Social Determinants of Health are “conditions in the places where people live, learn, work, and play [that] affect a wide range of health risks and outcomes” (CDC, “Social Determinants of Health: Know What Affects Health”). Examples of Social Determinants of Health include access to proper nutrition, ability to get an education, disparities in healthcare and the income gap.

Social Determinants of Health underlie preventable disparities in health status and disease outcomes. Poorer health outcomes are often the result of the interaction between individuals and their social and physical environments. Policies that result in changes to these environments can affect entire populations over time, while also helping people to change their individual behavior.

What Can We Do?

The Office of Disease Prevention and Health Promotion’s Project, Healthy People 2020, lays out five key areas that we must evaluate to address adverse Social Determinants of Health:

1. **Economic Stability** – we must reduce the number of those living in poverty by providing more and better employment opportunities.

2. **Education** – we must focus on early childhood education and development that will support better language and literacy skills and raise high school graduation rates.

3. **Social and Community Context** – we have to work to bring down rates of negative community factors (ex. discrimination and incarceration) and raise rates of social cohesion and civic participation.

4. **Health and Healthcare** – we need to better peoples’ access to healthcare (including primary care), as well as improving health literacy.

5. **Neighborhood and Built Environment** – we need to drive crime and violence out of neighborhoods while improving environmental conditions and access to quality housing.

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**References**


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**Figure 1.** Within Delaware, there are many factors (family income, education and racial or ethnic group) that can impact children’s general health status. As shown in the graph, children in less-advantaged groups and families appear to be less healthy than those with greater advantages. Source: Delaware: Gaps in Children’s Health Status. (2008). In Robert Wood Johnson Foundation: Commission to Build a Healthier America. Retrieved October 2, 2017, from commissionhealth.org
Childhood Trauma & Lifelong Impact on Health

Kalyn McDonough, Graduate Research Assistant
Partnership for Healthy Communities

Adverse Childhood Experiences and Childhood Trauma

Adverse childhood experiences (ACEs) are stressful or traumatic experiences including:

- Physical Abuse
- Sexual Abuse
- Emotional Abuse
- Neglect
- Witnessing Violence in the home
- Substance Abuse by a Caretaker
- Parental Divorce
- Incarceration of a Family Member

Lifelong Impact on Health

Childhood ACEs have been found to have a lifelong impact on health, and the higher an individual’s ACE “score” the greater the health risk. This includes health risks such as suicide, substance abuse, cancer, heart disease and more (CCHD, 2015).

The experiences and development of children matter, and they play a significant role in their health across a lifetime. We can have a positive impact on the health of youth through:

• preventative measures and early detection of ACEs
• support and protection against the lasting negative impacts of high exposure to trauma

Learn More

To learn more check out the references below or watch the TedMed talk by Dr. Nadine Burke Harris “How childhood trauma affects health across a lifetime.”

References

Center Child and Human Development. (2015). Who needs to pay attention to the ACEs study? Retrieved from https://georgetownta.wordpress.com/2015/03/05/who-needs-to-pay-attention-to-the-ace-study/


Income and Health Disparities

Laura McCarver, Exercise Science and Women’s Studies Double Major

Income and Health

According to the State of Delaware Community Health Status Assessment (CHSA) published in 2013, “Quality of life and health status are intrinsically linked to economic, income and educational attainment of Delaware residents” (DHSS, 2013, p. 7). Below are some of the ways that income and health outcomes are linked.

Spotlight

Level of income can dictate access to:

• Health-related resources (doctors’ appointments, medication, insurance)
• Nutrition (fruits and vegetables, low-fat options)
• Housing (environmental location, quality)
• Education (no degree vs. high school vs. college)

People who earn a higher income have lower health risks and better health outcomes. Figure 1 shows a higher median household income in New Castle County in 2015 than in Sussex County. That same year, the prevalence of diabetes was 11.8% in Sussex County as compared to a prevalence of 8.5% in New Castle County, as shown in Figure 2. Diabetes is related to a variety of health risks (including sedentary lifestyle, obesity, family history and age), which can be linked to income. Diabetes increases the risk of other health issues including nerve damage, kidney disease and stroke.

