

# Adolescent mental and physical health in the English-speaking Caribbean

Nanlesta A. Pilgrim<sup>1</sup> and Robert W. Blum<sup>1</sup>

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## ABSTRACT

**Objective.** Bronfenbrenner's ecological systems theory, a multisystem framework, was used to identify risk and protective factors associated with adolescent mental and physical health (AMPH) in the English-speaking Caribbean.

**Methods.** A structured literature review, using the online databases of Medline, PsychInfo, and Scopus, was conducted to identify peer-reviewed studies published between January 1998 and July 2011 focused on adolescents ages 10–19 years.

**Results.** Sixty-eight articles were examined: 40 on adolescent mental health (AMH), 27 on adolescent physical health (APH), and 1 on both topics. Key individual factors included gender and age. Religiosity and engagement in other risk behaviors were associated with AMH, while the presence of other chronic illnesses affected APH. Significant determinants of AMH in the microsystem included family and school connectedness, family structure, and socioeconomic status. Maternal obesity, parental education, and school environment influenced APH. Studies that investigated macrosystem factors reported few consistent findings related to AMPH. A history of family mental health problems and physical and sexual abuse was significantly associated with AMH in the chronosystem, while a family history of diabetes and low birth weight were associated with APH. Studies did not examine the exosystem or the mesosystem.

**Conclusions.** AMPH in the English-speaking Caribbean is affected by a variety of factors in developing adolescents and their surroundings. Gender, family, and early exposure to negative environments are salient factors influencing AMPH and present potential avenues for prevention and intervention. A fuller understanding of AMPH in this region, however, requires scientifically rigorous studies that incorporate a multisystem approach.

## Key words

Adolescent health; mental health; exercise; body weight; risk factors; Caribbean region.

Mental and physical health conditions are projected to become the leading causes of disease burden and mortality, respectively, in the world by 2030 (1, 2). Adolescence is a unique developmental period marked by processes such as increased cognitive abilities and physical changes. During this period, adolescents may be vulnerable to mental and physi-

cal health conditions. Adolescents in the English-speaking Caribbean may be particularly vulnerable given reported prevalences of 50% being depressed, 15% to 18% experiencing suicidal ideation, 13% to 27% being overweight, and 6% to 13% being obese (3–9). Considering that the risk of coronary heart disease, ischemic stroke, type 2 diabetes, and disability increases as a result of the aforementioned conditions, curbing their growing prevalence in Caribbean adolescents is necessary (1).

To date, however, the sole comprehensive overview of adolescent health in the English-speaking Caribbean came from the 1997–1998 Caribbean Youth Health Survey, composed of 15 000 adolescents in 9 of the 19 Caribbean countries that make up the region's economic community (3). Since then, only one other published review addressed adolescent mental and physical health (AMPH) (10). Therefore, an understanding of the factors that place youth at high risk or protect them from poor mental and physical health is warranted.

<sup>1</sup> Johns Hopkins Bloomberg School of Public Health, Population, Family and Reproductive Health, Baltimore, Maryland, United States of America. Send correspondence to: Robert Blum, rblum@jhsph.edu

This paper presents a structured review of the scientific AMPH literature in the English-speaking Caribbean from 1998, when the Caribbean Youth Health Survey was completed, to July 2011.

## THEORETICAL PERSPECTIVE

Bronfenbrenner's ecological systems framework was chosen to guide the search for studies and to systematically identify the risk and protective factors that influence AMPH. Understanding AMPH in the Caribbean requires moving beyond focusing solely on adolescents and their behaviors. It requires understanding that adolescents develop within various social environments, which may interact with each other to differentially affect AMPH (11). Bronfenbrenner's ecological system theory, a multisystem perspective, helps to achieve such an understanding because at its core is that development is contextual and the individual is nested in five interlocking systems (11). The microsystem looks at the complex relationship between adolescents and their immediate environment (e.g., parental abuse), while the mesosystem considers the interrelations in major settings where the adolescent exists (e.g., family-church interactions). Exosystems do not contain the adolescent but include immediate settings that may affect an adolescent's growth—parental work pressure, for example. Macrosystems refer to the overarching culture or subculture where the young person develops (e.g., how cultural beliefs influence eating behavior), and chronosystems are made up of changes or consistencies over time as seen in the adolescent and in the adolescent's environment.

