables that included nutritional facts and recipes in Spanish and English. The registered dietitian reasoned that even if there is no lesson, just having exposure to healthy foods and colors is more than enough to set a foundation to set up a healthy lifestyle. Additionally, the team

thought it would be helpful to institute nutritional boards/posters in the staff lounge and in the classrooms. However, due to staffing constraints caused by COVID-19, the team members did not have the time or resources to do so.

For the *employee wellness* domain, the team decided to focus on employee circles. They intended to have bi-weekly meetings where the teachers could discuss what they are happy about and what could be done to improve satisfaction. They also wanted to provide yoga or meditation at some of the employee circles. However, due to COVID-19, these circles were put on hold.

Finally, for the *family engagement* domain, the team decided to integrate School Health Service Strategies into already established caregiver circles. They were to discuss what caregivers do with the children on weekends to stay active and to discuss healthy foods. Also, the bilingual recipes and nutrition facts provided ways for caregivers to be involved and could encourage cooking with the children. The caregiver circles were held, and the nutrition and coloring pages were deployed.

Due to COVID-19, many of the ideas were planned and initiated but then had to be placed on hold. Appendix I delineates which of the strategies were implemented, which were completed, and which had to be stopped due to COVID-19. Because of the stress on the staff, it was decided that it was necessary to shift attention primarily to *employee wellness*.

Aim 4 was to conduct a post-implementation evaluation of a health services strategy and to track ongoing progress, trends, and ongoing needs. This aim was met, despite having to delay or cancel many of the meetings. During the deployment process, the intention was to have bi-weekly group and focused meetings, but the meetings were often postponed or canceled due to staffing issues caused by COVID-19. When the team was able to meet, they were able to plan,

evaluate, and adjust the WSCC School Health Services Strategies, reinforcing the dynamic nature of this project.

Finally, staff satisfaction with the WSCC (aim 5) was measured using a survey consisting of 12 questions. Overall, the responses were positive. One hundred percent of the team either strongly agreed or somewhat agreed that the team worked well together. Seventy Five percent either strongly agreed or somewhat agreed that implementation of WSCC added value to ELC and no one rated the project negatively. The feedback from open-ended questions, which were meant to give the team a chance to describe their experience in their own voice, were all positive but lamented the limitations caused by COVID-19. What follows is the feedback from the staff with the site name taken out of the comments and "the site" put in its place. This was done in order to maintain anonymity of the project site.

One team member stated that "unfortunately due to Covid-19 it was extremely challenging for our team to stay consistent in meeting and implementing WSCC. Due to extreme staff shortages, where at one point we had 15 open teacher positions, it was challenging for our team to consistently meet and follow up on implementations of WSCC. If we would have been able to meet our staffing needs, we would have been able to improve our implementation of strategies and interventions." A team member also reported that "WSCC is an amazing way to improve health and wellness not only for children at the site but also for families, staff, and our community. One of the most amazing pieces is that it doesn't take much time or energy to implement in a school. Here at the site, we were hopeful and creative in our ideas and ways to implement WSCC but due to lack of time and availability it made it extremely hard to stay consistent and collaborate with one another."

Another respondent stated, " I really wish that times were different, and I was able to be more part of WSCC but wasn't able to be fully committed due to staffing." And finally, one team member commented that "WSCC was a great program, I wish we had more time to implement the ideas for children and families, but I did enjoy being a part of this team." The results from the survey demonstrated staff satisfaction and showed that more than one WSCC domain was successfully implemented and added value. Appendix J shows the results from two of the Likert scale questions and the two open ended questions.

Discussion

Summary

The intervention achieved its overarching aim of implementing the WSCC model into an early learning center. The project used WSCC to guide the implementation and Rogers' DOI to facilitate and accelerate adoption and to ensure the project is sustainable. Despite considerable challenges due to COVID-19, the QI project met the objective of successfully implementing one WSCC Health Service Strategy and, overall, the team was satisfied with the results.

In order to maintain clarity and consistency, the summary section is again organized by specific aims (Table 2). At the ELC, where the project took place, meeting with key leaders and administrators proved to be essential in the success of specific aim one. After the project was vetted with the appropriate decision makers at the school, they agreed that this project fit with routine school program enhancements and would not need formal review. Therefore, it was determined the project would be implemented within the whole school. According to Rogers's DOI, if leadership were resistant, it may be due to a lack of *knowledge.* This could be addressed by exposing leadership to the WSCC model, which may help *persuade* them to make a *decision* to implement the model. Once they decide, *adoption* of the innovation may occur (Mohammadi

et al., 2018). If leadership was interested but did not want to start with a whole ELC approach, working with one class as a pilot program might be feasible.

The results from the SITool were meant to be used as a guide to implement the WSCC evidence-based School Health Services Strategies (aim 2) (CDC, 2019). However, after a few staff members took the SITool survey, it became clear that many of the questions were not applicable to the site. For example, the language of the survey appeared to be written in academic language, which was not inclusive for all staff. Keeping this in mind, and the limited sample number of 13, one can presume that the results of the SITool may not reflect the majority's perceived areas of need. As a result, the mapping of assets and gaps was supplemented with focus groups after the team was formed.

Although they did not provide qualitative data, the focus groups worked well to help understand needs specific to the ELC, hear feedback from the team, and uncover ideas and issues that may not have been picked up by the SITool. The focus groups also aligned with Rogers' Diffusion of Innovation (DOI) Theory as they helped the team view themselves as part of the same system (Rogers, 2002).

The team worked well together to develop and deploy the WSCC Health Services Strategies (aim 3). In the beginning, the team was enthusiastic and perhaps overestimated their ability to implement all of the WSCC School Health Services Strategies they intended. As delineated by Appendix I, there were some strategies that were not able to be fully finalized. It is hard to tell if the strategies would have been completed if COVID-19 didn't impact the ELC as hard as it did. Nevertheless, the project proved to be dynamic and able to adapt accordingly, even with the unusual restraints caused by COVID-19.

The team met as needed and the agenda of these interviews and meetings included assessment and evaluation using Rodger's DOI stages as it applies to the adoption (*confirmation*) process (Rogers, 2002). Evidence from the one-to-one interviews and group meeting outcomes were abstracted from the meeting minutes in order to assess and describe how well the team worked together. As previously noted, the team was able to identify four areas to implement the Health Service Strategies: physical education and physical activity; nutrition environment and services; employee wellness; and family engagement domains (Table 3).

According to the WSCC model, the *physical education and physical activity* domain would offer opportunities for students to be physically active throughout the school day. The team was able to implement small steps such as jumping jacks and running during the day. Even these small activities help to develop motor skills, knowledge, and behaviors for healthy active living. It also helps with physical fitness, sportsmanship, self-efficacy, and emotional intelligence. Integrating physical education in an ELC provides the opportunity for children to establish physically active lifestyles throughout the lifespan (CDC, 2019).

