

Improving Physical Activity Among Latinx Adolescents

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INTRODUCTION

Physical activity (PA) is bodily movement from muscle contractions that results in energy expenditure above basal levels (Fletcher et al., 2018). Research indicates this includes, but is not limited to, yard work, house chores, walking to and from work or school, running, and leisure activities. Of particular interest to public health researchers is moderate to vigorous physical activity (MVPA), which is typically intentional, repetitive, and structured exercise requiring a greater amount of physical exertion and intensity than regular physical activity (Fletcher et al., 2018). According to Chaput et al. (2020), the World Health Organization (WHO) recommends 60 minutes of MVPA every day, of which three days should incorporate muscle and bone strengthening exercises. The authors also indicate while the average of 60 minutes per day results in many benefits, even more benefits are attained when adolescents participate in over 60 minutes of MVPA per day.

One study by Fruh (2017) showed depression, decreased cognitive functions, and lower academic outcomes are linked to a lack of MVPA. In addition, obesity, which is a result of poor nutrition and/or lack of MVPA, is directly associated with comorbidities such as “cardiovascular disease (CVD), gastrointestinal disorders, type 2 diabetes (T2D), joint and muscular disorders, respiratory problems, and psychological issues,” (Fruh, 2017). Conversely, cardiorespiratory fitness, bone strength, muscular fitness, and cardiometabolic health are associated with higher levels of MVPA (Chaput et al., 2020). In the United States, CVD remains the leading cause of death even though health experts have identified PA as one of the major modifiable risk factors; unfortunately, this has not affected the PA levels of the United States population (Fletcher et al., 2018). These studies indicate the effects of not participating in enough physical activity can be detrimental to one’s health, and in some cases, deadly.

Research shows in order to increase PA in the population, healthy habits must be created at a young age (Reinehr, 2018). According to Reinehr (2018), adolescents with obesity and comorbidities usually carry these conditions into adulthood and are more likely to have children with the same conditions; as a result, both generations can face premature death. One study found adolescents with obesity are at a 50% risk of becoming obese adults, compared to a 10% risk for adolescents without obesity (Fruh, 2017). The authors indicate adolescents with low levels of PA, specifically, face an increased risk of asthma, nonalcoholic fatty liver disease, poor dental health, gastroesophageal reflux disease, attention deficit hyperactivity disorder,

anxiety, depression, poor self-esteem, and problems with sleeping. According to the same study, boys can have delayed puberty, while girls may face puberty early along with a greater risk of hyperandrogenism and polycystic ovary syndrome. Rates of obesity and overweight in adolescents have exponentially increased over the past few decades, resulting in an increase of the many comorbidities (Vasquez et al., 2021). The research by Vasquez et al. (2021) shows creating and developing healthy PA habits in adolescents can decrease the prevalence of obesity, with its many comorbidities, in the overall population.

According to a study by Vasquez et al. (2021), the Latinx community, especially adolescents, are at an increased risk due to poor neighborhood safety, access to recreational areas, support and role modeling from family, and school policies related to physical education. Socioeconomic status influences many of these factors, with 23% of adolescents in poverty being obese, compared to only 14% of those not in poverty (Escaron et al., 2020). A study by Evenson et al. (2019), found Hispanic adolescents only engaged in 25 minutes of moderate activity per day and only 10 minutes of vigorous activity per day, which is approximately 25 minutes under the recommended amount of one hour per day. To further support this finding, in 2015-2016, Latino adolescents had the highest prevalence of overweight or obesity compared to other racial and ethnic groups, with 46% reporting overweight or obese (Zhang et al., 2019).