Conclusions

Income can pose barriers to health. According to Aron, et. al., “programs and policies that improve the income and the income-generating potential of individuals, families, and entire communities are powerful tools for improving health, narrowing health inequalities, and containing spiraling health care costs” (p. 10). It is crucial to take steps toward improving the financial situations of families and individuals in Delaware in order to improve the health of the Delaware population.

References


Introduction

Poor quality, unaffordable or inaccessible housing can have a wide range of negative impacts on both physical and mental health. However, stable, safe and affordable housing not only protects families from the adverse impacts of poor housing, but it also provides families with a safe and reliable place to practice healthy habits.

Connections Between Housing and Health

- Homelessness can lead to crowding and unsanitary conditions that are associated with infectious diseases.
- A home acts as a place to store medication, sleep and cook meals.
- Unaffordable housing (over 30% of income) is associated with higher rates of overall poor health, stress, depression, inability to fill prescriptions and inability to abide by the recommendations of medical professionals.
- People living in unaffordable housing spend a smaller percentage of their income on food and healthcare because unaffordable housing forces them to reduce spending on other measures.
- Affordable housing opportunities can benefit the physical and emotional health of domestic abuse victims by allowing them to escape the abuser without the fear of homelessness.
- Mildew, mold and mites worsen asthma.
- Unsafe housing structures can lead to injury especially among the elderly who often need housing modifications to prevent falls (Maqbool et al., 2015).

References


What Can We Do?

- Engage the community in projects and healthy housing education.
- Continue and expand healthy housing initiatives.
- Use new housing projects to encourage mixed-income housing.
- Create partnerships between health and housing.
- Turn vacant lots into affordable housing (Scally et al., 2017).
Transportation and Health

Rahsel Holland, English and Public Policy Double Major

Introduction
• Public transportation affects air pollution, body weight, traffic injuries and mobility for non-drivers.
• In 2013, transportation contributed to more than half of the carbon dioxide and nitrogen oxide into our air (Union of Concerned Scientists, 2014).
• Vehicle accidents kills more than 1,300 children each year (National Center for Injury Prevention and Control, 2010).
• Only 48% of adults get enough aerobic physical activity (Center for Disease Control and Prevention, 2012).
• Together all states would save $5.2 billion a year in state injury-related costs by increasing seat belt usage to 90% nationwide (National Center for Injury Prevention and Control, 2010).

What is Delaware Doing?
• Operation Lifesaver is a program helps to make people more aware of safety signs around railroads (http://bit.ly/2ieD1UN).
• RideShare pairs connects people to carpool, and anyone who signs up is guaranteed a free ride home if they should come to need it (http://bit.ly/2wZpfb4).
• Safe Routes to School program that encourages children to walk and bike by providing safe routes for less parental concern (http://bit.ly/2k770CD).
• Law enforcement advertisements “Click it or Ticket” since wearing a seat belt decreases risk of being seriously injured or killed by 50% (http://bit.ly/2xKyMas).

Conclusion
Delaware has implemented plans to improve its transportation system, an thus promote the health of its residents. The state could further these plans by taking the next steps to educate citizens about the impact of transportation and health, spread the word about newly implemented programs, and support residents in utilizing those programs.

Next Steps
• Spreading awareness of how transportation impacts the health of the public.
• Utilizing the Complete Streets movement that designs streets and roadways to safely accommodate travelers of all ages and abilities (http://bit.ly/2yrFPnC).
• Educating the public about existing programs, through advertising and marketing, could help increase the utilization of such programs.

Figure 1. Walkable, bikable transit-oriented communities are associated with healthier populations that have the factors listed above. Robert Wood Johnson Foundation. (2012, October 25). [Health in Communities with Better Transportation Options] [Infographic].