The team originally planned to have a healthy competition between classrooms where the teachers would lead the classrooms do a healthy activity together, such as go for a walk, play outside, dance to music, stretch, do yoga, or even laugh. Each activity would earn a star, which would be placed on an incentive chart. At the end of the month, the classroom with the most stars would win a $50 gift card to a teacher supply store. Two gift cards were donated by parents from the area who are familiar with the ELC. This strategy was halted due to COVID-19. However, they plan to resume when things get back to some normalcy.

Nutrition environments and services are meant to provide opportunities to learn about and practice healthy eating. The whole school can support a healthy school nutrition environment by

promoting healthier foods and beverages, encouraging participation in the school meal programs, and role-modeling healthy eating behaviors. The team partnered with a nutritionist (friend of the project team coordinator) and a nutrition student to develop coloring pages that have healthy foods for the children to color in, as well as nutritional facts and recipes in both English and Spanish. Making children and caregivers aware of healthy foods can help to build a foundation for healthy eating. Healthy eating has been linked to improved learning outcomes (CDC, 2019). Partnering with the nutritionist was also helpful for the team as they learned about techniques for promoting and integrating good nutrition for preschoolers. For example, the nutritionist emphasized that just having the exposure and coloring the healthy foods on the coloring pages is more than enough to set a foundation for a healthy lifestyle.

For the *employee wellness* domain, fostering employees' physical and mental health not only helps the employee, but also allows them to be in a good space to support students' health and academic success. When all of the employees at the school are physically and mentally well, they are less likely to be absent, are more productive, and can serve as role models for students (CDC, 2019). Unfortunately, this domain was mostly neglected during the COVID-19 surges. This was unfortunate becasuse during the surges the staff needed the most physical and emotional support. During the surges the staff at the ELC filled in for positions that were not originally in their job descriptions in order to cover for the staff that were out due to illness or exposures.

Similar to other social determinants of health, COVID-19 highlighted the problems that already existed. Those who work in early education often don't make much more than minimum wage. A survey done pre-COVID, found that only 61 percent of employees who work at child-care centers in Massachusetts are offered health insurance and many have to pay for their own

(Douglass, 2022). The survey also found that up to 41 percent of preschool age providers, many of whom are women of color, reported not having enough money to pay for food and worried about not being able to feed their families (Douglass, 2022). This reinforces the need to address the *employee wellness* domain in the early learning setting.

Despite the challenges with COVID-19, the staff were able to continue caregiver circles and offer support to the families. The attention the ELC staff gave to the *family engagement* domain during what was a challenging time was remarkable, given how much stress they were under. During the COVID-19 surges, families and caregivers were also significantly impacted. Integrating WSCC into caregiver circles was intended to improve the learning, development, and health of students, as well as promote a relationship between school staff and families (CDC, 2019). However, similar to employee wellness, COVID-19 made evident the problems with the current early learning set up in Massachusetts (MA). For instance, MA has one of the most expensive child-care markets in the U.S. and paying for early education primarily falls on caregivers (Douglass, 2022). During COVID-19, the ELC had to close several classrooms, leaving some families without child-care, and making it so caregivers were not able to work.

All over MA, this cycle happened much more frequently in ELCs than K-12 schools as the age group they serve were not eligible for vaccination, were not always able to wear masks, and didn't understand social distancing. The caregiver circles provided opportunities for caretakers to vent their frustrations. The team leader was not involved in the caregiver circles and no notes were taken. However, the team members reported that the caregivers were stressed because of the exposures and classroom closures caused by COVID-19. During one of the circles, a team member offered suggestions for caretakers to create healthy care packages and to

include inexpensive gifts by mixing Epsom salt and aromatherapy, which could be used at home or given as gifts to the community.

The post-implementation evaluation of the health services strategies and tracking of ongoing progress, trends, and needs (aim 4) was done via meetings, emails, and informal check-ins. As COVID-19 surged through the ELC, meetings were postponed or canceled altogether. Sometimes the meetings consisted of only the project team lead and one other team member. During the meetings, the team clearly communicated how stressed and strained the employees were. With this in mind, after the completion of the initial PDSA cycle, the team met to discuss continuing the innovation. They decided to shift attention to *employee wellness*. The team organized a certified practitioner to administer Reiki, a healing technique based on the principle that the therapist can channel energy to activate the natural healing processes and restore physical and emotional well-being. Reiki was administered to the staff via Zoom during a professional development day. According to Roger's DOI, reinvention, which is when an innovation is changed or modified, often happens at the *implementation* stage (Rogers, 2003).

After the energy healer conducted Reiki with the staff, one team member reported the following: "I observed a lot of our staff really engaging in and enjoying the 15-minute short session! I am going to conduct a survey to our teachers and will include a question on if more Reiki work would be a good support to teachers and maybe we can see how we can work together again in the future. As a very anxious person, I often can't sit still and just focus on my energy and deep breathing as my brain is going a mile a minute. It felt so amazing to really focus on the present moment, my body, and the energy I was putting through it." The shift in focusing from the students and caregivers to employee wellness speaks to the adaptability of the staff at the ELC as well as the ability of the WSCC model to be dynamic and versatile.

The final aim was also met as the team reported staff satisfaction with WSCC. The feedback from the staff highlighted how challenging COVID-19 was for them. Despite the challenges, those surveyed voiced approval of WSCC and wished that they had more time to dedicate to it.

Integrating school-based health education and models of healthy lifestyles in early childhood is novel as health education has historically been done in ancillary settings or via a short health class. Therefore, Roger's Diffusion of Innovation (DOI) theory proved to be a helpful conceptual model for implementing WSCC at the ELC (Rogers, 2002). This was the first time that health promotion was truly integrated into every aspect of the child's learning experience. Although prior to implementation, it was evident that the mission and philosophy of the school aligned well with WSCC, there were questions about how receptive the staff would be to a new project given the constraints of the Covid-19 pandemic. Also, it appeared that previous wellness policies had been driven primarily by senior administrative staff and it was unclear how receptive the program would be to an innovative project that would be driven by stakeholders from different parts of the ELC system. This approach would represent a significant change in how innovations were accomplished during a normal period, let alone during COVID-19.

As noted previously, *knowledge* was first disseminated to leadership which may have helped to move the project quickly to the *persuasion* and *decision* stages and finally to *implementation* stage. However, the real test of the theory was whether it would be possible at the *implementation* stage for the team to successfully drive the innovation. If so, this would be the first time an interdisciplinary team at the ELC had "turned ideas into action and action into learning" (Rogers, 2002).

Team members were very interested in the innovation during the *persuasion* stage but keeping them connected during the *implementation* stage was challenging due to the disruption created by COVID-19. Despite all of these challenges, when the team members were able to meet, they actively sought information about the WSCC model and thought of new ways to adapt and implement health service strategies. Through the knowledge gained by having experts in nutrition and energy healing discussions, the team was able to initiate activities in the classroom for children (coloring activities), and at home to caregivers (recipes and nutritional facts), and a special stress reduction project for staff.

Each of the activities implemented represented a multidimensional school-based approach to promote social, emotional, and physical health and wellness through a whole school approach. The fact that the school has expressed interest in continuing a WSCC approach to innovations is *confirmation* of the success of the DOI approach. Clearly, despite the challenges, the team viewed themselves as part of the same larger system and were able to establish support and activate networks (Rogers, 2002).

