# INTERVENTION TABLE 24

**Screen Time**

| Source | Intervention Components | Study Design and Execution | Reach | Adoption, Implementation and Process Evaluation | Enforcement/ Sustainability | Impacts and Outcomes |
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| **United States** | | | | | | |
| Story, Sherwood (2003); Obarzanek, Pratt (2003); Kumanyika, Story (2003); Kumanyika, Obarzanek (2003); Rochon, Klesges (2003); Treuth, Sherwood (2004); Cullen, Klesges (2004); Klesges, Baranowski (2004); Beech, Klesges (2003); Klesges, Obarzanek (2008); Baranowski, Baranowski (2003); Story, Sherwood (2003); Robinson, Kraemer (2008); Alhassan, Robinson (2008); Robinson, Killen (2003); Kumanyika, Obarzanek (2003)<br><br>Tennessee, Texas, Minnesota, California | Electronic TV time managers used to monitor TV time (home meetings with instructor)<br><br>***OTHER INTERVENTION COMPONENTS:***<br>*Multi-component:* Not reported<br><br>*Complex:*<br>1. Physical activity opportunities in a pilot afterschool program: the Girls health Enrichment Multi-site Studies (GEMS)<br>2. Family education (meetings, food preparation and consumption)<br>3. Nutrition component (skill-building, recipes, food preparation, taste-testing)<br>4. Homework period (girls were given time to do homework) | ***DESIGN:*** Randomized trial<br><br>***DURATION:*** Phase 1: 12 weeks; Phase 2: 2 years (intervention results not provided)<br><br>***SAMPLE SIZE:*** 210 total pilot participants<br><br>*Memphis Phase 1:* 60 girls and their parents/ caregivers; Phase 2: 303 girls (n=153) or the comparison group [self-esteem and social efficacy] (n=150)<br><br>*Stanford Phase 1:* 61 girls intervention (n=28) and a control group (n=33); Phase 2: 127 girls in Group 1 (n=127) and Group 2 (n=134) Groups 1 and 2 were used to maintain blinding<br><br>*Baylor Phase 1:* 35 girls and their parents or care-givers intervention (n=19) or control groups (n=16)<br><br>*Minnesota Phase 1:* 54 participants in intervention (n=26) or control group (n=28)<br><br>***PRIMARY OUTCOME:*** Physical activity (PA), overweight/obesity, and fruit, juice, and vegetable (FJV) consumption<br><br>***MEASURES:***<br>1. Body Mass Index [BMI] (height, weight)<br>2. Fitness tests (timed mile run, maximum sit-ups in 60 seconds)<br>3. 24-hour food log (Diet Analysis Plus 6.0-diet composition)<br>4. GEMS Activity Questionnaire [GAQ] (modified Self-Administered Physical Activity Checklist (SAPAC) physical activity checklist)<br>5. Parent questionnaire (dietary and physical activity habits)<br>6. Blood samples (lipids and lipoproteins)<br><br>***DATA COLLECTION:*** Phase 1 of the Girls Enrichment Multisite Study (GEMS) was conducted collaboratively among four participating field centers in Memphis, Baylor, Minnesota, and Stanford, with a coordinating center and the National Heart Lung and Blood Institute from 1999-2002.<br>*(continued next page)* | 8.8 ± 0.8 mean years of age (Phase 1 sample): 8-10 year olds, 100% Female, 100% African American, Lower-income; Middle-income (income levels vary among the study sites)<br><br>The Memphis intervention is delivered in low-income community settings that should be translatable to other communities; participants are healthy and not selected on basis of disease risk factors. Other study sites did not specify generalizability.<br><br>Mean BMI of GEMS girls was substantially higher than that of age-matched African-American girls in the National Heart, Lung, and Blood Institute Growth and Health Study (NGHS) and that of girls in the more recent NHANES 1999–2002.<br>*(continued next page)* | ***LEAD AGENCY:*** Research teams were from Baylor University, the University of Memphis, the University of Minnesota, and Stanford University.<br><br>***THEORY/FRAMEWORK:*** Social Cognitive Theory (Memphis)<br><br>***EVIDENCE-BASED:*** Not reported<br><br>***REPLICATION/ ADAPTATION:*** Not reported<br><br>***ADOPTION:*** Not reported<br><br>***IMPLEMENTATION:*** These articles were based off of a physical activity program piloted in afterschool: the Girls health Enrichment Multi-site Studies (GEMS).