## METHODS

### Search strategy

Online databases Medline, PsycINFO, and Scopus were searched for articles published between January 1998 and July 2011. The key words "adolescent, adolescence, and youth" were used in conjunction with the key words "Caribbean" and country-specific names<sup>2</sup> to

conduct the search. We intentionally applied broad search terms to be far-reaching when identifying articles. This method resulted in 2 893 articles whose titles and abstracts were scanned to determine whether they met the review's objective. On the basis of this preliminary review, a total of 243 publications received a comprehensive review (e.g., consistent with inclusion criteria and methodologic quality).

### Criteria for inclusion

The review was restricted to studies that investigated AMPH outcomes or behaviors; contained an English-speaking Caribbean population; concentrated on adolescents 10–19 years of age (or mean age within this range); gave a clear description of methods and results (e.g., sample selection, study design); used a sample size of 100 or more, allowing smaller sizes if the population or outcome assessed was rare; and was published in a peer-reviewed, English language journal between 1998 and July 2011. For studies with wide age ranges (e.g., 6–18 years) resulting in a mean age outside the inclusion criteria, those in which the adolescent age range was analyzed separately were included. The sample size requirement was chosen to ensure that reviewed studies had sufficient statistical power.

Studies that did not provide original data (such as editorials, review articles, and letters to the editor, with the exception of study briefs), studies that evaluated an instrument or technology, and studies in which age could not be determined were excluded.

### Study appraisal and data extraction

The merit of the studies was assessed with a modified quality criteria rating scale (12). The scale ranked studies as excellent, satisfactory, or unsatisfactory on the following criteria: aptness of the study design for analysis, how representative the study population was, appropriateness of the survey instruments used, adjustment for confounders, and comprehensiveness in exploring the research question. For the last measure, the distinction between an excellent and a satisfactory rating depended on whether the study thoroughly addressed all quality criteria. Both authors reviewed studies that came under question for

inclusion. In the end, the review was restricted to studies that received a rating of satisfactory or better.

Data were extracted from articles using a standardized abstraction form. Data extracted included authorship, publication year, location, variables used, sample size and description, study design, measures used, analytic methods, and findings. When studies reported both unadjusted and adjusted analyses, only findings from statistically adjusted analyses were reported. Moreover, one study could contribute multiple findings to the review if it assessed several AMPH outcomes.

Next, findings were organized according to the ecological framework, and the following adolescent mental health (AMH) outcomes were assessed: suicide, depression, rage, psychosocial well-being, body image and satisfaction, eating disorders, weight-loss methods, violence, and substance abuse. For adolescent physical health (APH) outcomes, weight-related outcomes, physical activity, chronic and cardiovascular illnesses, asthma, and oral hygiene were assessed.

Sixty-eight studies, representing 16 English-speaking Caribbean countries, were included in the review (Figure 1). Forty studies assessed AMH, 27 assessed APH, and 1 assessed both. Tables 1 and 2, with detailed information on the reviewed AMH and APH studies, respectively, are available as a [supplementary file](#).

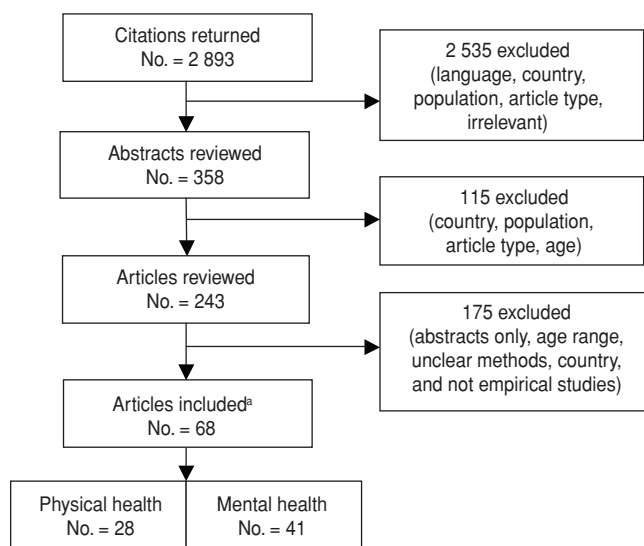
## RESULTS: MENTAL HEALTH

### Individual

**Gender.** Eleven studies reported that females were more likely than males to have depressive symptoms, to have attempted suicide, and to have experienced suicidal ideation (3, 4, 13–21). Four studies did not report a gender association with these outcomes (22–25). Females were less satisfied with their bodies and weight than males (8, 13, 26). Yet, females were more likely to use dieting or exercise as weight loss methods while males were more likely to use laxatives, diuretics, or vomiting (13, 26). Gender was not associated with anorexia nervosa (27).