Despite the project's success in meeting all its aims, there were limitations. For example, COVID-19 impacted the ability to deploy all of the health service strategies that were originally intended. It also made it difficult for the team to meet on a regular basis and significantly decreased staff morale, which likely affected the team's excitement about the innovation. Another limitation was the SITool. For optimal comprehension and compliance, the SITool questions should be written in clear and concise language. If the SITool were more inclusive and user-friendly, it could potentially give every staff member a chance to identify perceived needs and opportunities of the school.

An additional limiting factor was that the WSCC model was complicated to conceptualize. The stepwise approach of the aims and objectives aided in making this complex project successful. Having leadership buy-in and support was also key to the success of the project. Additionally, the project team lead was well versed in the WSCC model, available and able to adjust to changes, and have a network of community partners/outside resources. The team members were also an asset as they were excited about the project, believed in the WSCC model, and were willing to take the time to integrate the WSCC Health Service Strategies into the ELC. If not for these assets, the project may have been too complex to successfully implement.

Despite its limitations, the project met its desired goal to provide a multidimensional and comprehensive approach to school-based healthy lifestyle. Therefore, using the WSCC model as a strategy to improve elementary school students' social, emotional, and physical health and wellness was successful. The approach is also reinforced by the literature showing that a multidimensional approach, involving different levels of integration can improve healthy behaviors in children and can be taught to children as young as preschool (Gillander Gådin et al., 2012; Ling et al., 2014; Piana et al., 2017; Northrup et al., 2020; Rosemond et al., 2015; Zarembia Morgan et al., 2014).

Conclusions

Overall, the WSCC model is a tool that can be used in early education, K-12, and higher education to help schools adopt a holistic approach to health that integrates the school, child, and community. If models such as WSCC are used broadly, it can help mitigate disparity and inequity in healthcare. By integrating health and wellness at every level of development via a

multidisciplinary approach, health awareness and prevention can be improved along the whole age spectrum.

The U.S. is in a critical need of addressing systemic disparities in health and must ensure every child has a healthy start in life. Establishing a healthy foundation across the biopsychosocial domains in early childhood provides an underpinning for lifelong health learning which may help to mitigate disparities. Building a healthy foundation can be done by using global and national models such as the CDC's WSCC model. These models can be integrated in early learning settings as well as other educational settings. Furthermore, integrating these models within the educational systems for nursing, public health, social work, teachers, and medical students so that they may implement health into their practice may have significant effects on the overall health of the community in which they serve. This project provides evidence that may serve as a first step in lessening the predicted healthcare burden while addressing health disparities.

References

About Chronic Diseases | CDC. 13 Jan. 2021, https://www.cdc.gov/chronicdisease/about/index.htm.

ASCD School Improvement Tool. https://sitool.ascd.org/Default.aspx?ReturnUrl=%2f. Accessed 14 Mar. 2021.

Baciu, Alina, et al. *Communities in Action: Pathways to Health Equity*. National Academies Press (US), 2017, https://www.ncbi.nlm.nih.gov/books/NBK425844/.

Belansky, Elaine S., et al. "Disseminating Evidence-Based Physical Education Practices in Rural Schools: The San Luis Valley Physical Education Academy." *Journal of Physical Activity and Health*, vol. 13, no. 9, 2016, pp. 1002–09.

Braveman, Paula A., et al. "Socioeconomic Disparities in Health in the United States: What the Patterns Tell Us." *American Journal of Public Health*, vol. 100, no. Suppl 1, Apr. 2010, pp. S186–96, doi:10.2105/AJPH.2009.166082.

DOE. *2017 Report Card Overview - Boston Renaissance Charter Public School (04810550)*. 2017, https://profiles.doe.mass.edu/reportcard/SchoolReportCardOverview.aspx?fycode=2017&orgcode=04810550.

Douglass, Anne. "Already-Strained Child-Care Field Struggles to Cope with COVID Challenges - The Boston Globe." *BostonGlobe.Com*, 11 Jan. 2022, https://www.bostonglobe.com/2022/01/11/opinion/already-strained-child-care-field-struggles-cope-with-covid-challenges/.

Enrollment Data (2019-20) - Ellis Elementary School (00350072). https://profiles.doe.mass.edu/profiles/student.aspx?orgcode=00350072&orgtypecode=6&. Accessed 6 May 2021.

FRAC. “Hunger & Health: The Impact of Poverty, Food Insecurity, and Poor Nutrition on Health and Well-Being.” *Food Research & Action Center*, Dec. 2017, https://frac.org/wp-content/uploads/hunger-health-impact-poverty-food-insecurity-health-well-being.pdf.

Gillander Gådin, Katja, et al. “Young Students as Participants in School health in Promotion: An Intervention Study in a Swedish School.” *International Journal of Circumpolar Health*, vol. 68, no. 5, Mar. 2012, pp. 498–507.

Goyal, Monika K., et al. “Racial and/or Ethnic and Socioeconomic Disparities of SARS-CoV-2 Infection Among Children.” *Pediatrics*, vol. 146, no. 4, Oct. 2020, https://doi.org/10.1542/peds.2020-009951.

Harriger, Dinah, et al. “Assessment of School Wellness Policies Implementation by Benchmarking Against Diffusion of Innovation Framework.” *Journal of School Health*, vol. 84, no. 4, 2014, pp. 275–83, doi:https://doi.org/10.1111/josh.12145.

Healthy Schools | CDC. 16 Apr. 2019, https://www.cdc.gov/chronicdisease/resources/publications/factsheets/healthy-schools.htm.

HOB. *Health of Boston’s Children Boston Survey of Children’s Health: Parent and Caregiver Perspectives*. 2013, https://files.zotero.net/eyJleHBpcmVzIjoxNjIxMjkyNzM4LCJoYXNoIjoiYTJiMTQ2ODVhODcwN2ZhMTA5NTI3NzAxNzc3OGU5MDIiLCJjb250ZW50VHlwZSI6ImFwcGxpY2F0aW9uXC9wZGYiLCJjaGFyc2V0IjoiIiwiZmlsZW5hbWUiOiJIZWFsdGggb2YgQm9zdG9uOCZcyBDaGlsZHJlbi0gUGFyZW50IGFuZCBDYXJlZ2l2ZXIgUGVyc3BlY3RpdmVzIEJvc3RvbiBQdWJsaWMgSGVhbHRoIENvbW1pc3Npb24sIFJlc2VhcmNoIGFuZCBFdmFsdWF0aW9uIE9mZmljZSBCb3N0b24sIE1hc3NhY2h1c2V0dHMsIDIwMTMucGRmIn0%3D/76d26861efd6790a3a870d7e1164028faa2120db6b1bf091e7cd87b9ba8f9d30/Health%20of%20Boston%E2%80%99s%20C

hildren-%20Parent%20and%20Caregiver%20Perspectives%20Boston%20Public%20Health%20Commission%2C%20Research%20and%20Evaluation%20Office%20Boston%2C%20Massachusetts%2C%202013.pdf.