References


Sexual Orientation and Health Disparities

Laura McCarver, Exercise Science and Women’s Studies Double
Major

Sexual Orientation and Health

In Delaware, the LGBTQ+ community experiences disadvantages with a variety of socioeconomic factors. These individuals are more likely to be unemployed, less likely to have a college education and more likely to earn an income less than $24K. All of these socioeconomic disadvantages put LGBTQ+ individuals at risk for poor health. One particular challenge facing the health of the LGBTQ+ population is lack of research.

Spotlight

• “LGB adults... experience more mood and anxiety disorders, more depression, and an elevated risk for suicidal ideation and attempts” (Committee, 2014, p.5).
• LGB youth make up a disproportionate number of the homeless youth population (Committee, 2014, p. 161).
• “LGBT people are frequently the targets of stigma, discrimination, and violence because of their sexual- and gender-minority status” (Committee, 2014, p. 5).
• LGBTQ+ individuals are more likely to seek treatment for mental health and substance abuse.

Lack of Research

Research lacks in several areas, including studies focused on bisexual and transgender people; LGBTQ+ subpopulations, especially racial and ethnic groups; children and LGBTQ+ elders.

Conclusions

The LGBTQ+ community makes up 4% of the Delaware population, and this number is growing every year (LGBT Data and Demographics). Because of the stigmas surrounding the community, LGBTQ+ individuals have a special set of health needs, much of which manifests in mental health disparities. While we do know many of the issues that pose barriers to health for sexual and gender minorities, it is crucial to conduct more research in order to understand the full picture. In addition to completing more research, addressing the relevant socioeconomic and cultural factors will help to diminish health disparities for the LGBTQ+ population.

References

LGBT Data and Demographics. (2016, May). Retrieved williamsinstitute.law.ucla.edu
Hispanic and Latino Health

Melanie Shpigel, Undergraduate Student

Introduction
Hispanic citizens represent about 10% of the population in Delaware. In the United States, Hispanics are the largest minority group, representing an estimated one of every six people.

Methods
I conducted a literature review of Hispanic and Latino health, including references from the Center for Disease Control (CDC) and the Christiana Hospital.

Health Disparity Examples
Hispanics represent less than 20% of U.S. population, yet they account for ~25% of new HIV diagnoses (HIV/AIDS, 2017).
Hispanics have 23% more obesity than non-Hispanic whites.
Hispanics have a 50% greater chance of dying from diabetes or liver disease than non-Hispanic whites (Vital Signs, 2015.)

Conclusions
• Social determinants of health can have unequal impacts on Hispanics, as compared to the majority group non-Hispanic whites. Limitations include poverty, migration, language and cultural barriers.
  • 1 in 4 U.S. Hispanics lives below the poverty line.
  • 1 in 3 U.S. Hispanics has poor English language skills (Vital Signs, 2015).
• Cultural norms, such as smoking and dietary preferences, influence behavior and must be considered in developing interventions.
• Lack of health insurance, transportation to medical facilities and precautionary measures contribute to poor health: Hispanics have 28% less colorectal screening compared to non-Hispanic whites (Vital Signs, 2015).
• Hispanics born outside of the U.S. often have better overall health compared to those born in the U.S. Cultural barriers, dietary habits and economic differences may factor into these disparities.

Strategies to Promote Hispanic and Latino Health
• Allocate funding annually to assist minority populations with HIV education and testing.
• Provide interpreters and translate resources into Spanish.
• Hire trained professionals in healthcare facilities that are knowledgeable of minority cultures and are able to effectively communicate with patients
• Provide professional development training on cultural competencies and minority health disparities.

References
Racial Variance in Cerebral Palsies and Co-morbidities in Children: A Large Cohort Evidence

Introduction
Cerebral palsy (CP) is the most common form of chronic motor dysfunction in children affecting 2–3 per 1000 live births.6 CP results from an injury or malfunction of the grey matter of the brain7 while the brain is still in the early developmental stage. Previous studies have assessed differences in the incidence of cerebral palsy by health disparities indicators. Very few studies have focused on the co-morbidities associated with cerebral palsy4 and how racial and ethnic differences may have an effect on those co-morbidities. To our knowledge, there have been no studies conducted on the U.S. children population regarding co-morbidities assessment in children.

