

Relationship between Physical Activity and Emotional Intelligence and Bullying Among School Children

Yaneth Herazo-Beltrán¹, Lilia Campo-Tenera², Floralinda García-Puello³, Orlando Méndez⁴,
Mariela Suarez-Villa⁵, Francisco Vásquez-De la Hoz⁶ & Narledis Núñez-Bravo⁷

Abstract

This work aims to determine the relationship between the level of physical activity in children, emotional intelligence, and bullying. A cross-sectional cohort study was conducted on 991 children, and adolescents between ages seven and 17 years from a sample of 16 public schools in Barranquilla, Colombia. The participants completed the Physical Activity Questionnaire for children and the Physical Activity Questionnaire for adolescents, along with the My Life at School questionnaire to determine the indexes of bullying and general aggression, the risk of bullying, and positive and negative behaviors. The Trait Meta-Mood Scale-24 was used to evaluate attention, clarity, and emotional repair ability. A binary logistic regression analysis was used to determine the relationship among levels of physical activity, bullying, and emotional intelligence. A total of 65.4% of the participants had low levels of physical activity. The Bullying index was 55.6%. The students who did not regularly engage in physical activity had a higher probability of being victims of school harassment [OR 1.3 (95% CI: 1.1–1.6)] and higher levels of general aggression [OR 1.4 (95% CI: 1.1–1.8)]. Furthermore, the females who did not regularly engage in physical activity reported having less control of their feelings [OR 1.6 (95% CI: 1.1–2.5)]. The results indicate that physical activity should be encouraged in schools to prevent bullying and violence.

Keywords: motor activity, school harassment, bullying, emotional intelligence

Physical activity is an essential element of health. A wealth of evidence has concluded that it has beneficial effects on the physical and mental health of children and adolescents and reduces the probability of chronic non-communicable diseases. Physical activity positively influences self-esteem, as well as reduces anxiety and depression (Janssen and Leblanc, 2010). Children and adolescents should aim for at least 60 to 90 minutes of moderate or vigorous physical activity every day (Department of Health and Human Services, 2008).

The World Health Organization has declared that one of the ten main causes of mortality and morbidity in the world is physical inactivity. Approximately 2 million deaths per year are attributed to a lack of physical activity. Sedentariness increases the risk of cardiovascular disease, diabetes, obesity, colon cancer, and breast cancer, which makes it one of the most serious and, at the same time, poorly addressed public health problems of the modern era (World Health Organization, 2010).

Physical activity has numerous benefits that include greater emotional health, improved cognitive functioning, and a better quality of life (Brown et al., 2007; Asare and

Danquah, 2015). Previous studies have reported that since physical activity diminishes stress and anxiety, and enhances self-esteem, emotional self-control, and the development of interpersonal skills, it improves psychological well-being (Brosnahan, Steffen, Lytle, Patterson and Bostrom, 2004; Jiménez and Durán, 2005). In other words, psychological well-being is closely related to stability and emotional intelligence (Bermúdez, Álvarez and Sánchez, 2003). Decreased stress and anxiety, and the enhancement of interpersonal skills such as self-concept and emotional self-control allow individuals to solve problems and adapt to the environment. People who can recognize not only their own emotions but also those ones of others effectively (empathy) can establish higher quality interpersonal relationships (Vásquez et al., 2010) that favor the school environment and coexistence with others (Martorell, González, Rasal and Estellés, 2009). Previous research has supported a negative correlation between practicing physical activity and mental health in adolescents (Asare and Danquah, 2015).

The concept of Emotional Intelligence (EI), considered in this paper, is based on adaptive principles of emotions,

¹ Universidad Simón Bolívar, Barranquilla, Colombia. Correspondencia: Yaneth Herazo-Beltrán. Correo electrónico: aherazo4@unisimonbolivar.edu.co

² Universidad Simón Bolívar, Barranquilla, Colombia

³ Universidad Simón Bolívar, Barranquilla, Colombia

⁴ Caja de Compensación Familiar de Barranquilla, ComBarranquilla, Colombia

⁵ Universidad Simón Bolívar, Barranquilla, Colombia

⁶ Universidad Cooperativa de Colombia, Montería

⁷ Universidad Simón Bolívar, Barranquilla, Colombia

including emotion perception and value as well as appropriate emotional expression and emotional thought management (Mayer and Salovey, 2007; Pacheco and Berrocal, 2005). We focus on the knowledge related to children's emotional states and their personal assessments, according to reflective point of views on emotional experiences (Nelis, Quoidbach, Mikolajczak and Hansenne, 2009).