The Healthy People 2030 Initiative is attempting to improve health, fitness, and quality of life through regular physical activity (Office of Disease Prevention and Health Promotion, n.d.). Among many objectives for the general public, there are various objectives pertaining specifically to adolescents, with an overarching goal of decreasing the proportion of adolescents with obesity. The objectives include increasing the number of adolescents who participate in at least sixty minutes of physical activity each day, including three days of muscle strengthening activities per week, and daily aerobic activity. Another Healthy People 2030 objective is to increase the number of adolescents who play sports by increasing access to sports facilities and sports programs for all children in hopes of increasing physical, social, economic, and academic outcomes. Some of the more specific objectives are to increase the amount of adolescents who partake in daily physical education at school and increase the number of adolescents who walk or bike to get places by creating a stronger and more developed built environment. The objectives currently guide the public health efforts to decrease adolescent obesity and increase levels of physical activity.

THEORY

According to Glanz and Bishop (2010), behavior theory is an integral part of researching a behavior, determining its influences, and creating an intervention model to change the behavior. They indicate the multitude of theories allows health professionals to approach each problem with a broad scope then choose the theory which can best create a behavior change. The authors explain two subcategories of theory, explanatory theory and change theory, which are different yet interdependent of one another. Elaborating, they say explanatory theory hypothesizes the reasoning behind one's behavior and must be understood in order to develop and employ change theory, which utilizes the reasoning behind one's behavior in order to create a change. They concluded behavioral theories, which are composed of constructs, hypothesize and predict the relationship between variables and behaviors and strive to find why certain behaviors take place in order to create an intervention strategy.

Theory of Planned behavior

The Theory of Planned Behavior (TPB) was originally known as the Theory of Reasoned Action (TRA) and was proposed by Martin Fishbein in 1980 (Simons-Morton & Lodyga, 2020). According to Simons-Morton & Lodyga (2020), Icek Ajzen and Fishbein worked together in the following years to develop the Theory of Planned Behavior, which is differentiated from the TRA by the addition of perceived behavioral control and its emphasis on intention. According to LaMorte (2022b), the first of four constructs, perceived behavioral control, is the individual's belief about the environment and whether or not the individual has control over the behavior, considering the environmental factors. The second construct, attitude, is shaped by the beliefs one has about the outcome of a behavior and the behavior itself. The third construct, subjective norms, is the perceived social expectations regarding the behavior. These three constructs are all intertwined to form the fourth construct, intention. Intention is the act of planning and deciding to partake in, or abstain from, a certain behavior (Pasi et al., 2021). According to *Hispanic Health Care International* (2005), intention has a direct relationship with behavior and is influenced by attitudes, norms, and perceived power and control. Riley et al. (2014) stated an individual will, or is more likely to, participate in a behavior if they feel the environmental factors favor the behavior. In addition, they are more likely to participate if they have high self-efficacy, believe the behavior is beneficial and enjoyable, believe their peers value the behavior, and intend to participate in the behavior.

A study was conducted on a group of 550 Latinx adolescents from north Philadelphia to examine the outcomes of an intervention designed to reduce the risk of sexually transmitted HIV in the students (Eakin et al., 2005). The study was based around the Theory of Planned Behavior, focusing on the attitudes, intentions, knowledge, norms, and beliefs not only of sexual behavior, but of risk behaviors such as physical activity. It also studied the effects of acculturation, which is the adopting of American culture, beliefs, and values, as a factor that influences PA (Schumann et al., 2020). An analysis was conducted using this data to determine the effects of the TPB constructs on physical activity levels and intention in Latinx adolescents. The constructs were assessed through a pre-intervention questionnaire with likert scale-based questions about PA intentions, attitude toward PA, knowledge of PA, PA behavior, and acculturation level. This assessed predictors of PA among Latinx adolescents using the Theory of Planned Behavior. The results of the study found that for boys, increases in attitude and knowledge were related to an increase in intention to partake in PA. For girls, increases in attitude, days of activity, and knowledge had a positive correlation to intention.