Objectives
Aims
• To determine the prevalence of cerebral palsy among children aged 2–17 years
• To examine co-morbidities in this sample comparing those with and without cerebral palsy
• To assess racial/ethnic disparities in cerebral palsy co-morbidities and to determine whether or not social determinants influence the variability

Null Hypothesis
• There are no differences in co-morbidity prevalence comparing children with and without cerebral palsy.
• The racial disparities in cerebral palsy co-morbidities are not explained by other social determinants of health.

Methods
• Study Design: Atypical case/non-case design
• Data Source: National Survey of Children’s Health (2011–2012)
• Study Variables: Cerebral palsy, race/ethnicity, sex, age, body mass index (BMI), birth weight, region, poverty, parental education, neighborhood factors, health insurance, joint impairment, learning disabilities, intellectual disability, vision loss, brain injury, speech impairment, hearing loss, seizures, asthma and autism
• Statistical Analysis:
  - Chi-Squared was used to generate the frequency and percentages of study variables as well as determine if there is a relationship between CP and each categorical variable.
  - Univariate Logistic Regression Model was used to test the hypothesis by examining the association between CP and each co-morbidity individually.
  - Multivariable Logistic Regression Model was used to test our hypothesis by examining the association between CP, all co-morbidities, and social determinants, focusing on race.

Figure 1. Atypical case/non-case step-by-step process of “big data” reduction performed in this study to obtain an efficient sample of non-cases, n=1,238.

Table 1. Characteristic Study of Cerebral Palsy

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cerebral Palsy</th>
<th>Without Cerebral Palsy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race/Disability</td>
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<td></td>
</tr>
<tr>
<td>White</td>
<td>167</td>
<td>0.36</td>
</tr>
<tr>
<td>Hispanic</td>
<td>25</td>
<td>0.51</td>
</tr>
<tr>
<td>Black</td>
<td>35</td>
<td>0.51</td>
</tr>
<tr>
<td>Multi-Racial/Other</td>
<td>25</td>
<td>0.51</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>138</td>
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</tr>
<tr>
<td>Female</td>
<td>122</td>
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</tr>
<tr>
<td>Age</td>
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<tr>
<td>2-5 years</td>
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</tr>
<tr>
<td>6-11 years</td>
<td>101</td>
<td>0.36</td>
</tr>
<tr>
<td>12-17 years</td>
<td>118</td>
<td>0.38</td>
</tr>
<tr>
<td>Body Mass Index</td>
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<td></td>
</tr>
<tr>
<td>Less than 5th percentile</td>
<td>24</td>
<td>0.18</td>
</tr>
<tr>
<td>5th percentile to &lt; 85th percentile</td>
<td>16</td>
<td>0.27</td>
</tr>
<tr>
<td>85th percentile to &lt; 95th percentile</td>
<td>24</td>
<td>0.43</td>
</tr>
<tr>
<td>Birth weight</td>
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<td></td>
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<td>Extremely low</td>
<td>80</td>
<td>6.86</td>
</tr>
<tr>
<td>Low</td>
<td>57</td>
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</tr>
<tr>
<td>Normal</td>
<td>123</td>
<td>0.18</td>
</tr>
<tr>
<td>Region</td>
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<td></td>
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<tr>
<td>Northeast</td>
<td>43</td>
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</tr>
<tr>
<td>Midwest</td>
<td>60</td>
<td>0.33</td>
</tr>
<tr>
<td>South</td>
<td>117</td>
<td>0.41</td>
</tr>
<tr>
<td>West</td>
<td>79</td>
<td>0.47</td>
</tr>
<tr>
<td>Income</td>
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<tr>
<td>0-99.9% PFL</td>
<td>52</td>
<td>0.50</td>
</tr>
<tr>
<td>100-199% PFL</td>
<td>54</td>
<td>0.42</td>
</tr>
<tr>
<td>200-399% PFL</td>
<td>79</td>
<td>0.54</td>
</tr>
<tr>
<td>400% or greater PFL</td>
<td>76</td>
<td>0.28</td>
</tr>
<tr>
<td>Education of mother</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than high school</td>
<td>15</td>
<td>0.30</td>
</tr>
<tr>
<td>High school</td>
<td>25</td>
<td>0.42</td>
</tr>
<tr>
<td>More than high school</td>
<td>165</td>
<td>0.32</td>
</tr>
<tr>
<td>Education of father</td>
<td></td>
<td></td>
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<tr>
<td>Less than high school</td>
<td>12</td>
<td>0.25</td>
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<tr>
<td>High school</td>
<td>57</td>
<td>0.44</td>
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<tr>
<td>More than high school</td>
<td>116</td>
<td>0.28</td>
</tr>
<tr>
<td>Disability/17%</td>
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<td></td>
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<td>Yes</td>
<td>222</td>
<td>0.34</td>
</tr>
<tr>
<td>No</td>
<td>47</td>
<td>0.40</td>
</tr>
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</table>