HOC. *Early Childhood Education - Definition, Description*. http://www.healthofchildren.com/E-F/Early-Childhood-Education.html. Accessed 16 May 2021.

Home of the Office of Disease Prevention and Health Promotion - Health.Gov. https://health.gov/. Accessed 17 May 2021.

HP2030. *Social Determinants of Health - Healthy People 2030 | Health.Gov*. https://health.gov/healthypeople/objectives-and-data/social-determinants-health. Accessed 17 May 2021.

Knopf, John A., et al. "School-Based Health Centers to Advance Health Equity: A Community Guide Systematic Review." *American Journal of Preventive Medicine*, vol. 51, no. 1, July 2016, pp. 114–26, doi:10.1016/j.amepre.2016.01.009.

Langley, Gerald J., et al. *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance*. John Wiley & Sons, Incorporated, 2009, http://ebookcentral.proquest.com/lib/umboston/detail.action?docID=468716.

Ling, Jiying, et al. "Preliminary Assessment of a School-Based Healthy Lifestyle Intervention Among Rural Elementary School Children." *Journal of School Health*, vol. 84, no. 4, 2014, pp. 247–55, doi:https://doi.org/10.1111/josh.12143.

Mohammadi, Mohammad Mehdi, et al. "Evaluating the Adoption of Evidence-Based Practice Using Rogers's Diffusion of Innovation Theory: A Model Testing Study." *Health Promotion Perspectives*, vol. 8, no. 1, 2018, pp. 25–32, doi:10.15171/hpp.2018.03.

NCCDPHP. *About Chronic Diseases | CDC*. 28 Apr. 2021, https://www.cdc.gov/chronicdisease/about/index.htm.

Northrup, Karen L., et al. "L.I.F.E.: A School-Based Heart-Health Screening and Intervention Program." *The Journal of School Nursing*, vol. 24, no. 1, Feb. 2008, pp. 28–35, doi:10.1177/10598405080240010501.

"Our Team | Ellis Early Education Center." *Ellis*, https://www.ellismemorial.org/our-team. Accessed 8 May 2021.

Pallesen, Kirsten Siig, et al. "A Qualitative Evaluation of Participants' Experiences of Using Co-design to Develop a Collective Leadership Educational Intervention for Health-care Teams." *Health Expectations : An International Journal of Public Participation in Health Care and Health Policy*, vol. 23, no. 2, Apr. 2020, pp. 358–67, doi:10.1111/hex.13002.

Piana, Natalia, et al. "An Innovative School-Based Intervention to Promote Healthy Lifestyles." *Health Education Journal*, vol. 76, no. 6, Oct. 2017, pp. 716–29, doi:10.1177/0017896917712549.

Pulimeno, Manuela, et al. "School as Ideal Setting to Promote Health and Wellbeing among Young People." *Health Promotion Perspectives*, vol. 10, no. 4, Nov. 2020, pp. 316–24, doi:10.34172/hpp.2020.50.

Rogers, Everett. *Diffusion of Preventive Innovations*. 2002.

Rooney, Laura E., et al. "Using the Whole School, Whole Community, Whole Child Model: Implications for Practice." *Journal of School Health*, vol. 85, no. 11, 2015, pp. 817–23, doi:https://doi.org/10.1111/josh.12304.

Rosemond, Tiara N., et al. “Dietary Improvements Among African American Youth: Results of an Interactive Nutrition Promotion Program.” *American Journal of Health Education*, vol. 46, no. 1, 2015, pp. 40–47.

Sweet, Melissa. “Childhood Obesity Can Be Prevented, Says Cochrane.” *BMJ*, vol. 343, Dec. 2011, p. d8014, doi:10.1136/bmj.d8014.

Tikkanen, Roosa, and Melinda K. Abrams. *U.S. Health Care from a Global Perspective, 2019: Higher Spending, Worse Outcomes?* doi:10.26099/7avy-fc29. Accessed 7 May 2021.

“WHO | Early Child Development.” *WHO*, 2007, http://www.who.int/social_determinants/themes/earlychilddevelopment/en/.

“WHO | Social Determinants of Health.” *WHO*, 2021, https://www.who.int/gender-equity-rights/understanding/sdh-definition/en/.

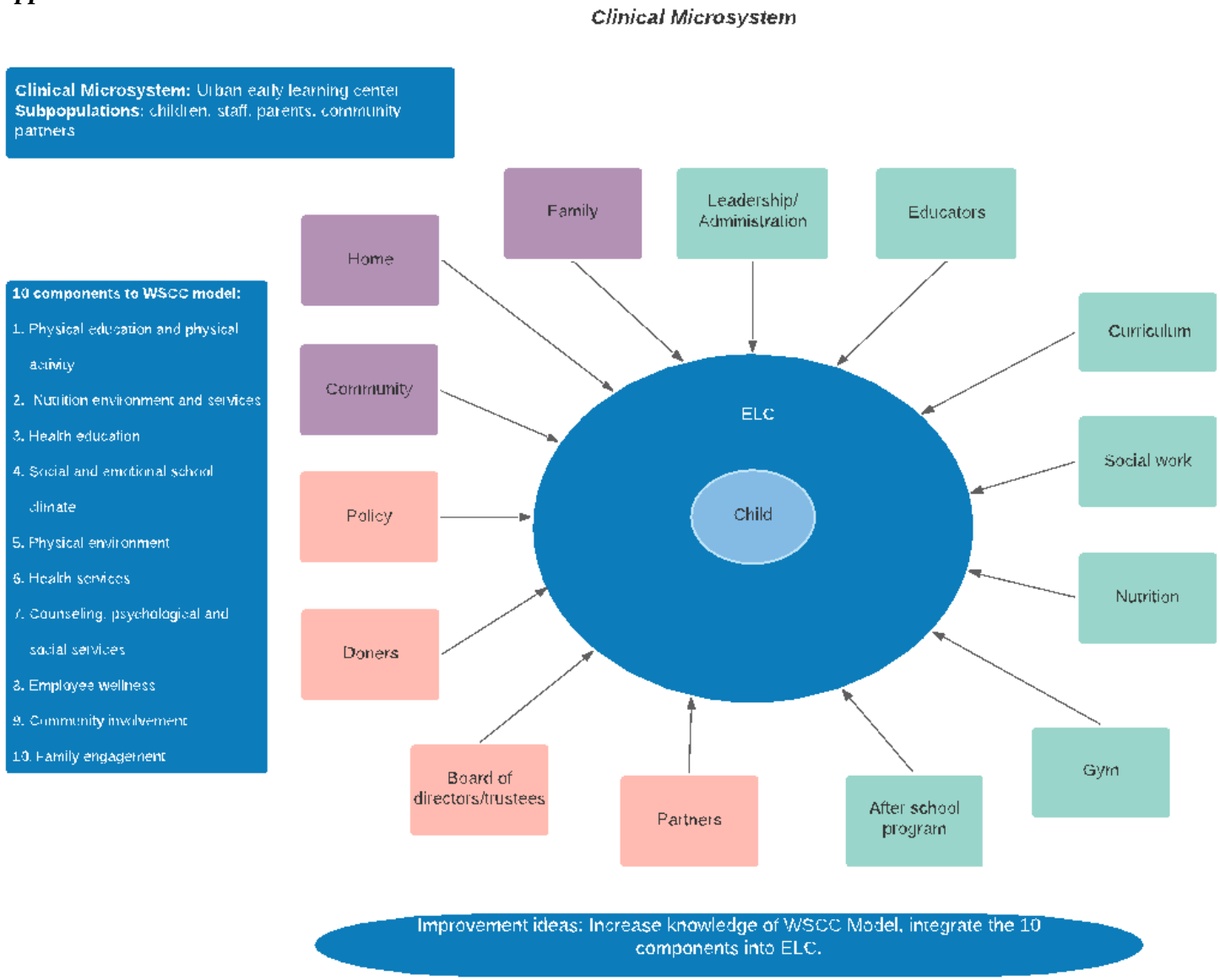
Zaremba Morgan, Ali, et al. “Effectiveness of a Multi-Faceted, School-Based Health Intervention Program with 4th Graders in Alabama.” *Children and Youth Services Review*, vol. 37, Feb. 2014, pp. 46–54, doi:10.1016/j.childyouth.2013.12.006.