In the study and analysis by Eakin et al. (2005), many gender differences were found, including attitude towards PA, with 76.7% of boys believing regular PA was a good or very good idea, compared to 65.0% of girls. Boys were also more likely to have intentions to participate in PA in the next 3 months, with 66.3% of boys compared to 53.7% of girls. In addition, boys had more knowledge regarding the benefits of PA, with 49.4% demonstrating correct answers to PA knowledge questions, and only 31.9% of girls answering correctly. This remained consistent with the reported levels of PA in the past 7 days, with 54.6% of boys reported high levels of activity, compared to only 34.4% of girls. For both boys and girls, attitude was the strongest predictor for PA intention. This specific study did not implement an intervention to test the practicality of this theory in increasing PA among Latinx adolescents, but it did verify a relationship among the constructs of TPB and intention among Latinx adolescents. The authors concluded that it is increasingly vital to create a positive attitude regarding PA among Latinx adolescents by educating them on the benefits of PA and different forms of PA they find enjoyable.

Social Cognitive Theory

Albert Bandura first developed the Social Learning Theory (SLT) with the key principle of learning by the observation of others (LaMorte, 2022a). LaMorte (2022a) said it later

developed into the Social Cognitive Theory (SCT) at the addition of many other constructs including self-efficacy, reciprocal determinism, behavioral capability, observational learning, reinforcements, and expectations. Gao (2012) explained the constructs. Self-efficacy, the belief in one's own capacity to complete a goal, can be increased by completing the goal oneself or watching someone else complete the goal. Learning by watching someone else is known as observational learning. However, the actual ability of an individual to complete a goal based on knowledge and skills is known as behavioral capability. Gao adds, saying reciprocal determinism is the relationship between person, environment, and behavior; each of these factors, if affected, also has the ability to impact another factor. Reinforcements are an important factor in someone's likelihood to participate in a behavior because they either encourage or discourage a behavior, depending on if they are positive or negative. Oftentimes shaped by past experiences, expectations are determined by the consequences of a behavior one expects to endure and the value the individual places on the consequence (Gao, 2012).

One study used the SCT to design an intervention program for 120 Latinx children from an disadvantaged urban elementary school (Gao, 2012). The students were given a survey assessing self efficacy, outcome expectancy, social support, and physical and social environment. Each of these were asked about using subscales and Likert scales. Examples of such subscales include the subscales for social support: parental social support, parental encouragement, peer support, and teacher support. The students were then asked to wear an accelerometer on their left hip for the following seven days, which tracked their activity. The data from both the survey and the accelerometer readings were then evaluated at the end of the week to determine the impact of the SCT constructs on PA. It was concluded that self-efficacy has a significant impact on an individual's PA levels, followed by social support. However, environmental factors and outcome expectancy did not have a significant correlation with levels of PA. Researchers were not surprised by the lack of impact from outcome expectancies because adolescents often do not understand the health consequences of sedentary behavior. The author concluded through education, observational learning, and encouragement, self-efficacy can be increased among Latinx adolescents and PA can improve.

INTRAPERSONAL FACTORS

Intrapersonal factors, such as knowledge, attitudes, behavior, self-concept, skills, and developmental history, have a tremendous influence on health behavior (American College

Health Association, n.d.). Included in intrapersonal factors is demographics, such as socioeconomic status, race and ethnic identity, and gender (Simons-Morton & Lodyga, 2020). Multiple studies have found non-Latinx Whites are significantly more physically active than their Latinx counterparts (Perry et al., 2011). These differences are seen since early childhood, with Latinx preschoolers of age four reporting significantly less PA than non-Latinx White students (Olvera et al., 2010). This difference continues on into adolescence, as seen with the high percentage of Latinx adolescents that do not participate in the recommended levels of moderate to vigorous physical activity (MVPA), as reported by Evenson et al. (2019). To highlight this issue, in 2015-2016, Latinx children and adolescents were the most obese in contrast to other major ethnic groups, with 46% reporting to be overweight (Zhang et al., 2019).

Among Latinx adolescents, other intrapersonal factors have a large impact on levels of MVPA. Included in these factors is gender, which is one of the biggest indicators of MVPA among Latinx adolescents (Perry et al., 2011). Perry et al. (2011) found boys are much more likely than girls to reach recommended levels of MVPA. Supporting this, Olvera et al. (2010), found Latinx girls are less likely to participate in organized sports than Latinx boys. Participation in organized sports is correlated with higher levels of satisfaction, enjoyment, and positive past experiences because it creates a more positive attitude towards PA, resulting in higher levels of MVPA (Perry et al., 2011). Other intrapersonal factors, such as emotions and mental functions, also affect likelihood of PA. In one study performed on low-income Latinx students, some students, especially girls, reported feelings of depression, sadness, high stress, and anxiety resulting in low motivation to work out (Vasquez et al., 2020).