<br><br>The Memphis intervention consisted of a child-targeted family intervention once a week and a parent intervention one evening a week at two neighborhood centers. The intervention focused on a physical activity component using dance aerobics and a nutrition component using taste testing and food preparation. Students also participated in a knowledge and skill-building period to review. For Phase 2, weekly meetings were held and field trips to the museum and grocery store were incorporated. Control groups were given general health lectures, self-esteem booster sessions, and activities like arts and crafts. Stanford's Phase 1 intervention was a 2.5 hour afterschool session held 5 days a week in a community center and had a family component in the participants' home. Phase 2 was similar to Phase 1 sessions but was held for 2 years. The intervention included dancing and performances, a homework period, and a home component to reduce television watching with a mentor.<br>*(continued next page)* | ***RESOURCES:***<br>1. Incentives/ Prizes (beads, pedometers, t-shirts)<br>2. Videotapes (training sessions)<br>3. Educational materials (pamphlets, newsletters, magnets, recipes, parent packets)<br>4. Activity resources (jump ropes)<br>5. Electronic television monitor (to reduce time)<br>6. Transportation<br>7. Field trip fees<br>8. Child care<br>9. Snacks and bottled water<br>10. Website development<br>11. Internet and computer<br>12. Summer camps/ community centers/schools<br>13. Personnel (mentor, nurses, dance teachers)<br>14. Volunteers (American Heart and Diabetes Associations)<br>15. Fruits for tasting<br>16. Storage area for food<br>17. Games supplies<br>*(continued next page)* | ***SCREEN TIME:***<br>*Stanford Phase 1: 12 weeks (n=61)*<br>1. Girls in the intervention group showed an increased trend for reduced television, videotape, and video game use (adjusted difference =-4.96 hours/week, 95% CI -11.41, 1.49; d=0.40).<br><br>*Stanford Phase 2: 2 years (n=208)*<br>2. Average daily PA and percent time spent in MVPA were significantly inversely related to BMI (average daily activity, r=-0.23, p=0.0008; MVPA, r=-0.29, p<0.0001) and fasting insulin (average daily activity, r=-0.27, p=0.0001; MVPA, r=-0.30, p<0.0001).<br><br>***PHYSICAL ACTIVITY:***<br>*Memphis Phase 1: 12 weeks (n=60)*<br>3. The two active interventions (child and parent-targeted), demonstrated an 11.7% increase in minutes of Moderate to Vigorous Physical Activity (MVPA ).<br><br>*Stanford Study Phase 1: 12 weeks (n=61)*<br>4. Intervention girls showed a higher trend toward increased afterschool PA (adjusted difference =55.1 counts/min, 95% CI =-115.6, 225.8; d=0.21) than control girls.<br>5. Analysis of the 3–6 PM time interval demonstrated an approximate 13% relative difference, favoring the intervention group (adjusted difference between groups, Treatment minus Control [T-C]=91.2 counts/min [95% CI=-65.8, 248.3], p=0.25).<br>6. Intervention girls self-reported approximately 12% more total minutes of moderate-to-vigorous physical activity on the previous day than controls on the GAQ.<br>7. Intervention girls exhibited an average increase of 54.4 ±SD 112.9 counts/min per day, and 35.7 ± SD 221.0 counts/min from 3–6 PM, compared to their baseline values.<br><br>*Minnesota Phase 1: 12 weeks (n=54)*<br>8. Physical activity measures demonstrated consistently greater activity levels in the intervention compared to control group, although none of the differences reached statistical significance.<br><br>***OVERWEIGHT/OBESITY:***<br>*Memphis Phase 1: 12 weeks (n=60)*<br>9. Girls in the both active interventions (child-targeted and parent-targeted) demonstrated a trend toward a reduced BMI and waist circumference compared to the control, although not statistically significant.<br>*(continued next page)* |

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| | | Phase 2 was conducted in Memphis and Stanford from 2002-2006. Fitness tests were administered before and after the intervention. The parent questionnaire was distributed to parents following the 12-week intervention and 6 months following the completion of the program. Anthropometric data was collected at baseline and follow-up. Venous blood was collected in the morning by venipuncture following a 12-hour fast at baseline and follow-up.<br><br>***LIMITATIONS:*** Data was self-reported from surveys; generalizability for any one study was restricted to the specific center at which it was conducted; the study design did not take activity measures on simultaneous days (activity monitor and questionnaire); small sample size; interventions may have had cross-contaminations because all participants were from the same community and given treatments simultaneously; accelerometers did not capture type of activity, water activities, and upper body movements | The Memphis GEMS girls had a larger mean waist circumference and triceps skinfold than did the NHANES 1999–2002 sample. GEMS girls' mean blood pressure was lower that that of comparably aged African-American girls in NHANES 1999–2000.