Table 2. Multivariable Association Between Cerebral Palsy and Co-Morbidities

<table>
<thead>
<tr>
<th>Variable</th>
<th>Adjusted OR (95% CI)</th>
<th>99% CI</th>
<th>p-value</th>
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</thead>
<tbody>
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<td>Race</td>
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<td></td>
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</tr>
<tr>
<td>White</td>
<td>1.00</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.70</td>
<td>0.54 – 0.85</td>
<td>0.40</td>
</tr>
<tr>
<td>Black</td>
<td>1.04</td>
<td>0.97 – 1.03</td>
<td>0.07</td>
</tr>
<tr>
<td>Multi-Racial/Other</td>
<td>0.57</td>
<td>0.49 – 0.65</td>
<td>0.04</td>
</tr>
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<td>Joint Disorder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.99</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>Yes</td>
<td>1.00</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>Seizure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>0.59</td>
<td>0.42 – 0.73</td>
<td>0.08</td>
</tr>
<tr>
<td>Yes</td>
<td>0.49</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>Intellectual Disability</td>
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<td></td>
<td></td>
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<td>Referent</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>Yes</td>
<td>1.52</td>
<td>1.08 – 2.13</td>
<td>0.02</td>
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<tr>
<td>Learning Disability</td>
<td></td>
<td></td>
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<td>No</td>
<td>Referent</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>Yes</td>
<td>0.73</td>
<td>0.44 – 1.20</td>
<td>0.02</td>
</tr>
<tr>
<td>Brain Injury</td>
<td></td>
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</tr>
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<td>No</td>
<td>Referent</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>Yes</td>
<td>1.00</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>Speech Impairment</td>
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<td></td>
<td></td>
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<tr>
<td>No</td>
<td>Referent</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>Yes</td>
<td>0.66</td>
<td>0.48 – 0.93</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Inferences
• The racial differences in cerebral palsy prevalence revealed in this study are consistent with that found in literature of prior studies.
• We can infer that the racial variance in cerebral palsy prevalence is not strictly driven by social and environmental determinants of health.
• Overall, this study found that children diagnosed with cerebral palsy have increased odds of developing a number of co-morbidities, such as joint disorder, seizures, intellectual disability, learning disability, and speech impairment.

