HIGHMARK® FOUNDATION

Reducing Barriers to Physical Activity for Adjudicated Youth:

Implementing Promising Solutions to Improve Health Outcomes

"From the PATH program I learned how to do more. I learned how to breathe the right way when I work out, how to position myself to get a full range of motion workout and how behavior affects what we eat. I am jumping rope and continuing my cardio in the cottage."

— PATH Program Youth

Introduction

In the United States, an adjudicated youth is a person typically under the age of 17 who has violated a criminal law, as determined by a juvenile court judge. Adjudication is the court process that determines if the juvenile committed the act for which he or she is charged. The term "adjudicated" is similar to "convicted"; the court concluded the juvenile committed the act. Depending on the type and severity of the offense committed, it is possible for persons under 18 to be charged and tried as adults. Other labels applied to these youth are youth in confinement or placement, committed or incarcerated youth, juvenile delinquents, or juvenile justice-involved youth.[1] No matter what the label, incarceration prevents youth from living healthy lives, which can also significantly reduce their chance of achieving their full potential. These youth are also less likely to participate in sports or physical activity, which often contributes to weight gain and a host of physical conditions.

This white paper highlights one residential placement facility located in western Pennsylvania and its successful efforts, with grants totaling more than $300,000 from the Highmark Foundation, in building capacity to improve nutrition and physical activity opportunities for adjudicated youth. The Foundation's interest in confronting childhood obesity and other risk factors for children's health has grown out of its commitment to improve the health of families and communities.

Decline of Adjudication

The United States juvenile justice system has relied far too heavily on incarceration for far too long. With more than 2 million juveniles under the age of 17 arrested and over 60,000 detained annually, the United States incarcerates a larger proportion of youth than any other developed country. The majority of incarcerated youth are held for nonviolent offenses such as drug possession, burglary or theft. The goal of adjudication should be to ensure that youth receive effective treatment and return to their communities, and to find more effective ways to hold them accountable and responsible for their behavior.[2]

Although temporary confinement continues to be overused, Figure 1 shows a steady 10-year decline in youth incarceration and youth crime rates. Over the 10-year period, there has been a significant reduction in the rate of youth confinement; from 2001 to 2011 (latest data available), it dropped by 45 percent.[3] The decline signals a positive trend in less incarceration and more practical solutions implemented by the juvenile justice system.

The recent de-incarceration trend in the United States from 2003 to 2011, as highlighted in Table 1, provides a unique opportunity to implement responses to delinquency that are more cost-effective, humane and capable of providing better outcomes for all youth, their families and communities.[4] Table 2 shows that rates for confined youth in Pennsylvania have decreased similarly during the same time period.[5] Therefore, sending fewer young people to prison has not had the effect of raising youth crime; rather, the youth crime rate also has dropped.[6]

Suggestions for the reduction in youth confinement include positive and meaningful changes in key juvenile-justice reforms enacted in various states in the past decade, such as increasing the availability of evidence-based alternatives, closing or downsizing youth confinement facilities, disallowing incarceration for minor offenses, and restructuring juvenile justice responsibilities and finances among states and counties.[8]

Figure 1: Youth Crime and Incarceration Rates 2001–2011[7]

