

## INTERVENTION

### Motivating Adolescents with Technology to CHOOSE Health (MATCH)

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## INTENT OF THE INTERVENTION

Motivating Adolescents with Technology to CHOOSE Health (MATCH) is a **research-tested** intervention designed to improve nutrition, physical activity (PA), and overall health in seventh grade students using a combined educational-behavioral approach. The approach integrates an interdisciplinary curriculum of wellness-themed lessons with individual skill-building, tasks, and motivational strategies for making positive health choices and behaviors.

MATCH addresses several levels of the socio-ecologic model: (1) *individual* through educational materials and instruction along with individualized behavioral modification, (2) *interpersonal* through interactions, activities, and observational learning with peers and teachers, (3) *organizational* (school) through classroom instruction, activities, and monitoring, and (4) *family and community influences* through children sharing knowledge and positive changes in dietary and PA habits with their families.

## OVERVIEW

Motivating Adolescents with Technology to CHOOSE Health (MATCH) is a teacher-developed interdisciplinary approach to student wellness that integrates physical activity, nutrition, and technology education. The MATCH intervention is embedded within national curriculum standards and delivered to 7<sup>th</sup> grade students using a combined educational-behavioral approach. Lessons (e.g., “Nutrients: The Goof Stuff in Food,” “Exercise Prescription,” and “Diabetes”) are taught by subject-matter teachers across multiple academic disciplines and provide a conceptual understanding of positive dietary and physical activity habits and the potential effects on health status. The behavior modification component includes individual application, self-monitoring, goal setting, and skill building to begin internalizing positive health behaviors.

MATCH follows an intentional progression of goals, lessons, and activities informed by Social Cognitive Theory, Self Determination Theory, and the Socio-Ecologic Model. Designed to maximize acceptance and feasibility in schools, MATCH includes a web-based, secure resource system that provides teachers with all necessary resources and training, tracks participant results with functionality to generate reports, and allows school administrators and project staff to monitor fidelity and manage data.

**Intended Population:** 7<sup>th</sup> grade students

**Setting:** Middle schools

**Length of time in the field:** Initial implementation of MATCH began in 2006 in one school. MATCH has subsequently been implemented in 19 schools and is in 15 schools in the 2014-15 school year (as of May 2015).

## HEALTH EQUITY CONSIDERATIONS

MATCH was developed specifically to reach under-resourced children. Its initial implementation was in a school located in a rural North Carolina county with high rates of diabetes, obesity, and cardiovascular disease; the school population had over 60% participation in the federally subsidized school lunch program and over two-thirds were African American. MATCH was expanded into other schools in North and South Carolina, many of which have similarly high proportions of students who are overweight or obese, have low socioeconomic status, and are African American.

## CORE ELEMENTS

*This section outlines the aspects of an intervention that are central to its theory and logic and that are thought to be responsible for the intervention's effectiveness. Core elements are critical features of the intervention's intent and design and should be kept intact when the intervention is implemented or adapted.*

- 1. MATCH School Coordinator:** This position, often referred to as a “champion,” is essential to success at any school. A physical educator or science teacher typically serves as the coordinator, since MATCH follows a “Body Systems” approach. The School Coordinator receives training to perform responsibilities of school setup and managing data collection and entry for evaluation purposes. The School Coordinator also provides an overview (12-minute video) and brief training to 7<sup>th</sup> grade team members during a team planning period.
- 2. Kick-Off Interdisciplinary Unit:** The MATCH Kick-Off creates a school-wide focus on wellness that is student-centered. Baseline data is collected; this data is used by students in subsequent lessons and activities. Subject-matter teachers teach 2-3 lessons of key wellness concepts in their disciplines during the Kick-Off Unit (normally 2-3 weeks) that are reinforced across the subsequent MATCH lessons.
  - a. Lessons:** Lessons are designed to build a foundation of wellness knowledge in students for making good decisions. Selected titles and subject areas include “What is Obesity?” (Science), “What Does the Obesity Epidemic Look Like?” (Math), “How Toxic is Sugar?” (Social Studies), “Calculating Body Mass Index” (Math), and “Re-Think Your Drink” (Language Arts).
  - b. Sleeping, Eating, Activity and Technology (SEAT) Online Survey:** Students complete the pre-SEAT Survey to assess key health behaviors. The survey also has questions to identify students being bullied. Real-time access to behavioral data by school administrators provides an immediate environmental scan of their schools.
  - c. Physical Activity, Nutrition, and Technology Survey (PANT) Online Survey:** The PANT Survey is a student self-assessment of 20 behaviors identified by the Centers for Disease Control and Prevention (CDC) related to childhood obesity. Students identify strengths and areas to be improved and develop strategies to use through reflective journals. Optimally, the PANT survey is repeated, with at least 30 days in between, requiring the student to re-evaluate their performance on identified areas and adjust strategies as necessary.
  - d. Body Mass Index (BMI) Lesson & Goal Sheet:** Following lessons explaining the etiology of obesity and associated consequences, students are taught to compute

BMI and manipulate the BMI formula in Math. Students then compute their own BMIs and graph them on sex-specific growth charts.