<br><br>***ELIGIBILITY:*** Eligible participants were females aged 8-10 years, physically capable, without medical conditions, not taking any growth medications, and African-American. Some of the sites were looking for girls with a home, a television, parents willing to participate, specific BMI percentiles (mid-level), a home computer and internet access, and fluency in English. Girls held back a grade academically and planning to move in the next two years were not eligible at some of the sites.<br><br>***EXPOSURE/ PARTICIPATION:*** Not reported | Baylor used a 4-week summer day camp, followed by an 8-week Internet-based program plus one Saturday meeting. The intervention focused on the 5-a-day schema and 5-star lunch for FJV servings as well as the GEMS-FFFP (Fun, Food, and Fitness Project) which included dancing and social support through the use of a buddy system. Minnesota used an afterschool program two afternoons a week, in three elementary schools and included a family component. After school activities included dancing, double-dutch, and relay races and family nights included walks.<br><br>***FORMATIVE EVALUATION:*** A Formative Assessment Committee was convened under the auspices of the GEMS Multi-site Steering Committee with a voting member from each field center, the coordinating center, and the NHLBI. An African-American female expert was appointed as committee chair and named as a non-voting member. A working bibliography was compiled. A detailed matrix of programmatic, child, family, and contextual issues related to ethnicity, socioeconomic status, general health and lifestyle, food, physical activity, and body image/weight control was completed. Additional guidance was derived from a workshop that involved scholars with expertise in aspects of African-American culture, child development, and family processes. Formative assessment activities took place through a series of regularly scheduled conference calls (n=14) during October 1999 through June 2000 and through face-to-face meetings held in conjunction with Steering Committee meetings. Written minutes were kept of all teleconferences and meetings.<br><br>***PROCESS EVALUATION:*** Memphis: Audio-taped debriefing meetings were held with the interventionists and project investigators to troubleshoot problems with sessions and plan for future sessions. | ***FUNDING:*** This work was supported by cooperative agreements from the National Heart, Lung, and Blood Institute and the National Institutes of Health. This project has also been funded in part by federal funds from the United States Department of Agriculture/ Agriculture Research Service.<br><br>***STRATEGIES:*** Not reported | 10. Girls in the treatment group exhibited trends toward lower BMI (adjusted difference -0.32 kg/m$^2$, 95% CI= -0.77, 0.12; Cohen's d=0.38 SD units) and waist circumference (adjusted difference =-0.63 cm, 95% CI=-1.92, 0.67; d=0.25) than the control group.<br><br>*Baylor Phase 1: 12 weeks (n=35)*<br>11. In a secondary analysis, there were no differences in BMI, most physical activity measures (MET-adjusted usual GAQ was 0.8 greater in the hypothesized direction), or in preferences for PA or sweetened beverages.<br><br>*Minnesota Phase 1: 12 weeks (n=54)*<br>12. BMI did not differ between treatment groups; there was a trend for waist circumference to be 1.4 cm higher in the intervention than the control (p=0.08).<br><br>***NUTRITION:***<br>*Memphis Phase 1: 12 weeks (n=60)*<br>13. The two active interventions demonstrated a 34.1% decrease in servings of sweetened beverages (p<0.05), and a 1.5% increase in servings of water.<br><br>*Baylor Phase 1: 12 weeks (n=35)*<br>14. Diet differences were found to be in the hypothesized directions for treatment girls: lower total calories (2231 kcal) and percent calories from fat, greater consumption of water and FJV, and lesser consumption of sweetened beverages but were not statistically significant.<br><br>*Minnesota Phase 1: 12 weeks (n=54)*<br>15. Parents of intervention girls reported significantly less availability of higher-fat foods (p=0.001), more low-fat food practices (p=0.009), and lower energy intake from fat in their own diets (p=0.03), compared to parents of control girls. |

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