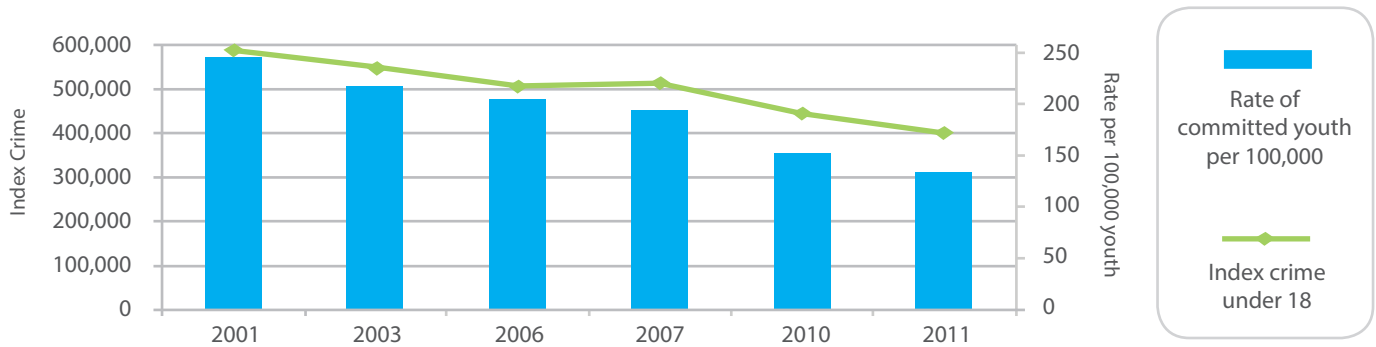
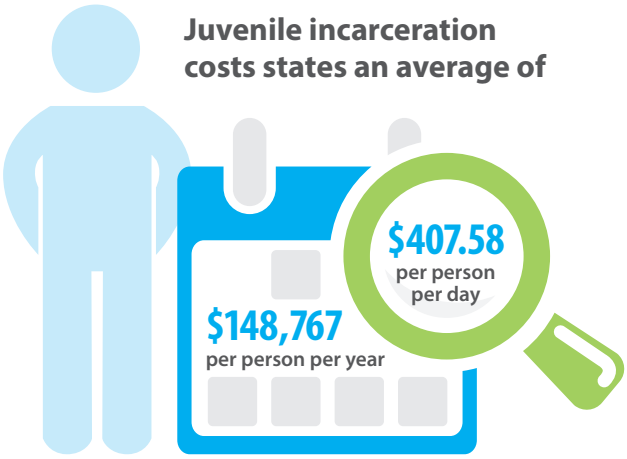


Table 1: United States Youth in Residential Placement 2003–2011

Location	Data Type	2003	2006	2007	2010	2011
United States	Number	96,531	92,721	86,814	70,793	61,423
	Rate per 100,000	303	289	272	225	196

Table 2: Pennsylvania Youth in Residential Placement 2003–2011

Location	Data Type	2003	2006	2007	2010	2011
Pennsylvania	Number	4,341	4,323	4,554	4,134	3,075
	Rate per 100,000	311	313	333	317	239



Cost of Incarceration

Juvenile incarceration costs states an average of $407.58 per person per day and $148,767 per person per year when the most expensive option is used, according to a report by the Justice Policy Institute. As the country debates the cost-effectiveness of mass incarceration, the report notes that jailing youths carries its own exorbitant price tag.[9] Thirty-three U.S. states and jurisdictions spend $100,000 or more annually to incarcerate a young person, while continuing to generate outcomes that result in even greater costs.[10] Aside from the direct costs of incarcerating juveniles, such as the funds required for operating detention facilities, taxpayers also bear some of the burden in the form of lost future earnings, lost tax revenue and other ripple effects that the Justice Policy Institute estimates cost state and local governments nationwide somewhere between $8 billion and $21 billion annually.[11]

Unmet Needs

Unmet physical, developmental and mental health needs faced by incarcerated youth are considerable. Compounding them are problems with the delivery of health care in the correctional setting.[12] The setting or placement to which a young person is remanded, if he or she is adjudicated delinquent, will affect which state agency pays for health care.[13] Both short- and long-term facilities can have problems delivering health care. Health care in short-term facilities can be compromised by the brevity of the adolescent's stay in the institution. There are a myriad of problems with funding brief or extended stays and competing issues such as limited facility finances and whether to fund health or security. However, the larger issue is how to meet public health and other needs through creative yet effective payment and delivery models.[14]

Paying for Unmet Needs

Federal law stipulates that state juvenile justice systems must provide timely and appropriate physical and mental health services to youth, specifically those held in commitment facilities. Juvenile justice, mental health and Medicaid agencies have a common interest in meeting the health needs of youth in the juvenile justice system. However, these three agencies have different, yet overlapping, program objectives, funding sources, target populations and partners at the federal, state and county levels that create both barriers and opportunities in using these agencies' resources to meet the physical and behavioral health needs of children involved with the juvenile justice system.[15] The use of Medicaid for youth in contact with the juvenile justice system presents some unique challenges that can inhibit a state's ability to serve this population. Most notably, federal law prohibits the use of federal Medicaid funds for "care or services for any individual who is an inmate of a public institution" (Social Security Act § 1905(a)(28)(A)). This restriction prevents the use of the federal Medicaid match for some youth in the juvenile justice system.[16]

Although appropriate heath care is essential for good health outcomes, it must be valued from those in decision-making positions. Otherwise, incarcerated youth will be discharged from confinement with the same poor health in which they entered.