- e. **Fitness Test:** The MATCH Fitness Test uses four tests to evaluate components of physical fitness: aerobic endurance (20m PACER); shoulder and abdominal endurance (modified pull-ups and bent-knee sit ups) and low-back flexibility (sit and reach). Most components are included in the FitnessGram, a widely-used approach for assessing students' physical fitness. Data is entered into the data management system for tracking and creation of motivational leaderboards for recognition.
  - f. **S.M.A.R.T. Goals & Action Plan:** The culmination of the Kick-Off unit is students using their data to write S.M.A.R.T. (i.e., specific, measurable, attainable, realistic, and timely) goals and to develop a personalized Action Plan as primary focus throughout the course of MATCH.
3. **Core Lessons and Quizzes:** Lessons and activities are classified as Core (included in the Student Workbook) and Supplemental (available in PDF format from the Online Curriculum Index). Core Lessons follow an intentional progression using a "Body Systems" approach as the framework (i.e., digestive/nutrition, cardiovascular/physical activity, endocrine, and respiratory systems). Most Core Lessons are in PowerPoint format. These Core Lessons have quizzes in detachable sheets from the Student Workbook that serve as formative assessments.
4. **Student Workbook and Dashboard:** The MATCH Student Workbook includes Cornell Notes sheets, that correspond to each Core Lesson with a PowerPoint, journal entries, quizzes, and other activities that support the application of knowledge and skills. The Workbook is also a time-saver that eliminates the need for photocopying and collating lesson materials. Additionally, the Workbook provides non-fiction instructional passages and documents from the USDA, American Heart Association, and North Carolina Division of Public Health that are used in lessons or can be shared with family members by students.
- The Student Workbook provides physical activity logs that can be entered online through the Student Dashboard. Using the Student Dashboard, students can access their "My Trophy Case" to view badges earned for reaching PA and nutrition goals and learn how to earn badges for reaching other performance indicators for healthy behaviors. Students can view table and graph results in specific "pods" or groups of key performance indicators (e.g., number and results from PACER tests). Leaderboards for Fitness Tests, PACER Clubs, and Mileage Clubs allow all students to achieve success and receive peer recognition for positive performances.
5. **Monitoring and Follow-up:** The MATCH School Coordinator is responsible for tracking the number and sequence of lessons taught using the online Curriculum Management System in order to monitor MATCH implementation at the school. Repeated completion of the online PANT survey throughout MATCH implementation enables students to monitor personal behavior change and achievement of goals. Upon completion of the MATCH curriculum, a post-SEAT survey is administered to all students. Follow-up fitness testing is also done and height and weight measurements are collected, which allow for documentation and evaluation of changes in fitness, BMI and health behaviors in all students.

## RESOURCES REQUIRED

**Staff:** A MATCH School Coordinator is needed to manage MATCH implementation within the middle school. The Coordinator can be a teacher or staff member and is responsible for ensuring Core Lesson planning and delivery by teachers, collecting and managing survey data, and generating reports to evaluate and document progress. The School Coordinator position is estimated to require 16 hours per year (average 30 minutes each week), including training and pre-post data entry. Additionally, subject-matter teachers must be willing to deliver the 4-6 lessons and activities over the course of the year in their disciplines. Optimally 2-3 are taught during the “kick-off,” leaving very few to be completed in disciplines other than Health/Science. The lessons are integrated into the Core curriculum and resource materials are provided, so very little additional staff time or materials are needed.

**Training:** Just prior to the school year of the first year serving as the MATCH School Coordinator, the MATCH Coordinator must attend a one-day training delivered by the MATCH Administrative Staff. This training outlines the program, coordinator responsibilities, and use of the online Curriculum Management System. Team training occurs upon arrival of teachers back to school or during the first week that students return. The MATCH School Coordinator meets with the subject-matter 7<sup>th</sup> grade teachers during a planning period at the school to show an introductory video about MATCH and define roles in lesson delivery. Subject-matter teachers have access to brief web-tutorials that provide details for specific skills. Brief (2-5 minute) on-Screen Training and Wizards teach basic use of the web-management system as needed by the user. The School Coordinator and school administrators can monitor lesson delivery and activities via the online Curriculum Management System through their dashboard of Key Performance Indicators. The Dashboard provides a color-coded graphical interface with alerts and reminders of areas needing attention.

