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The Importance of School-based Healthy Living Initiatives: Introducing the Health and Wellness Academy Concept☆

Lindsey Strieter *, Deepika R. Laddu, Jenna Sainsbury, Ross Arena

Department of Physical Therapy, College of Applied Health Sciences, University of Illinois at Chicago, Chicago, IL, USA

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ABSTRACT

Over the last 15 years, the number of school and community based health-intervention programs in the United States has grown. Many of these programs aim to prevent non-communicable chronic disease diagnoses (e.g., obesity, cardiovascular disease and type-2 diabetes). The Department of Physical Therapy in the College of Applied Health Sciences (CAHS) at the University of Illinois at Chicago (UIC) created a school-based wellness program (SBWP) that focuses on nutrition and physical activity, providing tailored experiences that motivate adolescents to make healthier lifestyle choices. The SBWP began as a camp for children in the surrounding neighborhoods and implemented healthy living practices utilizing students from Departments in the CAHS. From this camp, the Health and Wellness Academy (HWA) evolved. This paper provides a review of school-based initiatives and introduces the UIC HWA, an innovative and reproducible approach that can bring positive environmental change by improving health outcomes for children and their families.

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Over the last 15 years, there has been substantial growth in the number of school and community based health-intervention programs in the United States (US), a needed trend given the alarming rates of childhood obesity (currently 17%).[1] Many of these "focused-based," or youth intervention programs are aimed at prevention of an eventual non-communicable chronic disease diagnosis [e.g., obesity, cardiovascular disease (CVD) and type-2 diabetes].[2–4] As such, these focused-based programs promote interventions that facilitate healthy eating practices[5] and/or regular physical activity (PA),[6–8] with a primary outcome of body weight/fat loss or weight maintenance[2,9–11] as well as the myriad of benefits associated with increased PA[12,13] and enhanced cardiorespiratory fitness (CRF).[14–18] However, it is important to differentiate between an "obesity prevention program," and "school-based wellness programs" (SBWP). SBWPs are comprehensive, multi-level approaches that may include components focused on disease prevention (e.g., obesity/overweight), but with the primary goal of facilitating health-promoting change in the school environment, as well as changes in the lifestyles of children, family groups, and ultimately the broader community. Within its constructs, SBWPs include an interdisciplinary approach to health and wellness by incorporating many of the eight key factors identified by the Centers for Disease Control (CDC) School Health Guidelines[19]: 1) physical education; 2) health education; 3) healthy school environment; 4) nutrition services; 5) health services;

Abbreviations and acronyms: CAHS, the College of Applied Health Sciences; CDC, Centers for Disease Control; CRF, cardiorespiratory fitness; CS, college students; CVD, cardiovascular disease; ED, Education Director; ES, elementary students; FMNV, foods of minimal value; HL, healthy living; HWA, the Health and Wellness Academy; PA, physical activity; SBWP, school-based wellness program; UIC, the University of Illinois at Chicago; US, United States.

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* Address reprint requests to: Lindsey Strieter, MS, Department of Physical Therapy, College of Applied Health Sciences, University of Illinois at Chicago, 1919 W. Taylor Street, 450 AHSB, Chicago, IL 60612.

E-mail address: lstriete@uic.edu (L. Strieter).

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6) health promotion for staff, family and community involvement; and 7) social and emotional support. Each SBWP differs in terms of size, nature, duration, required resources, implementation, design, and student demographic. However, the overarching goals remain similar: 1) focus on the needs of the student, teacher and school environment; 2) promote a culture of wellness by providing knowledge and education about healthy behaviors and lifestyle choices, and increase health and disease prevention awareness among students, family, school and community members; 3) provide opportunities for students to actively engage in health promotion programs; 4) increase accessibility to healthy food alternatives and PA; and 5) implement strategies that produce sustainable changes in health behavior.[20] These factors and goals highlight a precision, individualized approach to school-based healthy living (HL) programing.