Since many members of the Hispanic community in America are from first or second generation families, acculturation is a factor of interest (Schumann et al., 2020). According to the *Journal of Applied Research on Children* (2010), Hispanic children with foreign-born parents were more likely to report low levels of sports participation and high inactivity levels than Hispanic children with parents born in the United States. A correlation was also found between Spanish speaking and non-Spanish speaking Hispanic adolescent girls, with non-Spanish speaking girls more likely to participate in PA. Some explanations for this can be attributed to findings from a study conducted by the *Journal of Nutrition Education and Behavior* (2018), which interviewed Hispanic parents of young children and found that parents

strongly influence physical activity behaviors in young children, which are carried through adolescence. The study also concluded Hispanic parents were less likely to encourage and facilitate PA because in Hispanic culture, it is widely believed that skinny children are unhealthy and unhappy. Many parents also believed non-Hispanic White children can acclimate better to cold weather and Hispanic children do not enjoy cold weather, so there is much less MVPA participation by Hispanic children in the winter months. Another belief held by parents is that spontaneous play such as walking, recess, or playing outside is not beneficial for physical health, however, they do believe organized sports are. Yet, they feel they cannot enroll their children in organized sports due to money, transportation, and time.

Money is also considered a barrier to physical activity by many researchers. Since many Latino families are of low socioeconomic status, this is a recurring issue in regards to levels of MVPA among adolescents (Xie et al., 2018). Xie et al. (2018) found low socioeconomic status to be correlated with less resources and opportunities for physical activity, such as access to fitness centers and safe neighborhoods. They also discovered an association between low self-regulation skills and infrequent supervision and support from parents and a lack of MVPA within this population. Due to this, many of the adolescents lacked positive PA past experience, which, if obtained, would increase their levels of MVPA. In previous studies, Latina adolescents reported not participating in PA because of violence, drugs, gangs, and catcalling in their neighborhoods (Vasquez et al., 2020).

INTERPERSONAL FACTORS

Interpersonal factors are described as relationships with friends, family, and social networks that influence a behavior (Pietromonaco & Collins, 2018). According to the authors, health behaviors are found to be closely linked to these relationships because they are associated with stress relief and fulfilling the need for love and belonging. This results in a higher level of influence and makes interpersonal relationships a subject of interest to public health researchers when considering health behaviors. For adolescents, evidence supports the importance of familial relationships and dynamics in improving physical activity, which includes the cultural roles of family members, parenting style and practices, parental stress, and level of communication (Soltero et al., 2021) .

Familism, the value of strong connectedness and bonding among family members, is a cultural value that is observed consistently among Latinx families (Soltero et al., 2021). In one

study performed by Soltero et al., (2021), in depth interviews were conducted among Hispanic male and female adolescents to find out the perceived association between familial roles and relationships and physical activity. They found in Hispanic culture, the mothers assume the role of the caregiver and nurturer, while the father assumes the role of provider. Many female participants reported that their mother's responsibilities as caregiver often hindered their ability to participate in MVPA together. This was due to the mother's responsibilities of cooking, cleaning, and driving, among other caretaking duties. Females also reported that their father's role as the provider hindered their time spent exercising together. According to the authors, the cultural role of the father as the provider has put Latinx men at a much higher likelihood of working manual, long, and physically demanding jobs, which makes them unavailable and absent most of the time.