Studies have shown that EI has a positive impact on physical and mental health (Mikolajczak, Petrides and Hurry, 2009). It helps people develop coping strategies (Tsaousis and Nikolaou, 2005), and in developing healthy relationships (Saklofske, Austin, Rohr and Andrews, 2007). EI also has a positive impact on physical health (Schutte, Malouff, Thorsteinsson, Bhullar and Rooke, 2007) and in promoting a physically active lifestyle (Omar, Ismail, Omar-Fauzee, Abdullah and Geok, 2012). Likewise, EI is considered as a differential element among school children involved or not involved in bullying (Elife, Ortega, Hunter and Del Rey, 2012).

Bullying is defined as repeated physical or emotional aggressions among peers. It can begin in school and create a vulnerable attitude in the victim who feels unable to leave the situation on his or her own initiative (Turner, Exum, Brame and Holt, 2013). Previous research has produced differing results. Chacón et al. (2015) found that men observe bullying more often and harass others more often than women do, and they suffer more school violence. On the other hand, Romera, Del King and Ortega (2011) and Hoyos, Llanos and Valega (2012) found that men tend to be victims and aggressors in bullying situations, and women tend to be the spectators.

Many studies on physical activity have shown physiological, cognitive, and social affective benefits (Chacón et al., 2015; Lois and Rial, 2016). Physical activity can promote prosocial behaviors such as encouraging cooperation, empathy, and EI (Pelegrín, Garcés de los Fayos and Cantón, 2014). In addition, physical activity contributes to reducing violent behaviors by encouraging impulse control (Espejo, Chacón, Zurita and Castro, 2016).

The findings discussed here indicate the need to study the relationship between physical activity, EI, and bullying further. This relationship has been poorly researched in the Latin American context.

Method

This was a cross-sectional cohort study. A total of 991 children and adolescents from Barranquilla, Colombia participated in the study. These results are part of the diagnostic characterization phase of a project based on the Promotion of Healthy Life Styles in children over six years of age and adolescents conducted by the IMAGENIA Science Museum and funded by COLCIENCIAS (Code M101PR03F09). The study participants were between 7 and 17 years old (3.1% were 7 years old, 8% were 8 years old, 14.8% were 9 years old, 7.9% were 10 years old, 7.7% were 11 years old, 14.2%

were 12 years old, 13.2% were 13 years old, 13.3% were 14 years old, 6.8% were 15 years old, 6.8% were 16 years old, and 4.2% were 17 years old.). The participants attended 16 public schools in Barranquilla. The participants were chosen randomly and proportional to the academic grade and gender. The sampling was a simple random probability with replacement.

The researchers received parental and participant permission and, then, used interviews as the assessment tools to comprehend and contextualize each question. The participant activity levels were evaluated through a Physical Activity Questionnaire for school-age children (PAQ-C), which has an acceptable level of reliability (Cronbach's alpha of 0.71), (Herazo and Domínguez, 2012), and a Physical Activity Questionnaire for adolescents (PAQ-A). Both of the questionnaires asked about the levels of activity from moderate to vigorous physical activity in the last seven days during the school year, with a five-point scale of response options. The questions covered the activities performed during leisure time, physical education classes, recess, lunch break, immediately after school, during the afternoon, and on weekends. The final score was estimated by taking into consideration nine questions, where 1 indicates low physical activity and 5 indicates high physical activity (Herazo and Domínguez, 2012).

In addition, the participants completed the checklist My Life at School, which aims to evaluate bullying and general aggression indexes. It measured the risk of bullying and the positive and negative behaviors that students received from their school mates. The 1991 version by Arora (1994) included 39 items that evaluate whether students have been victims of aggression or intimidation during the past week. This questionnaire explores a set of situations describing the behaviors exhibited by other students against the student being evaluated, who becomes the victim in case of enduring aggression or intimidation (Arora, 1994). A level of reliability of the internal consistency of excellent (Cronbach's alpha 0.91) was obtained.

According to Arora (1994), the bullying index was estimated (answers of more than once) along with the general aggression index (answers of once and more than once) by analyzing items 4, 8, 10, 24, 37, 39. The sum of the responses to 14 statements was used to determine the positive behaviors, and the negative behaviors were determined by the sum of the responses for 19 statements. For the prior correction, 1 point was assigned to answers of "once" and 2 points to "more than once" (Arora, 1994).