Appendix A

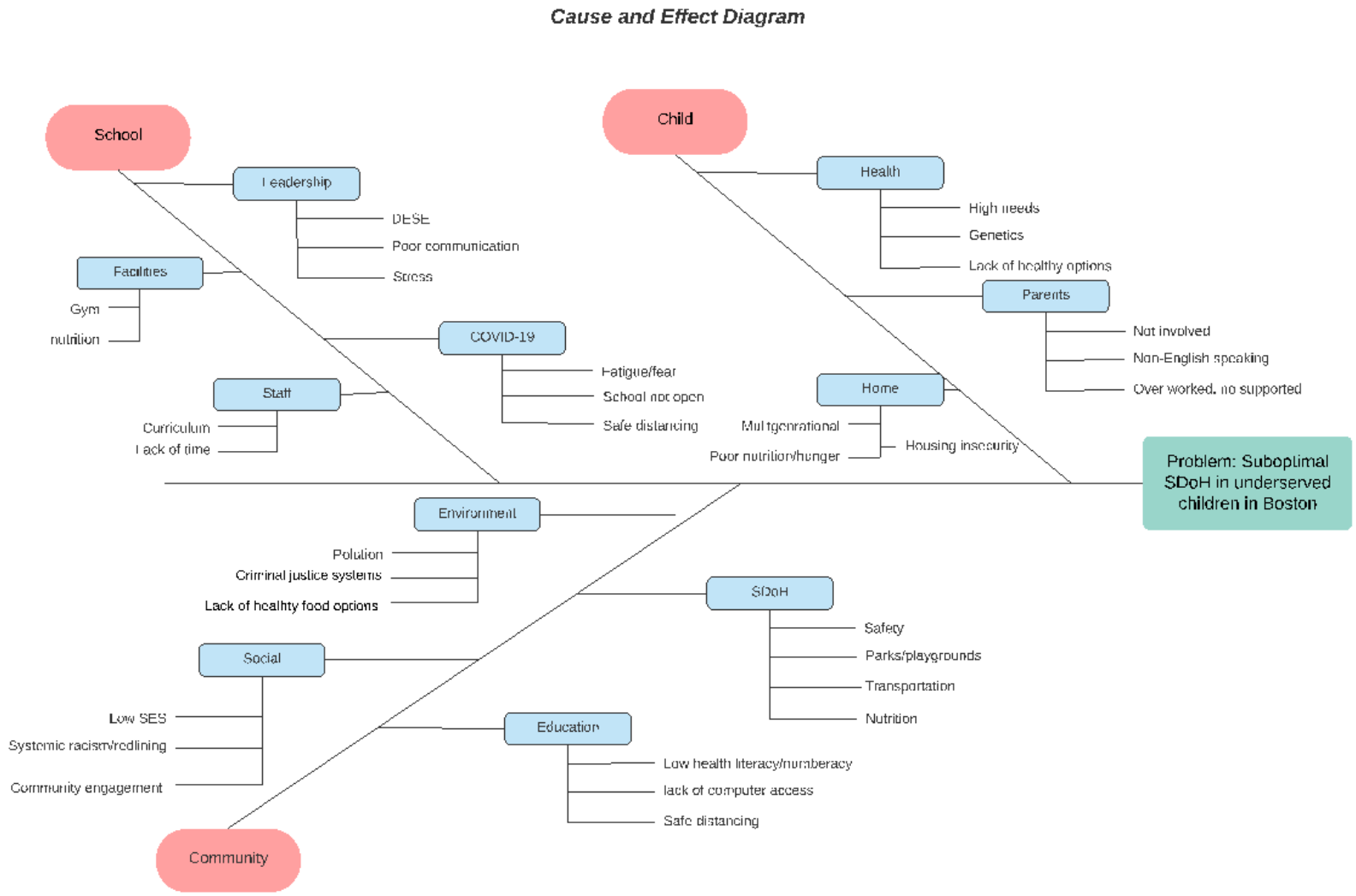
Synthesis Evidence Table - Strategies that can be utilized to improve elementary school students' general health.

Studies	Summary of Significant Findings	WSCC Components	Quality/sample
A. Ling et al., 2014 B. Piana et al., 2017 C. Northrup et al., 2020 D. Rosemond et al., 2015 E. Zarembia Morgan et al., 2014	Multidimensional and comprehensive school-based healthy lifestyle interventions improve healthy behaviors in elementary school-age children.	A. 1, 2, 3, 5, 9, 10 B. 1, 2, 3, 9, 10 C. 1, 2, 3, 6, 9, 10 D. 1, 2, 3 E. 1, 2, 3	A. II, B (USA. Children: N = 1508) B. II, B (Italy. N = 210 Children N = 190 Teachers N = 20) C. II, B (USA. years 1-3:: N = 2,075 Students N = 1,250 Parents N = 825 Year 4: Students N = 2,801 Year 5: Students N = 2,881) D. II, B (USA. N= 224 Control (N=91) intervention (N=133) Black C-97.8% I-96.2%) E. II, B (USA. N = 51 African-American 43% Control group: N = 54 African-American 41%)
F. GillanderGådin et al., 2012	Engaging students as active participants in their learning and health is effective in students as young as preschool-6th grade.	F. 2, 3	F. II, B (Students N= about 150)
G. Belansky et al., 2016	Utilizing PE teachers to help maximize students' physical activity is an effective strategy to help prevent childhood obesity.	G. 1	G. II, B (Students N = 3803 50.6% Hispanic, 70.5% qualifying for free/reduced lunch)
H. Jourdan et al., 2008 I. Kolbe, L. J. et al., 2019 J. Pulimeno et al., 2020	School health programs enable collaborative partnerships and integrative school health components that can improve both health and education outcomes.	H. 3, 9 I. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 J. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	H. V/A I. V/A J. V/A
K. Center for Disease Control (CDC), 2013 L. World Health Organization (WHO), 2021	Global and national health, education, and other types of organizations support school health programs that have a multidimensional approach.	K. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 L. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	K. V/A L. V/A