Where Pennsylvania Stands

There are several states that have answered the call to develop effective ways of meeting the needs of adjudicated youth. Pennsylvania has made a series of eligibility process improvements for juvenile justice-involved youth by creating a system of cross-agency liaisons and tracking information about clients. Liaisons among probation offices, detention centers and county assistance offices work together to help connect transitioning youth to needed services, such as those administered by Medicaid and/or mental health agencies. Detention centers notify the county assistance office where each youth will be transitioning. The liaisons consider continuing youths' Medicaid eligibility where appropriate. The liaison system is supported by Medicaid eligibility and managed care organization enrollment information tracked and maintained by the state.[17]

Although each state is responsible for financing health services for adjudicated youth, there are opportunities to implement successful and replicable transformation models throughout the United States. At least Pennsylvania is headed in the right direction. But there is still work to do.

Creating Standards for Physical Activity

Physical fitness, nutrition and weight management are usually not a focus for residential treatment providers. They are unfunded, and the judicial system does not believe this is an identified priority despite the requirements detailed in the 2011 Standards for Health Services in Juvenile Detention and Confinement Facilities, defined by the National Commission on Correctional Health Care (NCCHC). According to the NCCHC, all juveniles are to be offered the opportunity to exercise at least one hour per day, seven days a week, and to receive health education and nutritionally adequate, heart healthy and medical diets. A comprehensive listing of standards and compliance indicators is available from the American Academy of Pediatrics.[18] The physical activity standard is aligned with the U.S. Department of Health and Human Services, which recommends that young people aged 6–17 years participate in at least 60 minutes of physical activity daily.[19] Moreover, focused physical activity with specific coaching and mentoring agendas has been shown to have a strong and positive impact on youth at risk of justice involvement or recidivism. Sports or other physical activities can systematically nurture character building, teamwork, goal setting and perseverance.[20]

Youth who are healthy are more confident in themselves and their abilities, and are able to make better decisions that impact their future. This is an aim for every adjudicated youth. Healthy eating, healthy lifestyle and healthy activities should be attainable for every youth in confinement. However, attaining these health goals can be challenging.

George Junior Republic: Hope for Every Youth

One residential facility in western Pennsylvania, George Junior Republic (George Junior), reduced barriers to physical activity for adjudicated youth by creating focused programs based on youths' physical abilities. Youth participated in structured fitness, nutrition and mentoring sessions to encourage and empower them with the abilities to make healthy lifestyle changes. One of the most significant additions was incorporating a certified personal trainer — Charles Cook of One on One Personal Fitness, located in Pittsburgh, PA — as a part of the coordinated care team, which helped to strengthen George Junior's physical activity program. This allowed youth to make significant health gains, among other accomplishments, such as losing weight and decreasing BMI (body mass index). Since he was not affiliated with George Junior, his first priority was to develop trust and respect with the staff and youth. Over time, those relationships grew,

"When I talked to the nurse at the Children's Hospital of Pittsburgh Endocrinology Clinic, she asked me if I worked out or lifted weights. I told her about the HLP program. They told me that if I lose enough weight, maybe I can get off of the insulin and pills and manage my diabetes that way (using diet and exercise)."

— Healthy Lifestyle Leadership Program Youth

which led to successful program outcomes and Mr. Cook's being retained for a subsequent program that demonstrated comparable success.

George Junior is one example of a facility that has successfully undertaken a public health approach to increase physical activity, reduce childhood obesity, improve self-esteem and promote quality development in adjudicated youth. This unique approach brought physical activity and nutrition to a higher level that George Junior was not previously able to achieve. Its efforts show there is hope for adjudicated youth.