Parenting styles are determined by two factors: demandingness, or level of control, and responsiveness, or level of warmth (Linsay et al., 2018). The research states the four parenting styles are authoritarian (high demandingness and low responsiveness), authoritative (high demandingness and high responsiveness), passive (low demandingness and high responsiveness), and uninvolved (low demandingness and low responsiveness). According to the Linsay et al., (2018), Latinx families have been shown to exemplify authoritarian parenting from the father and passive parenting from the mother, with high control parenting practices. Permissive parenting was associated with higher levels of sedentary behavior, in contrast to authoritative parenting, which was associated with high levels of MVPA. The study showed that children of parents who offer instrumental support, such as transportation or enrolling a child on a team, participate in PA more than those with parents who do not offer instrumental support. This was consistent with findings from the *Padres Preparados, Jóvenes Saludables* study, which found that sons were more likely to participate in MVPA if their fathers facilitated it and also did it with them (Zhang et al., 2019). The studies reflect that positive parenting practices such as encouragement of PA, verbal affirmation and praise, engaging in PA with the child, and monitoring are all positively associated with levels of PA (Linsay et al., 2018). Likewise, negative parenting practices such as setting rules for PA due to poor behavior, weather, or safety were associated with lower levels of PA in adolescents.

According to Kobayashi et al. (2019), Hispanic parents undergo greater levels of stress due to immigration, acculturation, and ethnic discrimination. It can also be presumed that a part

of this stress stems from the cultural family roles of the mother and father aforementioned (Soltero et al., 2021). In the Kobayashi et al. (2019) study, a link was found between the number of chronic stressors undertaken by the parents and the likelihood of their child being obese. It was found that there was a 12% increase in obesity among parents with three or more chronic stressors compared to parents with none. This study used health informatics from questionnaires administered to child-parent dyads that assessed levels of activity among the children, stress levels of the parents, and overall level of family communication. They found that as stress levels increased among parents, their child's MVPA decreased, and as family communication levels increased, so did MVPA of the children. They hypothesized that the negative relationship between stress and MVPA could be due to parent's not having enough time to facilitate MVPA or not having the mental capacity to discourage sedentary behavior. If stress levels are high, the consequences can be buffered by positive communication between the parents and children. The authors suggested that this buffering theory could be attributed to "promotive discussion related to youths' engagement in MVPA and other positive lifestyle behaviors," (Kobayashi et al., 2019).

ORGANIZATION, COMMUNITY, ENVIRONMENT, AND POLICY FACTORS

Schools are considered the easiest and most effective way to increase physical activity (PA) and healthy behaviors among adolescents (Creamer, 2020). It has been proven that PA improves academic achievement, cognitive skills, and academic behavior (Escaron et al., 2020). In 2004, the Child Nutrition and Women, Infants, and Children Reauthorization Act was passed, which required all school districts that participated in the United States Department of Agriculture's school meal program to implement a wellness policy with strong wellness promotion strategies, including PA (Creamer, 2020). This law was passed in accordance with research on the importance and effectiveness of wellness policies, with an emphasis on the strong language used in the policy, since it was found schools with strong and comprehensive language in their wellness policy had healthier students (Escaron et al., 2020). The Center for Disease Control and Prevention released a comprehensive list of guidelines all schools are encouraged to adhere to (Lee, 2011). The guidelines include establishing a school health team, ensuring that spaces for PA are safe, and requiring all K-12 students to participate in daily physical education (PE).

School wellness policies are recommended to dedicate 50% or more of after-school program time and physical education to PA, which very few schools adhere to (Escaron et al., 2020). They also recommend physical education classes incorporate creative and age-appropriate games and exercises students can also do at home. One study found the availability of exercise equipment and a safe recess environment strongly affected the likelihood of students to exercise, especially females (Escaron et al., 2020). However, physical education teachers, supportive exercise practices, and activity spaces are less common in low socioeconomic status school districts with a high percentage of minorities than in their high SES counterparts (Escaron et al., 2020). According to Creamer et al. (2020), 15.7% of Latinx persons in the U.S. are living below the poverty line. This highlights the gap between the resources available to Latinx adolescents and their non-Hispanic White counterparts.