With the exception of sexual assault, all studies found that males were more likely than females to witness, perpetrate, and experience violence; to experience rage; and to be involved in gangs

<sup>2</sup> Anguilla, Antigua and Barbuda, Aruba, the Bahamas, Barbados, Belize, Bermuda, British Virgin Islands, Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Maarten, Saint Vincent and the Grenadines, Trinidad and Tobago, and Turks and Caicos.

**FIGURE 1. Flowchart showing identification and selection of studies on mental and physical health of adolescents in the English-speaking Caribbean, 1998–2011**

\*One article included both topics.

(3, 13, 28–32). Males were also more likely than females to use or sell drugs and to use alcohol (33–37).

**Age.** The relationship between age and AMH was unclear. Five studies reported that older adolescents were more likely than younger adolescents to have depressive symptoms, to use drugs, to witness violence, and to experience rage (13, 18, 29, 37, 38). In contrast, four studies reported that younger adolescents were more likely to have experienced the former two outcomes, to have attempted suicide, and to be victims of violence (13, 24, 25, 35). Yet, one study reported a U-shaped age relationship for depression in adolescents while another did not find an association (16, 22). Younger adolescents were more satisfied with their bodies but were more likely to use vomiting or laxatives as weight loss methods (13).

**Ethnicity.** The majority of studies reported that ethnicity was not associated with AMPH (14, 18, 27, 39–41).

**Correlation of behaviors.** Being depressed and having other mental health problems were associated with suicidal ideation and suicide attempts (4, 23). Experiencing rage was associated with alcohol use, suicidal behaviors, and perpetrating violence (3, 13, 42).

Youth who engaged in other risk behaviors, such as substance use, were more likely to be depressed, to antici-

pate using alcohol and drugs, to engage in dangerous dietary behaviors, and to perpetrate violence (19, 26, 27, 36, 38, 42). One study reported that youth who suffered from attention problems were more likely to be depressed (25).

Those with discrepancies between who they actually are and their perceived ideal selves were more likely to be depressed and to have low self-esteem (43). Factors such as having fewer social skills and lower commitment to school were associated with gang involvement (32).

**Religiosity.** Religiosity was protective against violence, suicidal outcomes, depression, and alcohol use (14, 18, 23, 42, 44, 45).

**Civic engagement.** A study from Jamaica assessed factors influencing adolescents' cooperation with the police in preventing crimes (46). Judging the police favorably in terms of procedural justice increased cooperation. Gender, believing the police to be proper and just, and distribution of police services were not associated.

### Microsystem

**Family.** A positive family environment was protective against poor AMH. Family connectedness was associated with reduced likelihood of suicidal behaviors, rage, tobacco use, and violence (3, 42). A better parent-adolescent relationship,

as evidenced by high parent-adolescent communication, parental monitoring, and parental attachment and having understanding parents, was associated with reduced likelihood of perpetrating violence, using substances, having depressive symptoms, and attempting suicide and with increased likelihood of having higher social functioning, self-confidence, vocational attitudes, and ethnic identity (3, 4, 14, 18, 20, 34, 36, 42, 47, 48).

Conversely, a poor parent-adolescent relationship—perceived lack of maternal affection and support, being afraid of parents, presence of maternal depression, and being injured by parents—increased the likelihood of depression (15, 19, 24, 25). Adolescents who perceived their parents to have favorable attitudes toward antisocial behavior were more likely to be involved in gangs (32).

Youth living in nonintact families, such as reconstituted families, and those with family problems, such as alcohol abuse in the family, were at higher risk of suicidal behaviors, drug and alcohol use, depression, and eating disorders (4, 14, 18, 19, 26, 27, 35, 37, 42).

**Socioeconomic status.** Low socioeconomic status (SES) was associated with higher scores on internalizing and externalizing problem behaviors and experiencing violence (20, 29, 30). Specifically, low SES and high SES were associated with experiencing neighborhood and school violence, respectively (30). Studies did not find an association between social class and being a victim of violence or weapon usage (28, 30). Greater residential mobility, however, was associated with gang involvement (32).