References
5. http://dx.doi.org/10.4103/1817-1745.205022

Acknowledgements
We would like to thank the Nemours Office of Health Equity and Inclusion and A.J. D’Angelo Hospital for Children for the opportunity to research this topic; Adrienne Wallace, April Agunan and all of the fellows (Bogomolna Ogunde, Prachi Chavan, Valeria John) for the invaluable mentorship and guidance, as well as the Health Equity Summer Scholars (Tjjer B Hale, Austin Luna, Mche Musawida, Mark Tenczo, Carter Thompson, Kristen Neal, Casey (Srinivasan and Bernardus Williams) and my mentor, Kamyla Ramos, for their continuous support.
Evidence for the Potential Impact of Meditation Interventions on Foster Care Children

Mickey Nguyen, Neuroscience Major

Introduction
Mindfulness meditation, which is the training of the mind to be present, has helped thousands of people transform their lives in the midst of physical and psychological suffering.

Although extensive research shows that mindfulness-based stress reduction (MBSR) programs can reduce symptoms of depression, hostility, and stress, studies examining its impact specifically on foster care children have been scarce, making the practicality of implementing MBSR programs with this population problematic.

Further research for such populations could potentially influence counseling services offered to children who are at a higher risk for developing mental disorders.

Purpose
Gather evidence that meditation interventions would be effective in reducing negative emotions and behaviors in foster kids.

Methods
Articles were identified by searching with keywords “meditation or mindfulness studies” and “children.”

Fifteen papers met the following inclusion criteria: (1) children under 18 years old and (2) subjects showing symptoms of depression, anxiety, or other psychosocial difficulties.

Results
Literature search resulted in a total of 15 publications for full-text assessment.

All researchers reported enhanced cognitive functions such as attention, memory, and executive function.

An important conclusion that can be drawn from the reviewed neuroscience and brain imaging studies is that meditation interventions for foster care children are feasible.

In summary, meditation benefits children’s emotional, mental, and intellectual development through:

- Improved focus and attention
- Better ability to manage emotions
- Reduced disruptive behaviors
- Decreased anxiety and ADHD behaviors
- Better acceptance of difficult experiences
- Greater calmness and resilience
- Enhanced social skills
- Improved motivation and self-esteem

Conclusion
As predicted, all reviewed papers suggest that MBSR appears to be effective in supporting emotional and social learning and preventing mental health problems.

MBSR can be a translatable short-term, non-invasive, and socially valid intervention for foster care children who demonstrate similar complications as youth population in the reviewed studies.

Future research needs to investigate whether or not beneficial effects of mindfulness are comparable to other foster care counseling methods.

Acknowledgements
I would like to thank the Office of Undergraduate Research, the Summer Scholars Program, and my faculty advisor and sponsor, Dr. Alan Fox.

References


Fifty-year-old meditators had the same amount of gray matter as 25 year olds, indicating a reduction in age-related cognitive decline.

Meditation alters the structure of the brain to improve thought and feeling (Sara Lazar, 2005):

- Amygdala (the brain’s fight or flight center) shrinks
- Pre-frontal cortex (concentration, awareness, decision-making) becomes thicker
- Hippocampus (memory and learning) becomes thicker
- Anterior Cingulate Cortex (self-regulatory processes and attention monitoring) becomes thicker
The Specificity of Relations Between Victimization and Internalizing Symptoms in Adolescents

Sophia Conners

Introduction
Between 10–20% of children report being bullied (Nansel et al., 2001; Vallaincourt et al., 2010). Victimization is associated with a host of negative outcomes.

This study examined relations between:
• Three forms of victimization (physical, verbal, relational) and internalizing symptoms
• Victimization and two types of internalizing symptoms (depressive, anxious)

Hypotheses
• All three forms of victimization will relate to internalizing symptoms
• Both types of internalizing symptoms will relate to victimization

Method
• 150 7th–8th grade adolescents and their caregivers filled out questionnaires assessing peer victimization and internalizing symptoms
• Gender
  • 57% female
  • 43% male
• Race
  • 69% White/Caucasian
  • 13% Black/African American
  • 9% Asian
  • 7% Mixed/Other
  • 1% Native Hawaiian/Pacific Islander
• Ethnicity
  • 87% Not Hispanic/Latino
  • 12% Hispanic/Latino

Measures
• Valid and reliable measures were used to tap into these constructs.
• Parent and child reports of the constructs were highly correlated. For this reason, we decided to standardize and average scores across the two reporters to create an aggregate variable for each construct.
• We also computed bivariate correlates among all pairs of these aggregate variables. All correlations were statistically significant, with the exception of the correlation between physical victimization and anxious symptoms.