The physical environment of adolescents can either foster or inhibit PA. Lee et al. (2011), concluded that both adolescents and their parents perceive safety, sidewalks, and traffic as barriers to PA. On the contrary, Maddison et al. (2009), found an environment that is deemed as safe, easily walkable, and well lit had increased rates of physical activity (Maddison et al., 2009). The authors stated that since many Latinx communities live in povertized neighborhoods, which are characterized by violence and poor infrastructure, Latinx adolescents are at a disadvantage. According to the study, not only did one's neighborhood affect their attitude towards PA, but so did the availability of exercise equipment in their homes or near their homes. This perceived lack of accessibility was associated with decreased levels of PA as well as a more negative attitude towards PA.

A safe environment also builds stronger relationships among community members, which can play an important role in physical activity levels, as many place priority among the relationships with their peers and their church (Arredondo et al., 2014). According to Arredondo et al. (2014), approximately 68% of Latinos identify as Catholic and around 42% of this population attends church weekly. One study, "Padres Preparados, Jóvenes saludables," created a community-based program for Latino father-son dyads over an eight week period that sought to increase activity by teaching different physical activities all together before separating for an educational lesson. The study found that its methods were successful in increasing PA and decreasing sedentary behavior by not only educating the adolescent, but educating the father also so that the father could serve as a role model (Zhang et al., 2019).

According to Arredondo et al. (2014), approximately 68% of Latinos identify as Catholic and around 42% of this population attends church weekly. Because of this high prevalence, the authors conducted a church-led program for mother-daughter dyads to incorporate the culture of the community and build relationships among members. The program encouraged PA by teaching different physical activities and reciting bible verses that supported physical health before every meeting. These methods were successful, with the mothers reporting that their daughters had increased weekly PA by 97 minutes, or 32%, following the program.

SUGGESTIONS FOR INTERVENTION

A behavior is most effectively changed when the intervention targets multiple factors that affect the behavior. After thorough research, it is clear that factors from the intrapersonal, interpersonal, community, organizational, and policy levels are all important in influencing physical activity among Latinx adolescents. In order to reach these many facets at once, a multilevel approach must be taken.

Since adolescents are easily reached in school, a suggestion is to target the organizational level first. Implementing a wellness policy that requires all students to participate in daily physical education would increase adolescents' knowledge about the importance of physical activity while creating positive attitudes, both of which are proven to impact PA (Perry et al., 2011). In addition, this could help bridge the 17.5% knowledge gap between girls and boys (Eakin et al., 2005). Within the daily physical education, wellness objectives can require students to be encouraged to create their own physical activity games in order to increase creativity and autonomy while also providing age-appropriate activities which can be done at home (Escaron et al., 2020).

Since 15.7% of Latinx persons in the U.S. are living below the poverty line, ideally, fundraising for low-income schools could be put towards new equipment and recreational areas that are safe and accessible for all students, inside and outside of school hours (Creamer, 2020). This is in line with a study done by Escaron et al. (2020) that verified a relationship between the safety and accessibility of exercise equipment and recess areas and the likelihood of adolescents to exercise. Although not as easily changed, measures could be taken to increase sidewalks and lighting in neighborhoods or nearby parks, which are both factors that could increase rates of physical activity and decrease the barriers perceived by both adolescents and their parents (Lee, 2011).

According to the *Journal of Nutrition Education and Behavior* (2018), the perceived barriers of parents have a great impact on the PA levels of adolescents. Many parents maintain cultural beliefs that skinny kids are unhealthy and unhappy, or that only organized physical activity, and not leisurely activity, is beneficial for physical health (Stang & Bonilla, 2018). This stigma can be combated by sending home informational flyers with students that educate parents on the importance of physical activity, both organized and unorganized, as well as provide suggestions for at-home physical activities. Furthermore, programs can be initiated for father-son and mother-daughter dyads to learn about physical activity and participate in engaging activities together, which has been shown to increase PA levels (Zhang et al., 2019). This program would simultaneously educate the parent and adolescent while creating stronger familial communication surrounding physical activity. Targeting physical activity through multifaceted interventions increases the probability of producing a behavior change and improving the pressing issue that plagues Latinx adolescent communities.

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