### Materials:

- The Curriculum Management System is a web-based system for accessing, recording, tracking and evaluating major components of the MATCH program. Thus, participating schools must have access to a computer and internet access, but no new specific hardware or software is needed. For participating schools, the system provides online access to the curriculum, including lesson plans, quizzes, and supplemental material. The system also provides a portal for completion of the online surveys used to assess nutrition and PA behaviors by students, entry of student height and weight measures, and recording of completed lessons.
- The Student Dashboard allows students to monitor progress and recognition for PA achievements, log and track PA, and see their individualized survey results.
- The Student Workbook is a pre-printed notebook used by students for lessons and activities during MATCH implementation. Through lessons in the Workbook, students provide details for main ideas from each lesson, journal what they learned and how it applies to them, set goals, and develop action plans around healthful living.

### Other Costs:

- PowerPoint software is needed for the delivery of lessons.
- Although not required for implementation, as part of using external motivation consistent with the Self Determination Theory, at times the program has provided specific items to accompany lessons (e.g., pedometer, water bottles) or small incentive items for distribution as goals are achieved (e.g., stickers, wristbands, lanyards, pens, calculators, drawstring bags, T-shirts). Use of these incentives depends on resources available in each setting. The

“My Trophy Case” and recognition boards included in the Student Dashboard serve as cost-free incentives.

## IMPLEMENTATION

### How It Works:

- 1. Identify and Train a MATCH School Coordinator:** A MATCH School Coordinator (most often a physical education or science teacher with interest in wellness) is identified and trained by MATCH Administrative Staff to oversee MATCH implementation in the school.
- 2. Organize School and Staff Setup:** The MATCH School Coordinator meets with school administrators and teachers to identify subject-matter 7<sup>th</sup> grade teachers responsible for implementation of lessons and activities and also teachers or staff responsible for fitness testing.
- 3. Train School MATCH Team:** The MATCH Team at the school watches an introductory video (12-minutes) on MATCH implementation. The video briefly explains overview and sequencing of key lessons and activities during the Kick-Off. Teachers also are taught to login, access curricula, customize their classes, access data for lessons, and record lessons taught in their checklist. Additionally, the team determines a schedule for the Kick-Off Interdisciplinary Unit and data collection.
- 4. Implement the Kick-Off Interdisciplinary Unit:** The Kick-Off Interdisciplinary Unit includes the delivery of lessons that address important wellness concepts, administration of online surveys (SEAT and PANT surveys) that provide baseline self-assessments of student health behaviors, fitness testing, and initial measurement of height and weight for BMI computation. Findings from these initial assessments are used by the students in developing personalized S.M.A.R.T. goals around weight management, fitness, and/or technology usage that together comprise individual Action Plans. These plans outline strategies for reaching goals and are referenced throughout MATCH implementation.
- 5. Deliver Core Lessons and Student Activities throughout school year:** Core Lessons and activities are to be delivered by subject-matter teachers, and the MATCH School Coordinator ensures timely implementation of these lessons and activities.
- 6. Monitor Progress and Achievements:** Using the online Curriculum Management System, the MATCH School Coordinator can monitor lesson delivery by subject-matter teachers. Additionally, students are encouraged to take the PANT survey throughout MATCH implementation (at least 30 days in between) in order to monitor individual progress and goal-setting for health behavior changes.
- 7. Conduct Post-Data Collection:** Following the completion of the MATCH curriculum, students are to complete the post-SEAT online survey. Fitness testing for all students is also conducted and measurements of height and weight are done for BMI calculation. Using the data collected pre- and post-implementation of the MATCH curriculum allows the MATCH team and school officials to examine changes in students' health behaviors, fitness, and BMI and evaluate MATCH's effectiveness and public health benefits.

### Keys to Success:

- Support and involvement by the school principal is important, and support of higher level of school administration (e.g., School Superintendent) is also very helpful.
- Selecting a MATCH School Coordinator who is well-respected, energetic and skilled to manage program roles and responsibilities is critical to success.  
The MATCH School Coordinator must closely monitor and track progress around lesson delivery. Using the online Curriculum Management System, the Coordinator can examine when and what lessons were taught by the subject-level teachers, which can provide school administrators with feedback for transparency and accountability. The school principal also has access to the Curriculum Management System and should support the School Coordinator as needed with low performing staff members to insure fidelity.
- Enacting frequent teacher “check-ins” via email communication can help to prompt timely lesson delivery.
- Starting the program each year with the Kick-Off Interdisciplinary Unit helps to assure key content is provided in optimal sequence. In all, the curriculum provides access to up to 88 lessons; however, results have shown consistently that if approximately 25 lessons are taught in appropriate sequence then results are achieved.