With this in mind, the Department of Physical Therapy in the College of Applied Health Sciences (CAHS) at the University of Illinois at Chicago (UIC) created a SBWP that focuses on nutrition and PA with the intention to provide tailored experiences that motivate adolescents to make lifestyle choices that build a positive relationship with food and movement. The SBWP began as a health camp for grade-school children who lived in the immediate neighborhood, facilitated by students from the Departments of Physical Therapy and Kinesiology and Nutrition within the CAHS. The camp was held on the UIC's campus, and in doing so, the children were not only able to learn about healthy lifestyle choices, but were also given the opportunity to see the university and engage with its students. From this camp, the Health and Wellness Academy (HWA) evolved. This paper provides a brief review of current school-based HL initiatives and introduces the UIC HWA, an innovative and reproducible approach that has the potential to bring about positive behavior change and improve health outcomes for children and their families.

Healthy lifestyle initiatives and elementary education - state of current evidence

To date, three systematic reviews[21–24] including 75 studies (49 conducted in the US) published between 1985 and 2011, have examined the impact of school-based approaches targeting dietary intake, quality, behaviors and/or preferences of school-aged children, in grades kindergarten through 8th grade. Overall, multi-component intervention models, which are designed to improve child lifestyle changes by engaging children, their families, the school environment and/or the neighboring communities,[22] have shown to be more effective than single-component programs, which primarily involve distributing free or subsidized fruits and vegetables to children in the school setting.[22] An example of successful implementation of a multi-component intervention is the Minnesota 5-a-day Plus program, which incorporated: 1) a behavioral curriculum into classrooms (i.e., team-building and problem solving activities, snack preparation, and taste testing); 2) a family intervention component, which involved information/activity packets and snack packs (5th grade) to prepare at home; 3) a food service intervention component, enhancement of the attractiveness of fruits and vegetables, increasing the choice of fruits and vegetables in the cafeteria; 4) providing additional fruit and vegetable servings as alternatives to baked desserts; and 5) industry support from the 72-member Minnesota 5-a-Day Coalition.[25,26] Similar interdisciplinary study designs have been described in Cooking with Kids (CWT),[27,28] Planet Health,[7] Eat Well and Keep Moving,[29] the High 5 project,[30] California's Hooked On Positive Education (HOPE) After School Nutrition Program,[20] and the Central Texas Coordinated Approach To Child Health (CATCH; originally named the Child and Adolescent Trial for Cardiovascular Health).[31–33] In terms of diet, fruit and vegetable intake has been the focus of most intervention studies (both randomized and non-randomized). Results broadly indicate moderate improvements in dietary intakes, primarily attributable to fruit intake, which increased 1/4 (excluding fruit juices) and 1/3 (including fruit juices) of portion sizes, between control and intervention groups, respectively; other studies reported significant improvements in vegetable intakes among students.[27,28,34,35] For reference, the Dietary Guidelines for Americans recommend between 1 and 1½ cups of fruit and 1½ to 2 cups of vegetables per day for most school-aged children.[21]

Beyond improvements in fruit and vegetable consumption, other multi-component trials have shown success at reducing total dietary fat and saturated fats as well as foods of minimal value (FMNV; i.e., soda, chips, candy),[7,20,29,33,36] in combination with efforts to increase PA engagement within the school environment and reduce television viewing at home. For example, in CATCH, 3rd through 5th grade students receiving the intervention increased time spent in moderate to vigorous PA within physical education classes (from 40% to 50%) and decreased their consumption of fat in school meals (from 39% to 32%).[33] After three years of follow-up, these initial CATCH students had maintained a diet that was lower in total fat and saturated fat and continued to participate in more vigorous PA in grades six through eight compared to students in the control group.[37] Similarly, albeit more localized, programs such as The Cooking with Heart and Soul in Illinois, implemented "junk free" zones at a local high school, providing students the opportunity to trade in junk food for a healthy snack provided by the program coordinators. Expansion of the initial student-focused Cooking with Heart and Soul in Illinois intervention led to a family oriented program that included lessons on how to prepare nutritionally-dense meals, nutrition education seminars, and open family discussions.[20] Comparatively, some school communities have implemented a school-based economic incentive program that adjusts the cost of certain foods[23]; results from the studies of these programs suggest that adjusting prices of healthier food options was effective at increasing fruit and vegetable consumption, and reduced FMNV consumption during the school day. Programs that reduced or eliminated the cost of fruits and vegetables were the most effective at increasing consumption; however, separating the effects of economic incentives from those of other intervention strategies makes it difficult to deduce whether effectiveness was only explained by economic incentive schemes.[23]