Appendix B

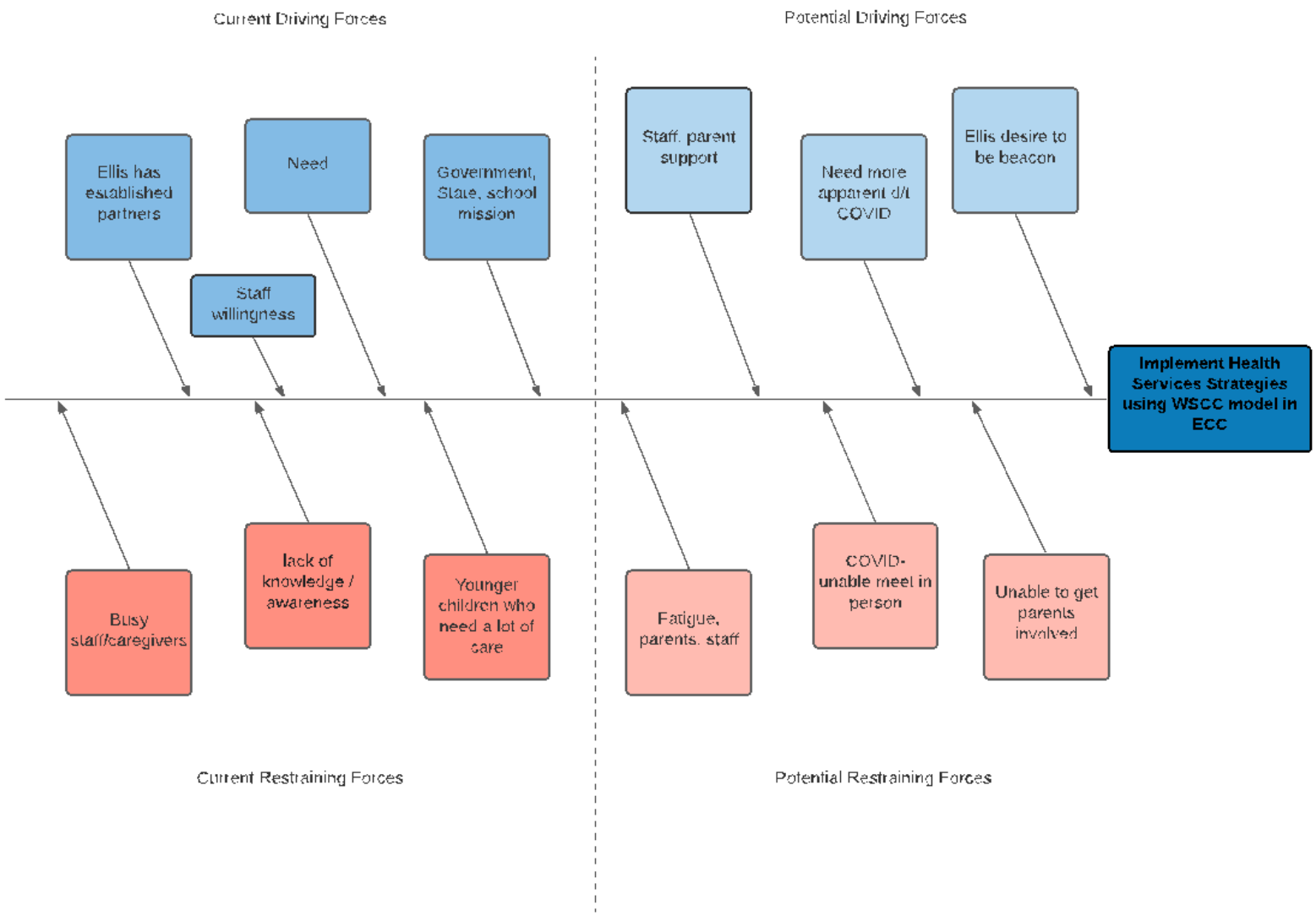

Clinical Microsystem
Clinical Microsystem: Urban early learning center
Subpopulations: children, staff, parents, community partners
10 components to WSCC model:
1. Physical education and physical activity
2. Nutrition environment and services
3. Health education
4. Social and emotional school climate
5. Physical environment
6. Health services
7. Counseling, psychological and social services
8. Employee wellness
9. Community involvement
10. Family engagement
Home
Family
Leadership/ Administration
Educators
Curriculum
Community
ELC
Child
Social work
Policy
Nutrition
Doners
Gym
Board of directors/trustees
Partners
After school program
Improvement ideas: Increase knowledge of WSCC Model, integrate the 10 components into ELC.

Appendix C


Cause and Effect Diagram
School
Leadership
DESE
Poor communication
Stress
Facilities
Gym
nutrition
COVID-19
Fatigue/fear
School not open
Safe distancing
Staff
Curriculum
Lack of time
Child
Health
High needs
Genetics
Lack of healthy options
Parents
Not involved
Non-English speaking
Over worked, no supported
Home
Multigenrational
Poor nutrition/hunger
Housing insecurity
Problem: Suboptimal SDoH in underserved children in Boston
Environment
Polution
Criminal justice systems
Lack of healthy food options
SDoH
Safety
Parks/playgrounds
Transportation
Nutrition
Social
Low SES
Systemic racism/redlining
Community engagement
Education
Low health literacy/numberacy
lack of computer access
Safe distancing
Community