Youth whose parents were professionals were more likely to use drugs and alcohol than those whose parents were not professionals (35). Low maternal education was associated with higher ethnic identity but high maternal education, in most studies, was protective against depression (16, 21, 48).

One study reported no association between social class and bulimia, while another reported that adolescents whose parents had manual jobs scored higher on the eating disorder scales than those whose parents had nonmanual jobs or were unemployed (27, 41).

**School.** School connectedness was protective against alcohol and tobacco use

and violence, while skipping school was a risk factor for these outcomes (42). Being on a higher academic track in school and attending traditional high schools were associated with lower depressive symptoms than being on a lower academic track and attending nontraditional high schools (21, 22).

**Peers.** Being bullied was associated with increased suicidal ideation, while having close friends was protective against it (4, 14). Cannabis use and alcohol use were positively correlated with their use among the peer group (37). Having peers who were antisocial and used drugs and alcohol was associated with gang involvement (32).

**Residence.** Not cooperating with police to prevent crimes was associated with having an influential area *don*, a local leader who protects the community (46). Youth living in urban areas were more likely to use drugs and to use weapons in violent acts than those living in rural areas (35). Furthermore, the availability of handguns in the community was associated with adolescents' gang involvement (32).

### Macrosystem

One study looked at depression among adolescents in three Caribbean countries: Jamaica, Saint Vincent, and Saint Kitts and Nevis (21). Jamaican adolescents had greater depressive symptoms than adolescents from the other countries. Saint Vincent and Saint Kitts and Nevis did not differ in depressive symptoms.

Two studies reported on cultural differences in psychopathology comparing youth in Jamaica and the United States of America (20, 49). One study reported no significant differences in problem score between the two countries (20). However, Jamaican adolescents reported higher somatic complaints and internalizing behaviors while African American adolescents reported higher attention problems. In another study, Jamaican Americans had higher levels of distress than African Americans and Jamaicans (49). Exposure to community violence was not associated with manifesting psychological distress in any of the groups (49).

### Chronosystem

A history of physical and sexual abuse and of family mental health problems

was associated with attempting suicide, having eating disorders, and experiencing rage (3, 13, 26, 27). A history of physical and sexual abuse was also associated with perpetrating violence (42). A longitudinal study reported that early malnutrition at 6 months of age was positively associated with depression and attention problems (24, 25). Early onset of cannabis use was associated with psychotic symptoms (50).

## RESULTS: PHYSICAL HEALTH

### Individual

**Gender.** A majority of the studies assessing gender reported that females had higher body mass index (BMI), waist circumference, and percent body fat and lower physical activity levels than males (5–7, 9, 51–63). In none of the studies, however, did the authors suggest that the higher BMI, weight circumference, and body fat of adolescent females was a consequence of lower physical activity levels. Two additional studies reported that females had increased risk of being overweight or obese, while another study found no differences by gender (5, 6, 56). Females were more likely than males to have type 2 than type 1 diabetes (52, 64). One study reported that males had higher systolic and diastolic blood pressure readings, but two studies did not find gender differences for blood pressure or metabolic syndrome (59, 60, 65).

Few studies assessed the association between gender and other physical health outcomes. One study reported that females were more likely than males to have asthma (66). Four of five studies found that gender was not associated with dental caries (67–72).

**Age.** Blood pressure increased with age as did type 2 diabetes (52, 59, 64). One study reported that younger adolescents were more likely to be physically active than older adolescents, but another study reported the opposite (13, 53). Age was not associated with being overweight (5, 62). Three studies reported that healthy periodontal conditions decreased with age (68, 70, 71).

**Chronic illnesses.** Adolescents with type 2 diabetes had higher mean BMI, mean waist circumference, and mean systolic blood pressure and lower mean

high density lipoprotein cholesterol; they were more likely to be overweight or obese than those with type 1 diabetes (58, 64). Adolescents who were insulin resistant had higher systolic blood pressure, waist circumference, BMI, fasting glucose, and triglycerides and lower high density lipoprotein cholesterol than those who were not insulin resistant (73). In a sample of Jamaican adolescents with sickle cell disease, youth with greater knowledge about sickle cell disease had better health beliefs about their illness (74).