A strength of many of the multi-component programs has been the collaboration between research personnel and stakeholders (i.e., students, parents, teachers, principals, administrators, and food service staff) at all stages of the study's development.[20,38] Teacher-friendly, inexpensive curricula that stress health education and literacy resonate with the interests and resources of invested stakeholders, while addressing key research study objectives. Planet Health,[29] CATCH,[31–33] Cooking with Kids,[27,32] and the Minnesota 5-a day plus[25] noted involvement with advocates was essential. Additionally, adequate training of teachers, and school staff, was essential for dissemination, adoption, and maintenance and overall program success. Arguably, to an educator or school administrator, such strengths can also be interpreted as limitations. These studies note that modification of existing lesson plans, additional time and training outside of teaching, other school and district required duties, and assurance that health education curriculum align with state education standards with limited time and flexibility in delivering materials contributed to limited teacher support and participation.[38] Given children, teachers, and school administrators serve as vital stakeholders, their input, support and participation are crucial to minimize such barriers and optimize efficacy of SBWPs.

Building on both the strengths and limitations of prior studies, the Health and Wellness Academy (HWA) was created, with the design intended for health promotion efforts to be individualized, sustainable, have long-term impact potential, and produce and maintain educational efficacy by utilizing trained educators to develop, deliver and disseminate curriculum specifically tailored to the health needs of each student in their classroom. The nativity of the HWA program thereby aims to challenge the current paradigm of a "one-size-fits-all approach" of SBWPs, by putting teachers and educators, not researchers or health professionals, at the forefront of health promotion education delivery.

Introducing the health and wellness academy concept

Health researchers know all too well the statistics of obesity and CVD in the US, and most know that these statistics become increasingly dire as factors such as socio-demographic characteristics are included.[39] Educators, especially those at the elementary schools serving low socioeconomic levels, see the influence of HL or lack thereof in their students' behavior and academic performance.[40,41] Individuals know firsthand the consequences of chronic disease and the barriers that exist to obtaining reliable, accurate information about nutrition and PA, which form the basis of HL practices and prevention of chronic diseases. Researchers have collaborated with the medical community and school districts to implement ways to disseminate health information into the daily curriculum; however, content is often tailored to their own research aims and funding agency objectives rather than on the well-being of the students. Like many inner-city public schools that sit in the shadows of universities, the student's contact with the university/researchers was minimal prior to the HWA being introduced at the University of Illinois at Chicago (UIC). In true conventional fashion, the involvement of the university with the school has often been limited to the duration of a study or a grant, and while knowledge was created and gathered, it is taken back to the university, leaving little to no enhancement of the lives of the students, teachers, or staff that were studied. Thus, from its inception as a summer camp, HWA has sought to achieve a reciprocal authentic partnership with the school, designed in which both entities were to benefit from the relationship.

Unlike other school-based wellness programs, the HWA is a program *developed* and *led* by highly qualified classroom teachers in order to achieve educational efficacy and student mastery. The delivery of HL medicine[42] should be initiated early in life by creating educational experiences retained in childhood resonating with them through adulthood; thus, it is imperative that classroom teachers have a central role. A UIC faculty member housed within the Department of Physical Therapy, who was a former Chicago Public Schools classroom teacher, currently serves as the Education Director (ED) of the HWA. This faculty member's background in urban education and classroom experiences is well suited for this role. The HWA piloted the program as a one-week summer camp for Chicago Public Schools students (12 kindergarten through 5th graders attending), and after success of the pilot implementation, the HWA was tested as a 1.5-hour after-school session held twice per week, delivered to approximately 40 elementary students (ES – 3rd through 5th grade). In conjunction with the HWA, a course (PT 592: The Health and Wellness Academy) offered through the Department of Physical Therapy provided training to 14 college students (CS) from the Departments of Physical Therapy as well as Kinesiology and Nutrition. See Fig. 1 for organizational structure. Course content included didactic learning, open-discussions (1 time per week) and a community outreach experiential learning session at the Chicago elementary school. The course now functions to serve 45 UIC undergraduate and graduate students across disciplines and by adding an additional elementary school, currently serving 76 Chicago youth. Course objectives are listed in Table 1.