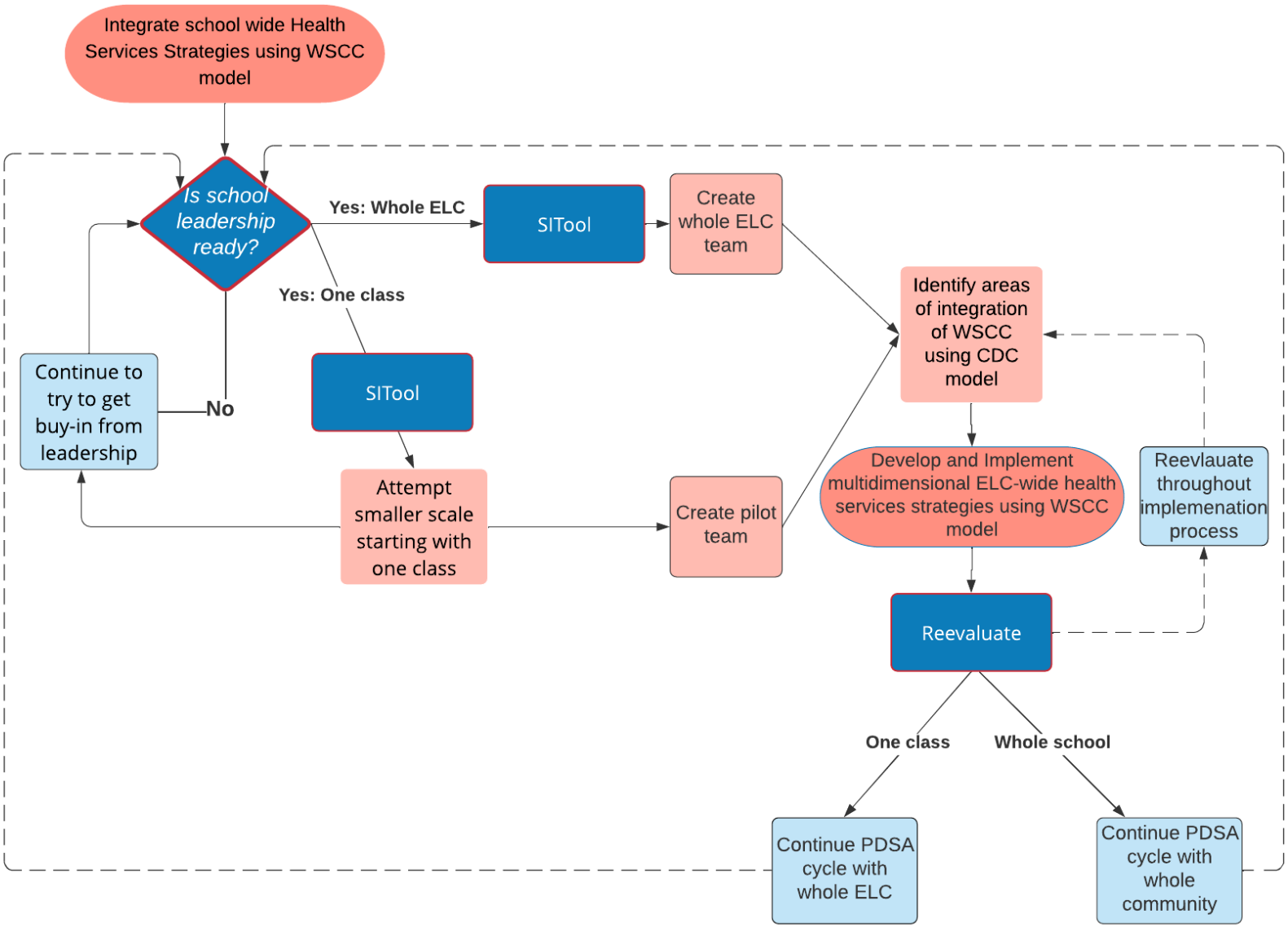
Appendix D

Force Field Analysis

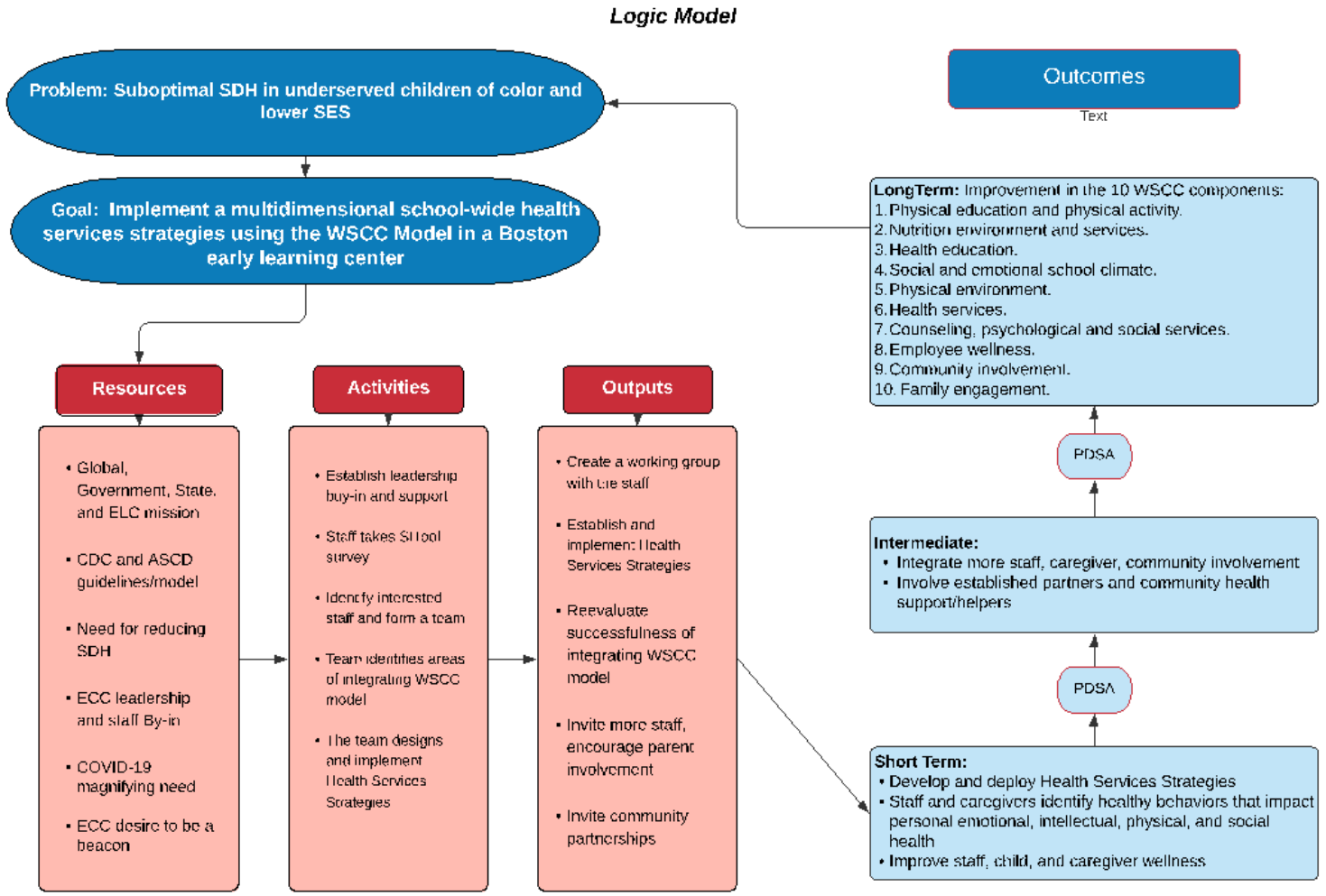


Appendix E

Flowchart



Appendix F


Logic Model
Problem: Suboptimal SDH in underserved children of color and lower SES
Goal: Implement a multidimensional school-wide health services strategies using the WSCC Model in a Boston early learning center
Resources
• Global, Government, State, and ELC mission
• CDC and ASCD guidelines/model
• Need for reducing SDH
• ECC leadership and staff By-in
• COVID-19 magnifying need
• ECC desire to be a beacon
Activities
• Establish leadership buy-in and support
• Staff takes SI tool survey
• Identify interested staff and form a team
• Team identifies areas of integrating WSCC model
• The team designs and implement Health Services Strategies
Outputs
• Create a working group with the staff
• Establish and implement Health Services Strategies
• Reevaluate successfulness of integrating WSCC model
• Invite more staff, encourage parent involvement
• Invite community partnerships
Outcomes
Text
LongTerm: Improvement in the 10 WSCC components:
1. Physical education and physical activity.
2. Nutrition environment and services.
3. Health education.
4. Social and emotional school climate.
5. Physical environment.
6. Health services.
7. Counseling, psychological and social services.
8. Employee wellness.
9. Community involvement.
10. Family engagement.
PDSA
Intermediate:
• Integrate more staff, caregiver, community involvement
• Involve established partners and community health support/helpers
PDSA
Short Term:
• Develop and deploy Health Services Strategies
• Staff and caregivers identify healthy behaviors that impact personal emotional, intellectual, physical, and social health
• Improve staff, child, and caregiver wellness