### Barriers to Implementation:

- Insufficient teacher training and inadequate lesson planning can interfere with the delivery of key lessons and disrupt the sequence of lesson delivery.
- Staff turnover (i.e., school administration and/or teachers) could affect the maintenance of MATCH within the school.
- Subject-level teachers may see their involvement in MATCH as taking away from other class instruction, so efforts must be taken to assure teachers that lessons have already been developed and are embedded within national curriculum standards.
- Use of the Student Dashboard may be underutilized by students, thus limiting the effect of positive feedback and peer recognition on reinforcing good nutrition and PA choices.

## EVIDENCE REVIEW SUMMARY

**Underlying Theory:** MATCH utilizes constructs from several theories and models:

- Social Cognitive Theory: self-efficacy, self-regulation, goal-setting, observational learning (modeling), and outcome expectations.
- Self-Determination Theory for health behavior change: basic psychological needs of autonomy, competence, and relatedness.
- Socio-Ecologic Model: individual, interpersonal, organizational (school), family and community influences.

**Strategies Used:** The MATCH intervention includes the following strategies:

- [School Nutrition Programs to Promote Healthy Eating](#) through the interdisciplinary curriculum delivered by subject-matter teachers that focuses in part on nutrition education and includes skill-building activities around making healthier nutrition choices.
- [Social Support for Healthy Eating](#) through classroom nutrition lessons, discussions, and activities that increase social support for healthy eating and may be affected by peer influences and observational learning (modeling) of peers and teachers.
- [School-based Physical Activity and Physical Education](#) through MATCH's curriculum that educates students on PA and includes pre- and post-fitness tests, PA action plans and goal-setting, and recognition for reaching PA goals and achievements.

- [Social Support for Physical Activity](#) through MATCH lessons and activities implemented in the classroom, such as PA goal-setting and classroom or school-wide recognition for reaching goals, that build social support to increase and sustain regular physical activity.

**Research Findings and Evaluation Outcomes:** MATCH was reviewed as a research-tested intervention. Three peer-reviewed articles and one unpublished manuscript were used to examine the effect of MATCH on changes in body mass index (BMI) measures and self-reported lifestyle behaviors (see “Additional Information” section for references). Changes in mean BMI z-scores (zBMI) from baseline (pre-intervention) to post-intervention, 1-year, and 4-years follow-up were examined overall and by weight status categories (Note: Height and weight were measured by a trained research team using a stadiometer and scale). These changes were compared in intervention and control schools. Shifts in the percentage of participants in each weight category at baseline and follow-up were also examined for intervention and control schools. Self-reported lifestyle behaviors (namely beverage and snack intake, PA, and sedentary behaviors) were also outcomes targeted by the intervention.

Intervention effects for the outcome measures are as follows:

- Students in MATCH intervention schools had significant decreases in mean zBMI at post-intervention and 1-year follow-up; these significant decreases were found across all weight category sub-groups. At 4-years follow-up, mean zBMI significantly decreased among all participants in intervention schools and increased in the control school.
- With respect to shifts in weight categories at 4-years follow-up, the incidence of obesity was lower in intervention vs control schools (13 vs 39%, respectively) and the remission of overweight to healthy weight was higher in intervention vs control schools (40 vs 26%, respectively).
- While no differences in self-reported lifestyle behaviors were found between intervention and control schools post-intervention or at 1-year follow-up, MATCH vs control participants reported fewer total servings of sweetened beverages and snacks and fewer hours of weekday TV time at 4-years follow-up.

## POTENTIAL PUBLIC HEALTH IMPACT

**Reach:** MATCH is designed to reach all seventh-grade students enrolled in regular (“mainstream” or non-Exceptional Education) classes at a middle school. In its initial implementation, MATCH reached 92 of 105 (88%) eligible seventh-grade students in one middle school located in a rural county in eastern North Carolina. Subsequent MATCH implementation in two NC schools reached 189 of 206 (92%) eligible seventh-grade students. On average, the student population where MATCH has been implemented is 63% African American, two-thirds with low socioeconomic status, and 51% overweight or obese.