The HWA was intentional in providing a program that would be independent from the daily curriculum (i.e. after-school setting as platform of dissemination), where core-subject teachers would not be burdened by the implementation of additional learning activities on top of the content being taught and tested already. However, it remained essential that classroom teachers develop and create the curriculum, with support from health professionals in training, to align with HWA's vision in that the primary end goal not be weight loss, but rather, lifestyle change through behavior modification. Using a 6-step curriculum development model, the HWA sought to provide a comprehensive program focused on identifying the learners' needs, goals and objectives, educational strategies, and assessments.[43] Following this model, it was necessary to first know the learner regarding both their nutritional and PA needs. Once the interdisciplinary team of CS was compiled, the ED conducted pre-assessment and participant interviews, in order to familiarize themselves with the learners/population. From there, areas of strength and growth were identified, and program goals and learning objectives were created. Specific objectives were informed by both the students' needs and the National Health Education Standards as set forth by the CDC.[44] Using the education model of Differentiated Instruction,[45] the ED planned, created, and implemented learning activities that were tailored to the needs and interests of the ES, so that ES could achieve engagement in the learning activities and gain mastery of the content. A sample lesson plan and schedule are shown in Tables 2 and 3. This organic and yet pragmatic nature of the

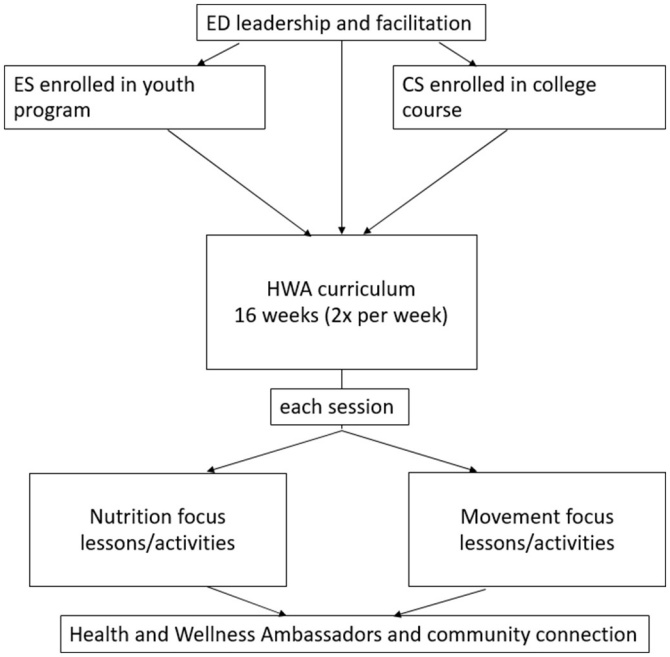

Fig. 1. Organization of the health and wellness academy. ED; education director, ES; elementary student, CS; college student, HWA; The Health and Wellness Academy.

Table 1
Health and wellness academy course objectives.