Appendix G

Tenet	Explanation	Avg. Score	My Score
Healthy	Each student enters school healthy and learns about and practices a healthy lifestyle.	3.55	3.70
Safe	Each student learns in an environment that is physically and emotionally safe for students and adults.	3.20	3.20
Engaged	Each student is actively engaged in learning and is connected to the school and broader community.	3.25	3.10
Supported	Each student has access to personalized learning and is supported by qualified, caring adults.	3.45	3.60
Challenged	Each student is challenged academically and prepared for success in college or further study and for employment and participation in a global environment.	2.45	2.60
Sustainability*	Schools implementing a whole child approach use collaboration, coordination, and integration to ensure the approach's long term success.	3.35	3.30

*Sustainability is not a tenet but showcases how your school is collaborating, coordinating, and integrating efforts to ensure long-term success.

Appendix H

CLINICAL QUALITY IMPROVEMENT CHECKLIST		
Date: April 10, 2021 **Project Leader: Joelle Chateauneuf**		
Project Title: **Using Whole School, Whole Child, Whole Community Model to Improve Elementary School Students' Social, Emotional, and Physical Health and Wellness**		
Institution where the project will be conducted: Urban elementary school		
Instructions: Answer YES or NO to each of the following statements about QI projects.	**YES**	**NO**
The specific aim is to improve the process or deliver of care with established/ accepted practice standards, or to implement change according to mandates of the health facilities' Quality Improvement programs. There is no intention of using the data for research purposes.	**X**	
The project is **NOT** designed to answer a research question or test a hypothesis and is **NOT** intended to develop or contribute to generalizable knowledge.	**X**	
The project does **NOT** follow a research design (e.g. hypothesis testing or group comparison [randomization, control groups, prospective comparison groups, cross-sectional, case control]). The project does **NOT** follow a protocol that over-rides clinical decision-making.	**X**	
The project involves implementation of established and tested practice standards (evidence based practice) and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does **NOT** develop paradigms or untested methods or new untested standards.	**X**	
The project involves implementation or care practices and interventions that are consensus-based or evidence-based. The project does **NOT** seek to test an intervention that is beyond current science and experience.	**X**	
The project has been discussed with the QA/QI department where the project will be conducted and involves staff who are working at, or patients/clients/individuals who are seen at the facility where the project will be carried out.	**X**	
The project has **NO** funding from federal agencies or research-focused organizations, and is not receiving funding for implementation research.	**X**	
The clinical practice unit (hospital, clinic, division, or care group) agrees that this is a QI project that will be implemented to improve the process or delivery of care.	**X**	
The project leader/DNP student has discussed and reviewed the checklist with the project Course Faculty. The project leader/DNP student will **NOT** refer to the project as research in any written or oral presentations or publications.	**X**	
ANSWER KEY: If the answer to **ALL** of these questions is **YES**, the activity can be considered a Clinical Quality Improvement activity that does not meet the definition of human research. **UMB IRB review is not required. Keep a dated copy of the checklist in your files.** If the answer to ANY of these questions is NO, the project must be submitted to the IRB for review.		

Quality Improvement Project Checklist
Version Date: August 13, 2018

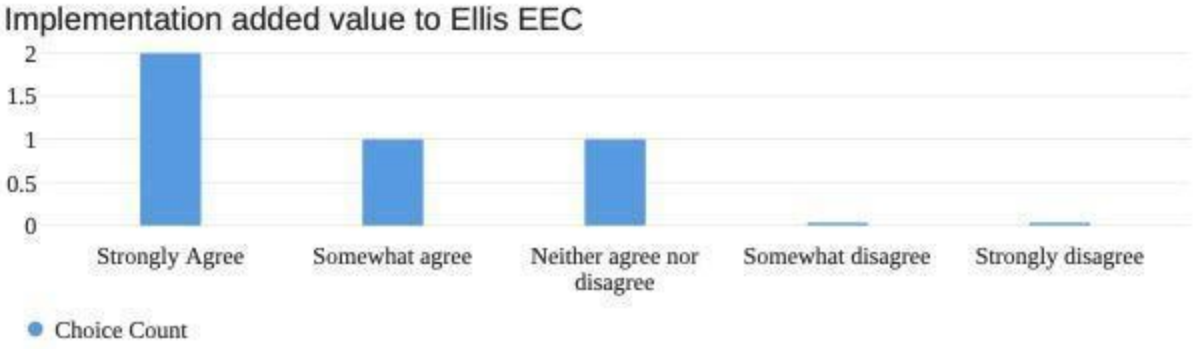
Appendix I

GANTT CHART

Action Items	9/13	9/20	9/27	10/4	10/11	10/18	10/25	11/1	11/8	11/15	11/22	11/29	12/6	12/13	12/20
Create a working group															
Status Update Meetings															
Develop Health Service Strategies															
Deploy Helath Service Strategies															
1. Nutrition environment and services															
1.1 Coloring pages															
1.2 Nutrion sheets															
1.3 Nutrition Board															
2. Physical education and physical activity															
2.1 Classroom of the month															
*3. E*mployee wellness															
3.1 Teacher circles															
4. Family engagement															
4.1 Caregiver circles															
Assess staff satisfaction															

Legend Completed Stopped due to COVID-19

Appendix J



How could implementing WSCC be improved?

Unfortunately due to Covid-19 it was extremely challenging for our team to stay consistent in meeting and implementing WSCC. Due to extreme staff shortages, where at one point we had 15 open teacher positions, it was challenging for our team to consistently meet and follow up on implementations of WSCC. If we are able to meet our staffing needs, we would be able to improve our implementation of strategies and interventions.

Any additional feedback?

WSCC was a great program, I wish we had more time to implement the ideas for children and families but I did enjoy being apart of this team.

Really wish that times were different and was able to be more part of WSCC but wasn't able to be fully committed due to staffing.

WSCC is an amazing way to improve health in wellness not only for children at Ellis but also for families, staff and our community. One of the most amazing pieces is that it doesn't take much time or energy to implement in a school. Here at Ellis we were hopeful in creative in our ideas and ways to implement WSCC but due to lack of time and availability it made it extremely hard to stay consistent and collaborate with one another.