George Junior, established in 1909 as a residential treatment facility, has a history of providing health and fitness programming to youth. It was traditionally a facility for court-adjudicated delinquent youth, mostly punitive in nature and lacking a therapeutic model. However, over the years a much more therapeutic model was implemented, and major emphasis was placed on a broader continuum of care, including program expansion for mental health services and drug and alcohol treatment. The majority of youth in care are covered by state-issued medical coverage. George Junior is licensed as a Pennsylvania Medicaid Provider and approved as a Mental Health Outpatient Clinic, and as such, receives reimbursement for services. It is home to over 500 youth on any given day, with a typical placement being less than one year. The ages of the youth range from 9 to 18; however, the average is 16. The population is exclusively male and is ethnically diverse.

Upon admission to George Junior, 75 percent of all youth arrived suffering from trauma and taking at least one prescribed psychotropic medication. Two side effects for many of the drugs are appetite changes and the resulting weight gain. As a result, staff observed a significant increase in the number of overweight or obese youth with comorbidities, including diabetes, high cholesterol and hypertension, as well as increases in acute health conditions as a result of medication, unhealthy lifestyles and lack of physical activity. To address these health conditions that traditionally affect adults, staff and administrators challenged themselves with providing youth with the necessary tools resources to leave George Junior healthy — physically, mentally and socially.

"I like learning and in turn leading other people to be successful. In the Healthy Lifestyles Leadership Program, I have learned how to mix limiting my food intake and exercise to lose weight. In two weeks I have lost between 15 and 20 pounds. Being in the program has been really a positive thing for me as well as others in my life."

— Healthy Lifestyle Leadership Program Youth

A multidisciplinary care team composed of a certified personal trainer (contracted to assist with data collection and deliver the physical activity component), nurses, psychiatrists, social workers and dietitians was formed to create practical and sustainable solutions to effectively reduce weight gain, improve nutrition habits and develop healthy leaders with focused and structured physical activity. A coordinated team-based approach was more effective since staff worked together as a cohesive unit to help youth achieve sustainable long- and short-term health goals.

Keeping Youth Healthy

Historically, George Junior has been focused on mental health and behavior outcomes. However, as a result of the impact of lifestyle programs, it became increasingly focused on the importance of physical health and nutrition on youth success. A new healthy lifestyle program was conceived by staff in 2013, and based on the success of this program, an expanded model was created in 2014 to support overweight/obese youth. For many youth, this was the first time they were educated on the importance of introducing and sustaining physical activity and nutrition in their daily lives.

It is important to note that staff are not permitted to limit the amount of food consumed by youth without an order by a psychiatrist or a court order; this limits a staff member's ability to decrease the amount of calories consumed by youth during placement.

PATH Program

Pointing Adolescents Toward Health (PATH) was conceived with input from medical, treatment and recreation professionals to engage youth in activities that would help with weight gain from unhealthy lifestyles, medications, etc. A total of 85 youth ages 15–18 completed the program. Approximately 68 percent (80) received Medicaid. The program was available to all youth; however, the focus was overweight and obese youth. Normal-weight youth also benefited from the preventive education sessions which could assist with maintaining weight and BMI levels. Children measuring at the 85th to 94th percentiles are considered overweight, because of excess body fat or high lean body mass. A child whose BMI (Body Mass Index) is between the 5th and 85th percentiles is in the healthy weight range. A child with a BMI below the 5th percentile is considered underweight.[21]

The PATH program incorporated a multidisciplinary team approach to exercise, health and nutrition. The program team included a certified personal trainer, dietitian, nurse, and outdoor sports and recreation staff. The purpose of the 40-week program (two sessions of 20 weeks, each at five days per week) was to help residential youth identified as overweight and/or obese to integrate exercise, appropriate nutrition choices and other aspects of a healthy lifestyle into their daily routine. Each youth was assessed upon arrival at the facility. The assessment identified a variety of physical factors (such as height and weight) and also included the completion of a brief questionnaire, survey, and review of a complete lab panel.

The physical activity component consisted of various exercises and customized fitness training programs for each participant based on their ability, fitness level, comprehension and weight; these were directed by the certified trainer and staff. Youth learned how to exercise using kettlebells, treadmills, bands, drive sleds, suspension trainers, training ropes, rowing machines and elliptical fitness cross trainers, with the intent of targeting specific muscle groups, increasing cardiovascular capacity and decreasing weight. Due to the discrepancy in the number of nutrition surveys completed resulting from PATH entry and exit dates, it was difficult to match responses pre- to post-program. However, youth reported that they were eating less food at each meal, becoming more physically active, choosing healthier foods, feeling a lot better by exercising and feeling much better about their physical appearance.