EI was measured through the Trait Meta-Mood Scale-24 (TMMS-24), an instrument composed of 24 items that determine attention, clarity, and emotional repair through eight items for each sub-factor. Students assign a value from 1 to 5 to each question. The final score is achieved from summing the items from one to eight for the perception factor, from 9 to 16 for the comprehension factor, and from 17 to 24 for the regulation factor. In the Emotional Attention category, the students were categorized as

either pays adequate attention, pays too much attention, or pays little attention. Regarding the categories of Clarity and Emotional repair, the scores were adequate, low, or excellent. A level of reliability of the internal consistency of excellent (Cronbach's alpha 0.93) was obtained.

The SPSS statistical package (version 18.0, license N° 0138194) was used to analyze the information. A binary logistic regression analysis was used to estimate the relationship among the levels of physical activity and EI and bullying in the participating children and adolescents. The Odds Ratios (OR) were determined with their respective confidence intervals at 95%.

Results

Table 1 shows that 56.7% of the respondents were females, 58.5% were over 12 years old, and 55.1% were from socioeconomic strata 1 and 2. In terms of the levels of physical activity, 65.4% of the participating children and adolescents had low levels of physical activity.

Table 1
Baseline Characteristics and Practice of Physical Activity of Participating Children and Adolescents

Categories/Variables	Frequency	Percentage
Gender		
Female	562	56.7
Male	429	43.3
Age range		
7–11 years	411	41.5
Over 12 years	580	58.5
Socioeconomic level		
Level 1	192	19.4
Level 2	354	35.7
Level 3	337	34
Level 4	108	10.9
School Grade		
Grade 3	148	14.9
Grade 4	148	14.9
Grade 5	85	8.6
Grade 6	87	8.8
Grade 7	168	17
Grade 8	99	10
Grade 9	146	14.7
Grade 10	69	7
Grade 11	41	4.1
Levels of physical activity		
Active	343	34.6
Inactive	648	65.4

In relation to the EI variable, it was found that most of the male participants (63.9%) had a low perception of their feelings and emotions. In terms of the clarity variable range, understood as the capacity to understand emotional states

correctly, the males had a lower comprehension of their moods (70.9%) than the females (49.6%) did. For emotional repair, 55.2% of the male students had a low capacity to regulate their emotional states, whereas 39% of the female participants showed an adequate capacity (Table 2).

Table 2
Emotional Intelligence in Participating Children and Adolescents

Dimensions of Emotional intelligence	Women	Men
Emotional attention		
Adequate attention	176 (31.3)	140 (32.6)
Pays too much attention	25 (4.4)	15 (3.5)
Pays little attention	361 (64.2)	274 (63.9)
Emotional clarity		
Adequate clarity	217 (38.6)	103 (24)
Low clarity	279 (49.6)	304 (70.9)
Excellent clarity	66 (11.7)	22 (5.1)
Emotional repair		
Adequate repair	219 (39)	157 (36.6)
Low repair	253 (45)	237 (55.2)
Excellent repair	90 (16)	35 (8.2)

As Table 3 shows, 55.6% of the participants answered "more than once" in the items reporting the amount of bullying. Regarding the general aggression index, 66.5% answered "once" and "more than once." Low positive behaviors were observed in 50.1% of the students and 76.5% showed high negative behaviors.

Table 3
Bullying Phenomenon in the Classroom

Dimensions/Aspects	Frequency	Percentage
Bullying index		
Answered "more than once"	551	55.6
General aggression index		
Answered "once" and "more than once"	659	66.5
Risk of bullying		
High	2	0.2
Moderate	40	4.0
Low	567	57.2
Without risk	382	38.5
Low positive behaviors	496	50.1
High negative behaviors	758	76.5

The binary logistic regression showed that students who were not engaged in regular physical activity had a higher probability of becoming victims of school harassment or bullying [OR 1.3 (95% CI: 1.1–1.6)], as well as a higher probability of general aggression [OR 1.4 (95% CI: 1.1 –

1.8)]. When physical activity and ability to regulate emotions are related, a lack of physical activity puts students at risk of low control of their feelings [OR 1.6 (95% CI: 1.1 – 2.5)] (Table 4).