- Students will identify important characteristics of the community in which they will be participating in.
- Students will identify important characteristics of their learners and their nutritional and physical activity needs.
- Students will observe how to create and implement a lesson plan that is based on the requirements outlined above and CDC National Health Education Standards.
- Students will identify successful characteristics of learning objectives.
- Students will evaluate how learning objectives are connected to the needs of the learners, learning activities, and learning outcomes.
- Students will differentiate between the levels of Bloom's Taxonomy in the context of creating learning objectives.
- Students will create their own learning objectives that align with standards and appropriate assessments.
- Students will define and discuss various mechanisms of differentiating instruction.
- Students will create differentiated learning activities based upon their learning objectives that allow their learners to meet the desired outcomes.
- Students will distinguish between using whole group instruction versus using small group instruction.
- Students will create whole group learning activities and small group learning activities that engage their learners in the learning objective and elicit the desired learning outcomes.
- Students will compare and contrast various forms of small-group instruction.
- Students will plan, teach, and reflect upon lessons that are aligned with a learning objective.
- Students will simulate lessons with their peers.
- Students will collaborate, plan, and create capstone projects to be shared with the community.

Table 2
HWA sample lesson plan.

Objective(s):	Students should be able to… • Understand how to make and achieve fitness goals. • Understand how to record their fitness goals.
CDC Standard(s):	6.5.1 Set a personal health goal and track progress toward its achievement. 6.5.2 Identify resources to assist in achieving a personal health goal.
Essential Question: (connection to students' needs)	How can we measure fitness? • Through various fitness tests How can we improve our fitness? • By establishing baseline scores and making smaller goals on the way to work our way up to the end goal Why is this important? • Setting fitness goals can make physical activity fun and sustain motivation
Learning Activities: Small Groups	1) Introduce the objectives and discuss the importance of setting fitness goals 2) Demonstrate the fitness tests and explain how each test works and what it measures *1) Balance* *a) Romberg test with eyes open and closed* *b) Stork stand with eyes open and closed* *c) Tandem balance test with eyes open and closed* *2) Speed/Agility* *a) Vertical line jump* *b) Cone- star drill* *c) "40 meter dash"* *d) Long jump* *e) Ladder drill* *3) Strength and Endurance* *a) Sit ups* *b) Push-ups* *c) Squats* *d) Jumping Jacks* *e) Plank* 3) Have students complete the tests and record their results 4) Provide students with "Goal Template" and have them create a goal based on their results. Discuss what resources could be used to improve their results 5) Have students complete fitness tests again. Encourage others to support their teammates 6) Closure: Discuss the results and ask: What changed for you when you set a goal? Why? Record their answers.
Resources and/or Material Needed	1) 5 Cones 2) Masking tape 3) Poster paper 4) Markers 5) Tape measure 6) Cell Phone
Location	Gym/Multi-Purpose Room
Extensions/Early Finishers:	1) Talk about what muscles they worked while performing these fitness tests. 2) Create a new fitness test for a peer.

curriculum avoids the "one-size-fits-all" dilemma that many SBWPs encounter when disseminating previously established curriculum in another population/setting. Because of the experience with differentiating instruction, HWA's ED had the ability to create learning activities tailored to the needs of the specific learners/population and modify if necessary, thereby allowing for continued flexibility in the learning objectives and activities to facilitate active engagement and feedback.

In addition to the novelty of utilizing classroom teachers' independent from the classroom, the HWA was offered as a graduate level

Table 3
Health and wellness academy sample schedule.

Week	CDC health education standard(s)[37]	Lesson theme for nutrition and physical activity
1	1.5.1, 1.5.2, 1.5.3, 6.5.1, 6.5.2, 7.5.1	Goal Setting
2	1.5.1, 1.5.2, 1.5.3, 6.5.1, 6.5.2, 7.5.1	Goal Setting
3	1.5.1, 1.5.2, 1.5.3	Team Building & Sportsmanship
4	1.5.1, 1.5.2, 1.5.3	Team Building & Sportsmanship
5	4.5.1, 4.5.2, 4.5.3, 4.5.4	Mental Health and Conflict Resolution
6	4.5.1, 4.5.2, 4.5.3, 4.5.4	Mental Health and Conflict Resolution
7	2.5.5, 2.5.6	Movement Indoors w/ utilizing Technology
8	2.5.5, 2.5.6	Movement Indoors w/ utilizing Technology
9	3.5.1, 3.5.2	Health Information at Home, School, and in the Store
10	3.5.1, 3.5.2	Health Information at Home, School, and in the Store
11	5.5.3, 5.5.4, 5.5.5, 5.5.6, 7.5.2, 7.5.3	Healthier Options and Why
12	5.5.3, 5.5.4, 5.5.5, 5.5.6, 7.5.2, 7.5.3	Healthier Options and Why
13	5.5.3, 5.5.4, 5.5.5, 5.5.6, 7.5.2, 7.5.3	Healthier Options and Why
14	5.5.3, 5.5.4, 5.5.5, 5.5.6, 7.5.2, 7.5.3	Healthier Options and Why
15	8.5.1, 8.5.2	Health and Wellness Application and Community Capstone Projects
16	8.5.1, 8.5.2	Health and Wellness Application and Community Capstone Projects