> "I learned to control my eating and exercise habits. I now know that I can still go to a fast food restaurant and make healthy choices by not over or under doing it. The program showed me that if I stay on a good track, positive things happen. I started the program at 214 lbs. and am now down to 200. I feel less out of breath and have more energy. I have gained muscle. I will continue to use all I have learned once I leave here too."
>
> **— Healthy Lifestyle Leadership Program Youth**

PATH Outcome Highlights

The clinical measures presented in Table 3 illustrate the success of the PATH program in reducing BMI, cholesterol and blood pressure from July through November 2013 (Session I) and January through May 2014 (Session II). Participants lost approximately 352 pounds and decreased BMI by two percentage points. LDL (low-density lipoprotein level) and triglyceride level improvements were noted for youth entering and completing the PATH program. At least 20 percent of youth participating in the complete PATH program improved triglyceride and LDL cholesterol levels during the course of their involvement in the program. The majority of youth had normal triglyceride levels of less than 150 mg/dL and LDL levels less than 130 mg/dL, which are within the desired ranges for adolescents.

Table 3: PATH Cumulative Clinical Outcomes

Factors	Results	
Average Age	Age Range 15–18 Years, Average 16 Years	
Youth Height Range	55–73 in.	
Weight Range of Youth Participants	Pre-PATH: 196–342 lbs., Post-PATH: 155–311 lbs.	
Cumulative Weight Lost	351.8 lbs.	
BMI Range	Pre-PATH: 26.6–50, Post-PATH: 23.2–48.4	
BMI Percent Lost (on Average)	2 Percentage Points Per Youth	
Pre-PATH LDL Data (Based on 85 Participants)	Below 70 mg/dL = 4 Youth (5%) Below 100 mg/dL = 66 Youth (78%) 100–129 mg/dL = 10 youth (12%)	130–159 mg/dL = 5 youth (6%) 160 and above = 0 youth
Post-PATH LDL Data (Based on 34 Participants)	Below 70 mg/dL = 3 youth (9%) Below 100 mg/dL = 22 youth (65%) 100–129 mg/dL = 6 youth (18%)	130–159 mg/dL = 3 youth (9%) 160 and above = 0 youth
Pre-PATH Triglycerides Data (Based on 85 Participants)	Below 150 mg/dL = 63 youth (74%) 150–199 mg/dL = 12 youth (14%)	200–499 mg/dL = 10 youth (12%) 500 mg/dL and above = 0 youth
Post-PATH Triglycerides Data (Based on 34 Participants)	Below 150 mg/dL = 27 youth (79%) 150–199 mg/dL = 4 youth (12%)	200–499 mg/dL = 3 youth (9%) 500 mg/dL and above = 0 youth
Triglycerides	Triglycerides ranged from 76 to 236 mg/dL	

It is important to note that this was not tracked in comparison to medications prescribed to youth. Although 34 youth attended the entire 20-week session, those attending less than the 20-week session did not have a post-program lipid panel completed. The clinical staff does not recommend completing a lab panel prior to a three-month period, as it is not believed panel changes would be significant during that period. In addition, consistent turnover in participations impacted outcomes of youth and PATH group dynamics. Staff members learned to obtain better measurement; it was more beneficial to accept youth into PATH with at least a 10-week participation rate, which allowed for more effective outcomes measurement and effective tracking of progress throughout the program.

Enhanced physical activity, incorporating a certified personal trainer and nutrition education proved beneficial for this population. The trainer became more of a mentor and less of an instructor by creating a trusting atmosphere. During both sessions youth expressed positive results from the program. They also reported decreased anger and anxiety levels, less sleep disturbance, increased energy levels and improved self-esteem.

Healthy Lifestyle Leadership Program (HLLP)

The Healthy Lifestyle Leadership Program (HLLP) was also a multidisciplinary approach focused on improving youth health and wellness. Built on the success of the PATH program, the HLLP specifically targeted overweight and obese youth. The distinction between PATH and HLLP is the structured mentoring component. The same certified personal trainer was contracted again to maintain continuity. A total of 206 youth entered the program in late September 2014, and 168 youth completed it in September 2015.