**Other factors.** Ethnicity was not associated with BMI (62). Other risk factors for being overweight and having high BMI and waist circumference included experiencing internalized racism and consuming sweetened beverages, respectively (6, 52).

### Microsystem

**Family and SES.** Maternal obesity was positively associated with being overweight among adolescents while paternal obesity was not (5). Adolescent males who lived in crowded households were more likely to be underweight (7). Adolescents who were food insecure were less likely to be physically inactive, overweight, or obese (9, 75). Two studies did not find an association between SES and BMI or metabolic syndrome, while one study found that higher SES was associated with being overweight or obese (62, 65, 75). Adolescent obesity increased with decreasing skill level of parental occupation and with decreasing level of parental education (65).

Only two studies assessed the relationship between family environment and oral health (70, 72). Youth of university-educated parents were less likely to have caries than those with high-school-educated mothers or fathers with vocational training (70). However, those with university-educated parents required the most oral health treatment.

**School.** Youth who engaged in physical education in school and those who were in primary school were more likely to be physically active than those who did not engage in physical education and were in secondary school (53).

**Residence.** Three studies looked at geographic differences in oral health (68, 69,



71). One did not find an association (69). While urban youth were more likely to have caries than rural youth, rural youth required more oral health treatment than urban youth (69, 71). Urban or rural residence was not associated with BMI (62).

### Macrosystem

Studies in the macrosystem focused on geographic and cross-cultural comparisons. A cross-national study reported that Tobagonian adolescents had higher absolute weight than U.S. adolescents but there were no differences in absolute BMI between the two groups (57). Adolescents in Quebec, Canada, were more overweight than those in Jamaica (75).

Younger Tobagonian adolescents had lower mean systolic blood pressure but older adolescents had higher systolic blood pressure than their U.S. counterparts (60). Tobagonian adolescents had higher diastolic blood pressure and lower systolic blood pressure than Jamaican and British adolescents. Students from Tobago were more likely to experience asthma symptoms, wheezing attacks, sleep disturbance from wheezing, and speech limitation than those from Trinidad (66).

### Chronosystem

A family history of diabetes was not associated with physical activity (51). Two of three studies reported an association between adolescents' birth weight and physical health (7, 51, 61). Among low-birth-weight adolescents, girls with a family history of diabetes had higher fasting glucose and insulin resistance than those without a history (51). Low-birth-weight boys compared with normal-birth-weight boys had significantly smaller waist circumference among those without a family history of diabetes (51). Among girls, low birth weight was negatively associated with being overweight (7). A longitudinal study reported that maternal weight and BMI during pregnancy were positively associated with physical activity in adolescence; bigger mothers had more active adolescents (61).

One study in Jamaica assessed the effects of salt fluoridation. The data reflected a major improvement from 1984 to 1995 in the mean score for decayed, missing, and filled teeth. In 1984, the

score was 6.72 at age 12 years and 9.60 at age 15 years. By 1995, the scores were 1.08 and 3.02, respectively (67).

### DISCUSSION

This review's objective was to identify the risk and protective factors associated with AMPH in the English-speaking Caribbean. At the individual level, gender and age were key factors associated with AMPH. Religiosity and engagement in risk behaviors emerged as important factors associated with AMH and, not surprisingly, the presence of chronic illnesses influenced APH. Within the microsystem, family factors were important influences on AMPH. Within the macrosystem, studies focused on cross-cultural comparisons but did not show consistent findings. Within the chronosystem, a history of physical and sexual abuse and family mental health problems influenced AMH, while a family history of diabetes and low birth weight influenced APH. Studies did not assess the exosystem or the mesosystem.

Gender was a salient factor in determining AMPH. As reported elsewhere, male adolescents exhibited externalizing behaviors, while female adolescents exhibited internalizing behaviors (76, 77). Female adolescents were at greatest risk for poor mental health, worse weight outcomes, less physical activity, and poor cardiovascular conditions. Male adolescents, however, were at greatest risk for substance abuse and perpetrating, experiencing, and witnessing violence. As such, programs and policies that address these outcomes must be cognizant of the influence of gender and be prepared to develop different initiatives for male and female adolescents. Programs that offer things such as skills training for emotional regulation, coping skills for managing stress and depression, and healthy dietary behaviors might foster better AMPH, especially for females (77). Policies advocating for reduced youth access to alcohol, drugs, and weapons and programs focused on conflict resolution skills at the individual and community levels might promote better AMPH, especially for males.