**Effectiveness:** The MATCH intervention resulted in significant decreases in body mass index z-scores (zBMI) among overweight and obese students in two intervention schools versus the control school: mean zBMI change -0.05 (95% CI:-0.07,-0.03) in intervention schools versus -0.01 (95% CI:-0.04,0.02) in control school ( $p=.03$ ). Sub-group analyses also found significant decreases in mean zBMI in the healthy weight sub-category. Although effect sizes were greater in boys (vs girls) and white (vs African American) students, separate analyses of MATCH’s effectiveness in additional schools did not find varying effect sizes by sex or race. Improvements in zBMI were sustained at one- and four-years post-intervention. Also at 4-years post-intervention, MATCH versus control participants had a lower incidence of obesity (13 vs 39%,

respectively), fewer total servings of sweetened beverages and snacks (8.8 and 9.5 fewer per week, respectively), and 1.9 fewer hours of weekday TV per week.

**Adoption:** Adoption of MATCH in middle schools is facilitated by MATCH being embedded within existing curricula and school operations, an online system for teacher resources, and utilization of existing subject-matter teachers for lesson delivery. While adoption does require a MATCH School Coordinator, this position is typically filled by an existing teacher or school staff member without substantial extra duties/time. To date, MATCH has been implemented in 19 middle schools serving rural, socioeconomically poor, and minority children throughout North and South Carolina.

**Implementation:** The MATCH curriculum is divided into 33 sequenced Core and 45 Supplemental lessons; the online MATCH Curriculum Management System guides the MATCH School Coordinator and subject-matter teachers through lesson delivery, monitoring fidelity, and data management. The MATCH Student Workbook complements the lesson delivery and enables further comprehension of key concepts and skill development; the online Student Dashboard allows the student to complete surveys and log PA activities. MATCH implementation in two schools reported 23 and 26 lessons taught along with implementation of several behavioral activities, such as student self-assessments of nutrition and PA behaviors at baseline and follow-up and student action plans with goal-setting. In these two intervention schools, students maintained their Workbooks and tracked progress throughout the intervention.

**Maintenance:** Sustained decreases in zBMI, lower incidence of obesity, and positive lifestyle behavior changes in students at 4-years post-intervention provide evidence for the long-term effects of MATCH. Maintenance of MATCH implementation within the middle school requires support from school administrators, adequate resources (both time and money), and commitment from the MATCH School Coordinator and subject-matter teachers. Increased familiarity and experience with MATCH by the School Coordinator and subject-matter teachers with successive implementation of the curriculum and activities also supports its sustainability.

## INTERVENTION MATERIALS

MATCH intervention materials include use of the online Curriculum Management System, the Student Workbook, and use of the Student Dashboard.

You can download a series of screenshots from the Center TRT website that provide an overview of the major components of the Curriculum Management System (e.g., online curriculum index, lessons and support files, data entry and management, and lesson checklist) and sample pages from the Student Workbook.

Contact Tim Hardison ([hardisong@ecu.edu](mailto:hardisong@ecu.edu)) or Suzanne Lazorick ([LAZORICKS@ecu.edu](mailto:LAZORICKS@ecu.edu)) for additional information on MATCH intervention materials.

## EVALUATION MATERIALS

Center TRT developed an evaluation logic model and evaluation plan for MATCH. The logic model is intended to guide the evaluation process (as opposed to the planning process). The evaluation plan focuses on the acceptability, extent of implementation, and effectiveness of MATCH. The evaluation addresses the reach, adoption, implementation, and effectiveness of MATCH in improving nutrition, physical activity (PA), and overall health in 7<sup>th</sup> grade students in the school setting. The evaluation plan provides guidance on evaluation questions and types

and sources of data for both process and outcome evaluation. If you are interested in answering questions not listed on the evaluation plan, please refer to a list of additional evaluation questions [here](#). We suggest a variety of data collection tools throughout the evaluation plan.

## TRAINING AND TECHNICAL ASSISTANCE

For more information about logistics, planning, and conducting a MATCH Implementation customized for your location, contact Tim Hardison ([hardisong@ecu.edu](mailto:hardisong@ecu.edu)) or Suzanne Lazorick ([LAZORICKS@ecu.edu](mailto:LAZORICKS@ecu.edu)) for additional information.

## ADDITIONAL INFORMATION

**Web link:** [www.matchwellness.org](http://www.matchwellness.org)

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### **Publications:**

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Lazorick S, Hardison GT, Esserman DE, Perrin EM. (2011) Sustained Body Mass Index Changes One and Two Years Post MATCH: A School-Based Wellness Intervention in Adolescents. *Childhood Obesity*, 2011; 7(5)372-378.