three-credit course in the Department of Physical Therapy at UIC, tangential to the health and wellness program delivered in the Chicago elementary schools. Being housed in the Department of Physical Therapy in the CAHS allowed the HWA access to various health professional faculty as well as students in training, such as undergraduate, graduate and professional students in physical therapy, nutrition and kinesiology. In our observations at UIC, we found that the students, either currently in a pre-health profession program or enrolled in a health professions program, were profuse in content knowledge or experiential learning supplemented with clinical rotations. However, students were largely limited in the skills and experience to convey that information in authentic environments outside of the traditional clinic. Additionally, we observed interdisciplinary collaboration across the health professional fields was encouraged but appeared to be non-existent. In other words, students studying nutrition were rarely in contact with those students who were studying kinesiology, and none of them were in regular contact with students in medical or nursing school, physical therapy, or the school of public health. Bringing the various disciplines together in one course, created multi-tiered mentorships. The CS contributed to the content delivered to ES during the HWA, while the ED supported them in their educational approaches and strategies. Rather than designing a curriculum centered on the content of a single discipline, the HWA offered a curriculum centered on the effective delivery, dissemination, and practice of education, allowing students to bring individual skills and content and providing a platform for implementation. The planning and collaboration occurred in the 2-hour didactic discussion session each week. As part of their community outreach experiential learning, CS attended the 1.5-hour after-school sessions (laboratory practicum) twice a week. During each session there was a nutrition activity and a movement activity. For the nutrition component, the CS worked with the ES to plan, create, and eat a healthier alternative to a snack/beverage/or meal of their own interest or liking. During the movement component, CS engaged ES in creative PA games in order to facilitate movement and avoid sedentary behavior. Content was designed to ensure that the ES were immersed in activities that pertained to their personal interests. By the end of the program, ES had shown that they were able to know the content, apply the content, and then teach the content, by presenting their mastery of knowledge

and skills in an event shared with the surrounding community. In essence, the ES became new Health and Wellness Ambassadors for their community.

Conclusions

Now in its third year of implementation, the HWA has grown significantly. Between its pilot year as a summer camp and now as a community outreach experiential learning course, the program has added a second school site, quadrupled its enrollment of CS and over doubled the enrollment of ES. Students, parents, schools, and community members have continued to show interest in developing and advancing the program. Thus far, the HWA has demonstrated both sustainability and feasibility by integrating into the day as a stand-alone curriculum serving as either a summer camp, after-school program, or by augmenting the curriculum with an additional course elective. A major strength of this program was the integration of health professional students in the HWA, which allowed for a coalition of collaboration, with the common goal to empower children with health and wellness knowledge - but also allowing each CS to apply their education background and bring their own skill set and perspectives. Additionally, by utilizing CS to facilitate HWA, we were able to have a sustainable program that continues and strengthens the relationships with the surrounding elementary schools, while also being cost-effective by offering college credit versus payment. Notably, utilizing college students by offering course credit provided cost-effective sustainable resources. Further analysis of the program is currently underway, with data collection to follow in 2018 once IRB approval is attained. Provided that the program proves to be efficacious at promoting lifestyle and behavior change, the next steps will be to examine the stability of its benefits and the model's potential for dissemination and replication. Evidence to the contrary will provide insights into how to modify the program to address sources of ineffectiveness.

Statement of conflict of interest

None of the authors have any conflicts of interests with regard to this publication.

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