Table 4

Relationship Among Physical Inactivity, Bullying, and Emotional Intelligence

Dimensions/Aspects	OR	95% CI	p value
Bullying index			
No presence of bullying(referent)	1	-	-
Presence of bullying	1.3	1.1–1.6	0.04
General aggression index			
No presence of general aggression (referent)	1	-	-
Presence of general aggression	1.4	1.1–1.8	0.01
Positive behavior			
Not received positive behavior (referent)	1	-	-
Received positive behavior	0.9	0.7–1.2	0.8
Negative behavior			
Not received negative behavior (referent)	1	-	-
Presence of Negative behavior	0.7	0.5–0.9	0.03
Emotional care women			
Not received emotional care women (referent)	1	-	-
Presence of emotional care women	0.9	0.6–1.4	0.7
Emotional care men			
Not received emotional care men (referent)	1	-	-
Presence of emotional care men	1.2	0.7–1.9	0.4
Emotional clarity women			
Not receive emotional clarity women	1	-	-
Presence of emotional clarity women	1.1	0.6–1.6	0.8
Emotional clarity men			
Not receive emotional clarity men	1	-	-
Presence of emotional clarity men	0.7	0.5–1.3	0.3
Emotional repair women			
Not receive emotional repair women	1	-	-
Presence of emotional repair women	1.6	1.1–2.5	0.03
Emotional repair men			
Not receive emotional repair men	1	-	-
Emotional repair men	1.1	0.6–1.6	0.9

Discussion

The results related to the prevalence of physical activity are similar to previous research that have shown low levels of physical activity to have an unhealthy physical condition in the school-age population (Galvez et al., 2015; Tovar, Gutierrez, Ibáñez and Lobelo, 2008). Likewise, these results reveal that the levels of physical activity found in the school-age population, similar to national and international findings, indicate non-compliance with the recommendations by the World Health Organization related to the frequency and intensity of physical activity that should be carried out at these ages (World Health Organization, 2010; Duperly et al., 2011; Campo et al., 2016). This lack of physical activity leads to increased risk factors for developing chronic non-communicable diseases and can have

lasting effects on physical and emotional health through adulthood (Sims, Scarborough and Foster, 2015).

In addition, the study results regarding the low perception of emotional regulation, high percentage of negative behaviors, low frequency of positive behaviors, and presence of an important index of bullying on student participants, suggest that school violence is becoming a complex phenomenon that naturally affects the existence of schools, hinders learning, alters the natural dynamics of the educational community as a whole, and is present in all the social classes (Varela, 2011). This phenomenon has been reported by numerous national and international researchers (García, Pérez and Nebot, 2010; Gómez et al., 2010; Musalem and Castro, 2015; Trautmann, 2008). Researchers are prioritizing the study of bullying and aim to diagnose and design intervention strategies.

Considering this situation, the results of the binary logistic regression are transcendental and reveal that students who do not perform physical activity regularly have a higher probability of becoming victims of school harassment, bullying, and general aggression. Diverse studies have found significant associations among low levels of physical activity and sedentary life styles with bullying in the school-age population and vice versa (Demissie, Lowry, Eaton, Hertzand and Lee, 2014). Perceived EI becomes important to distinguish between school children who are involved in bullying from those who are not involved (Elipe et al., 2012).

A study was conducted in the United States to evaluate the influence of school harassment on regular performance of physical activity. The results indicate that victimization through school harassment is predictive of the number of days in which students engaged in physical activity (Roman and Taylor, 2013).

In addition, the results obtained are relevant regarding the risk for inactive girls who have or do not have adequate control over their feelings and emotions. Other studies assert that the relationship between bullying and physical activity does not show significant differences because of gender, unlike sports (Chacón et al., 2015) and physical activity, which have a negative relationship with victimization (Espejo et al., 2016). Similar studies show significant associations between the number of hours dedicated to the practice of physical activity and emotional balance (Swagerman et al., 2015). For example, physically active students achieved higher scores in the variables measuring well-being (self-esteem and satisfaction with life) and clarity and emotional repair. In other words, the practice of physical activity favors subjective well-being and EI, respectively (Fernández, Almagro and Sáenz, 2015). It has been demonstrated that physical activity improves different aspects of people's mental and social health (Arriscado, Muros, Zabala and Dalmau, 2015). Furthermore, sports can be a con-

trolling factor for aggressive behaviors in school children (Pelegrin et al., 2014).