Approximately 87 percent of all participants reported taking at least one prescribed medication, and nearly 60 percent take multiple prescribed medications, with one participant taking seven different prescribed medications per day. The goal of the year-long program was to provide education, fitness interventions, and individualized personal training to address these issues. The program was tailored into five-week sessions with a one-week break period in between each five-week session. A total of 140 youth were engaged in health education and physical education sessions at least two days per week or three to five days per week, schedule permitting, that included cardiovascular, strength and circuit training

and eight physical fitness leadership educational sessions with a certified personal trainer. In addition to physical fitness activities, the fitness trainer also provided nutrition education two mornings per week and one evening per month.

A unique feature of HLLP was inclusion of a mentoring component. The leadership development component was created from PATH's physical activity and nutrition education module. This component enabled youth who adopted the HLLP and exhibited readiness to become leaders/peer mentors to encourage and motivate other youth who may or not be receptive to the program or struggling to achieve program outcomes. Youth leadership surveys were administered to the identified youth leaders to measure leadership knowledge and provide leadership resource materials. As a result, 10 youth were selected as HLLP mentors.

The certified personal trainer met monthly with the 10 leaders over the five weeks, teaching them to use physical health as a tool for coaching and helping them to develop leadership qualities. The goal of the leadership component was to determine whether this evidence-based leadership model was effective in improving fitness outcomes and decreasing BMI in less-motivated youth. The model was effective. Youth achieved weight loss success and served in lead roles as youth motivators. Through the implementation of a peer mentorship component, youth developed the ability to learn to lead and promote the health of their peers. These youth encouraged their peers and demonstrated a strong commitment to the group's success.

HLLP Outcome Highlights

Of the 206 participants who began the program, the average was 16 years and most were insured through Medical Assistance (78 percent). Table 4 shows successful outcomes from program sessions for 168 youth completing the program. A total of 102 youth lost approximately 479 pounds over the program period. The largest percentage of youth had LDL levels in the 100–129 mg/dL range, which are within the desired range, and had triglyceride levels less than 150 mg/dL, which is within normal range.

Table 4: HLLP Cumulative Clinical Outcomes

Factor	Outcome
Number of youth who lost weight	102
Cumulative weight loss	479.3
Average weight loss per youth (pounds)	4.65
Biggest loss in one five-week session by one youth (pounds)	16.4
Average BMI loss per youth (points)	.6
Biggest BMI loss in one five-week session by one youth (points)	3.1
Weight Range Pre-HLLP (pounds)	155.8–329.6
Weight Range Post-HLLP (pounds)	154–328
BMI Range Pre-HLLP (points)	25.6–46.4
BMI Range Post-HLLP (points)	24.4–45
Average BMI Pre-HLLP (points)	33.9
Average BMI Post-HLLP (points)	32.8
Number of youth with a loss of 1 BMI (points)	44
Average Drop of BMI per Youth (points)	0.8
Average LDL (normal range less than 130 mg/dL)	70 mg/dL – 160 mg/dL
Triglycerides (normal range less than 150 mg/dL)	150 mg/dL and 499 mg/dL

PATH and HLLP helped 187 adjudicated youth to achieve goals and show successful results. Collectively, youth demonstrated weight loss of 831.1 pounds, as well as reduction in BMI, LDL, triglycerides and other risk factors, considering the high number of youth taking prescribed medication and the side effects. More importantly, approximately 30 percent of these youth were able to transition to a higher level of care during participation in the program. Higher level refers to an improved level of care. This higher level of care is coupled with improved behaviors and a decrease in the number of restraints. On average, only 5 percent of youth per month demonstrated behavioral issues that prohibited them from participating in PATH or HLLP. This is an important consideration, because a high percentage of youth placed at George Junior are diagnosed with conduct disorder or attention deficit hyperactivity disorder.

Conclusion

George Junior was able to reduce the prevalence of overweight and obesity and other significant risk factors that created barriers to healthy lifestyles in its population by thinking differently. These significant accomplishments show that coordinated physical activity and nutrition programming for adjudicated youth can be effective in the short term. The program also demonstrated improvement in the health care triple aims: improved care, improved health and less health care utilization. These programs provided short-term impact; however, as a result of youth transitioning during the program period, the relatively short time was not sufficient to realize and measure significant reductions for certain program objectives. There is still more work to do to ensure that similar opportunities are available to improve long-term children's health outcomes.