Results

<table>
<thead>
<tr>
<th>Predicted Variable</th>
<th>Predictor Variables</th>
<th>B</th>
<th>SE</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depressive Symptoms</td>
<td>Physical Victimization</td>
<td>-.04</td>
<td>.09</td>
<td>-.46</td>
</tr>
<tr>
<td></td>
<td>Verbal Victimization</td>
<td>.30</td>
<td>.08</td>
<td>3.58**</td>
</tr>
<tr>
<td></td>
<td>Social Victimization</td>
<td>.15</td>
<td>.08</td>
<td>1.91+</td>
</tr>
<tr>
<td>Anxious Symptoms</td>
<td>Physical Victimization</td>
<td>-.11</td>
<td>.09</td>
<td>-1.13</td>
</tr>
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<td>.15</td>
<td>.09</td>
<td>1.66</td>
</tr>
<tr>
<td></td>
<td>Social Victimization</td>
<td>.15</td>
<td>.08</td>
<td>1.80+</td>
</tr>
<tr>
<td>Overall Internalizing Symptoms</td>
<td>Physical Victimization</td>
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<td>.12</td>
<td>-1.11</td>
</tr>
<tr>
<td></td>
<td>Verbal Victimization</td>
<td>.34</td>
<td>.12</td>
<td>-2.79**</td>
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<td></td>
<td>Social Victimization</td>
<td>.24</td>
<td>.11</td>
<td>2.17**</td>
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</table>

Discussion
Verbal and social victimization, but not physical victimization, predicted the two types of internalizing symptoms and overall internalizing symptoms. Depressive symptoms, but not anxious symptoms, predicted the three types of victimization and overall victimization. The study sample had a low frequency of reporting for physical victimization. Future studies could focus on specific subtypes of anxiety, possibly more prone to victimization.
Dance and Parkinson’s Disease

Tessa Brower-Walsh and Aleya Smith

Introduction
Parkinson’s Disease (PD) is a progressive neurodegenerative disease that directly affects movement. The symptoms of PD, which include body tremors, body stiffness, impaired balance, and impaired gait, often make simple tasks extremely difficult.

While there is no known cure for PD, physical exercise has been shown to combat the negative symptoms of the disorder. Dance for PD is a program founded in New York that offers dance classes as the means for such exercise.

Aim of Research
• Discover if dance is a suitable intervention for people with Parkinson’s Disease.
• Connect our respective majors (neuroscience and exercise science) to dance in a productive way.

Methods
We assist in a Dance for PD class taught by Marion Hamermesh at the Hockessin Athletic Club in Hockessin, Delaware. In a typical class we participate in the given exercises and help whenever necessary. We observe the progress of the participants and the progression of the class as a whole on a weekly basis. We then take our class experiences and interpret our findings independently.

Conclusions
Music serves as an external cue for strategic movement that has been known to improve gait. The use of varying lower and upper-body exercises serves as a cognitive movement strategy for improved weight transfer. Seated and across-the-floor steps exercise the students’ response to perturbations enhancing balance. The length and consistency of the class trains joint mobility and muscle power through every exercise.

Ultimately, we found that not only does dance address key symptoms of PD, but it serves as an enjoyable and socially engaging experience for the dancers and their families. All of these components support our idea that dance is a suitable intervention for people with PD.

Future work
Testing other physical exercise practices on individuals with PD and comparing self reported mental health and suppression of symptoms to our findings.

Acknowledgements
Thank you to Marion Hamermesh for allowing us to participate in her class. “Dance for PD.” Dance for PD RSS, danceforparkinsons.org/
“Understanding Parkinson’s.” Parkinson’s Foundation, parkinson.org/understanding-parkinsons.