The above-mentioned studies suggest the likely positive impact of regularly engaging in physical activity to balance and regulate emotions in children and adolescents. Physical activity can manage and prevent bullying, as well as reduce general aggression (Zurita, Vilches, Padial, Pérez and Martínez, 2015). Furthermore, a similar relationship is indicated by studies that examine the predictive strength emotional reactions have upon the practice of physical activity (Ries and Sevillano, 2011).

Based on this reciprocity, the most important point here is that healthy life styles should be promoted by educational centers (educational institutions at any level or science museums, etc.), with special and guided programming that includes physical activity and the acquisition of EI abilities (emotional self-regulation). These actions can help prevent violence in school. This type of education can be implemented through psycho-educational programs and/or including such themes in the curricular activities in classrooms, but also by opening municipal/state interactive thematic halls that promote health in children and young adults. These strategies can improve the quality of life for this population (Slingerland and Borghouts, 2011).

The authors recommend that the scientific community develop future correlational research that allows for a more profound investigation into the relationship between the regular practice of physical activity, EI, and the risk of bullying in school-age children and adolescents.

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Actividad física y su relación con la inteligencia emocional y el bullying en niños y adolescentes escolarizados

Resumen

El objetivo del presente estudio es determinar el nivel de actividad física en niños, niñas y adolescentes y su relación con la inteligencia emocional y el bullying. Estudio de corte transversal en 991 niños, niñas y adolescentes entre 7 y 17 años de edad de 16 escuelas públicas de la ciudad; se aplicó el Cuestionario de Actividad Física para niños escolares y el Cuestionario de Actividad Física para Adolescentes; la Lista de Chequeo: Mi Vida en la Escuela para determinar los índices de bullying y general de agresión, el riesgo de bullying y conductas positivas y negativas; y el TMMS-24, para evaluar la atención, claridad y reparación emocional. La relación entre los niveles de actividad física, el bullying y la inteligencia emocional se realizó a través de un análisis de regresión logística binaria. El 65.4% de los participantes tienen bajos niveles de actividad física; el Índice de bullying fue del 55.6%. Los estudiantes que no realizan actividad física de manera regular tienen mayor probabilidad de ser víctima de acoso escolar [OR 1.3 (IC 95%: 1.1-1.6)], de agresión general [OR 1.4 (IC 95%: 1.1-1.8)] y de bajo control de sus sentimientos en las mujeres [OR 1.6 (IC 95%: 1.1-2.5)]. Los estudiantes que no realizan actividad física de manera regular tienen mayor probabilidad de ser víctimas de acoso escolar, bullying y agresión general. La inclusión de la actividad física en los programas preventivos del acoso y violencia escolar es un imperativo en los colegios estudiados.

Palabras Clave: actividad motora, acoso escolar, bullying, inteligencia emocional

Atividade física e seu relacionamento com a inteligência emocional e o bullying em crianças e adolescentes escolarizados

Resumo

El objeto do presente estudo é determinar o nível de atividade física em crianças e adolescentes e seu relacionamento com a inteligência emocional e o bullying. Estudo de corte transversal em 991 crianças e adolescentes entre 7 y 17 años de idade de 16 escolas públicas da cidade; Foi aplicado O Teste de Atividade Física para escolares e O teste de Atividade Física para Adolescentes; a lista de revisão: Minha Vida na Escola para determinar os índices de bullying e geral de agressão, o risco de bullying e condutas positivas e negativas; e o TMMS-24, para avaliar a atenção, clareza e reparação emocional. A relação entre os níveis de atividade física, o bullying e a inteligência emocional foi feita a través de um análise de regressão logística binária. O 65.4% dos participantes tem baixos níveis de atividade física; O Índice de bullying foi do 55.6%. Os estudantes que não fazem atividade física regularmente tem maior probabilidade de ser vítima de assédio escolar [OR 1.3 (IC 95%: 1.1-1.6)], de agressão geral [OR 1.4 (IC 95%: 1.1-1.8)] e de baixo control de seus sentimientos nas mulheres [OR 1.6 (IC 95%: 1.1-2.5)]. Os estudantes que não fazem atividade física de maneira regular tem maior probabilidade de ser vítimas de assédio escolar, bullying e agressão geral. A inclusão da atividade física nos programas preventivos de assédio e violência escolar é um imperativo nas escolas estudadas.

Palavras Chave: atividade motora, assédio escolar, bullying, inteligência emocional

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