Although not ideal, incarceration can provide opportunities for facilities such as George Junior to promote and encourage healthy behaviors for adjudicated youth. However, further investigation is recommended to determine whether other facilities are working at the same level and achieving similar results to meet health needs of their respective populations beyond the minimum standards.

Keys to Success

- Building a great team of staff and instructors who actually care about the children they serve
- Showing youth respect despite their reasons for confinement
- Making youth accountable and responsible for their actions
- Creating opportunities for positive physical activity to keep youth motivated

"I started the program at 189 lbs. and am now down to 178. I was taught that smaller portions and exercise were important to losing weight, so that is what I did. I decreased my starches and increased my vegetables and proteins and make sure to be physically active at least an hour a day. I will pass along what I have learned to people when I go back home."

— Healthy Lifestyle Leadership Program Youth

Recommendations

Although grant funding to assist correctional facilities and other systems in reducing barriers to structured physical activity for overweight and obese adjudicated youth is helping to bring the issue to the forefront, there are still gaps such as lack of strong policies around health and wellness, optional or non-existent standards, and inadequate financing. Until these gaps are closed, the issue of overweight and obese youth in confinement will continue to be a serious public health issue. Long-term goals are to increase the number of adjudicated youth meeting the recommended guidelines for physical activity and facilities meeting or exceeding the defined standards for providing opportunities daily for physical activity. Therefore, several recommendations are proposed to close the gaps and develop routine standards for health and wellness for adjudicated youth:

1. Mandatory accreditation by the National Commission on Correctional Health Care should be required for all juvenile correctional facilities. Accreditation would ensure that Standards for Health Services in Juvenile Detention and Confinement Facilities are being met.
2. Adequate federal and state financing should be available so that youth correctional facilities are not forced to choose between funding health and other basic needs.
3. Further data collection and study are necessary to better understand the barriers of providing structured physical activity for adjudicated youth, cost effectiveness and cost savings of interventions such as those implemented by George Junior, and to predict costs for sustaining similar programs and taking them to scale.
4. Implement health and physical education programs for a minimum of 12 weeks. Structured nutrition education is important to the success of the program. Many youth provide self-care upon returning home, making discussions related to long-term healthy decision-making key to future successes.
5. Assess specific metabolic, medication and behavioral improvements of participants to fully understand improvements in these areas. In this design, youth would participate in a program for a minimum of 24 weeks. This would showcase the longitudinal impact of a healthy lifestyle.

Mission

The Highmark Foundation is a 501 (c)(3) private, charitable organization dedicated to improving the health, well-being and quality of life for individuals and communities throughout the areas served by Highmark Inc. and its subsidiaries and affiliates. We fulfill our mission by awarding high-impact grants to charitable organizations that implement evidence-based programs aimed at improving community health. Central to the Foundation's mission is identifying and continuously re-evaluating our region's prevailing health care needs. By doing so, the Foundation remains at the forefront of those needs, well equipped to pinpoint issues that most urgently need support.

For more information, visit **www.highmarkfoundation.org**.

Highmark Foundation Board of Directors

References

1. Statistical briefing book: glossary. United States Department of Justice, Office of Juvenile Justice and Delinquency Prevention website. http://www.ojjdp.gov/ojstatbb/glossary.html. Accessed September 24, 2015.
2. Petteruti A, Schindler M, Ziedenberg J; Justice Policy Institute. Sticker shock: calculating the full price tag for youth incarceration. December 2014. http://www.justicepolicy.org/uploads/justicepolicy/documents/sticker_shock_final_v2.pdf. Accessed October 16, 2015.
3. Petteruti A, Schindler M, Ziedenberg J; Justice Policy Institute. Sticker shock: calculating the full price tag for youth incarceration. December 2014. http://www.justicepolicy.org/uploads/justicepolicy/documents/sticker_shock_final_v2.pdf. Accessed October 16, 2015.
4. Youth incarceration in the United States. Annie E. Casey Foundation website. http://www.aecf.org/m/resourcedoc/aecf-YouthIncarcerationInfographic-2013.pdf. Accessed October 16, 2015.
5. Sickmund M, Sladky TJ, Kang W, Puzzanchera C. Easy access to the census of juveniles in residential placement. Office of Juvenile Justice and Delinquency Prevention website. http://www.ojjdp.gov/ojstatbb/ezacjrp. Accessed September 18, 2015.
6. Sneed T. What youth incarceration costs taxpayers. *US News World Rep*. December 9, 2014. http://www.usnews.com/news/blogs/data-mine/2014/12/09/what-youth-incarceration-costs-taxpayers. Accessed October 16, 2015.
7. Petteruti A, Schindler M, Ziedenberg J; Justice Policy Institute. Sticker shock: calculating the full price tag for youth incarceration. December 2014. http://www.justicepolicy.org/uploads/justicepolicy/documents/sticker_shock_final_v2.pdf. Accessed October 16, 2015.
8. National Juvenile Justice Network, Texas Public Policy Foundation. The comeback and coming-from-behind states: an update on youth incarceration in the United States. http://www.njjn.org/our-work/coming-from-behind-states-youth-incarceration. Published December 18, 2013. Accessed October 16, 2015.
9. Sneed T. What youth incarceration costs taxpayers. *US News World Rep*. December 9, 2014. http://www.usnews.com/news/blogs/data-mine/2014/12/09/what-youth-incarceration-costs-taxpayers. Accessed October 16, 2015.
10. New report: costs of youth confinement estimate to run into the billions of dollars each year [news release]. Washington, DC: Justice Policy Institute; December 9, 2014. http://www.justicepolicy.org/news/8478. Accessed October 16, 2015.
11. Sneed T. What youth incarceration costs taxpayers. *US News World Rep*. December 9, 2014. http://www.usnews.com/news/blogs/data-mine/2014/12/09/what-youth-incarceration-costs-taxpayers. Accessed October 16, 2015.
12. Brown RT. Health needs of incarcerated youth. *Bull NY Acad Med*. 1993; 70(3):208-218.
13. National Conference of State Legislatures. Medicaid for juvenile justice-involved children: juvenile justice guide book for legislators. November 10, 2011. http://www.ncsl.org/documents/cj/jjguidebook-medicaid.pdf. Accessed September 18, 2015.
14. Brown RT. Health needs of incarcerated youth. *Bull NY Acad Med*. 1993; 70(3):208-218.
15. Hanlon C, May J, Kaye N; National Academy for State Health Policy. A multi-agency approach to using Medicaid to meet the health needs of juvenile justice-involved youth. http://www.nashp.org/sites/default/files/Multi_Agency_NASHP.pdf. Published December 2008. Accessed September 18, 2015.
16. Skowyra KR, Cocozza JJ, Shufelt JL. Systems of care programs that serve youth involved with the juvenile justice system: funding and sustainability. Technical Assistance Partnership for Child and Family Mental Health website. http://www.tapartnership.org/docs/jjResource_funding.pdf. Published September 2010. Accessed September 18, 2015.
17. Hanlon C, May J, Kaye N; National Academy for State Health Policy. A multi-agency approach to using Medicaid to meet the health needs of juvenile justice-involved youth. http://www.nashp.org/sites/default/files/Multi_Agency_NASHP.pdf. Published December 2008. Accessed September 18, 2015.
18. American Academy of Pediatrics Committee on Adolescence. Health care for youth in the juvenile justice system. *Pediatrics*. 2011;128(6):1219-1235.
19. Youth physical activity guidelines toolkit. Centers for Disease Control and Prevention website. http://www.cdc.gov/healthyschools/physicalactivity/guidelines.htm. Updated August 27, 2015. Accessed November 19, 2015.
20. Butts JA, Bazemore G, Meroe AS. Positive youth justice: framing justice interventions using the concepts of positive youth development. Coalition for Juvenile Justice website. http://www.juvjustice.org/sites/default/files/resource-files/Positive%20Youth%20Justice.pdf. Accessed November 20, 2015.
21. About child and teen BMI. Centers for Disease Control and Prevention website. http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_childrens_bmi.html. Updated May 15, 2015. Accessed December 1, 2015.

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