This review highlights the importance of the family environment in AMPH. A positive family environment, such as feeling connected to parents, reduced the likelihood of negative AMPH. Other

aspects, such as residing in a family with substance abuse problems, increased the likelihood of experiencing poor AMPH. These findings are consistent with research from other parts of the world that has shown that the family context is vital to adolescent health outcomes (76, 78). Research is needed that investigates family dynamics and how to address concurrent family and AMPH. When initiating preventive measures, programs must incorporate and address the needs of the entire family, not solely the adolescent, in order to succeed. Enhancing the protective aspects of the family environment can prevent AMPH and minimize the threat of other risk factors for these conditions (77).

This review also pinpoints the need to incorporate a multisystem and a health-across-the-lifespan approach in AMPH research. Factors such as low birth weight were important to AMPH outcomes. However, the lack of longitudinal studies precluded the ability to draw any causal inferences from these findings. Moreover, the studies that looked at the larger macrosystem focused primarily on cross-national comparisons rather than on the macrosystem within countries that may affect AMPH, such as government policies on mental and physical health. Furthermore, the correlation among behaviors, such as youth who engage in risk behaviors being more likely to have depressive symptoms, suggests that there may be a highly vulnerable subset of adolescents in the region who require immediate mental and physical health services.

This review has three notable limitations. First, the search strategies may have overlooked some studies if they were not indexed in the databases examined. Second, the study focused only on the peer-reviewed literature, excluding dissertations, conference abstracts, and other gray literature, which often do not receive rigorous review or are inaccessible. Third, assessment of the studies' methodologic quality was based on a rating scale that has not been tested for validity.

Despite limitations, this review offers important insights into the mental and physical health of Caribbean adolescents and highlights new avenues for research. Although not an objective of this review, it is noticeable that methodologically rigorous research on AMPH

in the Caribbean is lacking. All but two studies were cross-sectional. Research in the Caribbean would benefit from: theory-driven research; advanced study designs (e.g., longitudinal and qualitative designs) and statistical analyses; critical assessment of the validity

and reliability of the data obtained, especially with regard to instruments used; a multisystem approach to research; and intervention research aimed at improving AMPH outcomes. While there is a significant volume of research on AMPH in the Caribbean, there is a long way

to go until there is a knowledge base upon which to build evidence-based interventions.

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## Salud mental y física de los adolescentes en el Caribe de habla inglesa

### RESUMEN

**Objetivo.** Se empleó la teoría de sistemas ecológicos de Bronfenbrenner, un marco conceptual multisistémico, para identificar los factores de riesgo y de protección asociados con la salud mental y física de los adolescentes en el Caribe de habla inglesa.

**Métodos.** Se llevó a cabo una revisión bibliográfica estructurada usando las bases de datos en línea MEDLINE, PsychInfo y Scopus, para identificar estudios con revisión externa publicados entre enero de 1998 y julio del 2011 centrados en adolescentes de 10 a 19 años.

**Resultado.** Se examinaron 68 artículos: 40 sobre salud mental en adolescentes, 27 sobre salud física en adolescentes y 1 sobre ambos temas. Los factores individuales clave incluyeron el sexo y la edad. La religiosidad y la participación en otros comportamientos de riesgo se asociaron con la salud mental, mientras que la presencia de otras enfermedades crónicas afectó a la salud física. Los determinantes significativos de la salud mental en el microsistema incluyeron la vinculación con la familia y la escuela, la estructura familiar y la situación socioeconómica. La obesidad materna, la educación parental y el ambiente escolar influyeron en la salud física. Los estudios que investigaron los factores del macrosistema informaron pocos resultados consistentes relacionados con la salud mental y física en los adolescentes. Los antecedentes familiares de problemas de salud mental, y el maltrato físico y el abuso sexual presentaron una asociación significativa con la salud mental en el cronosistema, mientras que los antecedentes familiares de diabetes y peso bajo al nacer se asociaron con la salud física. Los estudios no examinaron el exosistema o el mesosistema.

**Conclusiones.** La salud mental y física de los adolescentes en el Caribe de habla inglesa está afectada por varios factores de su desarrollo y su entorno. El género, la familia y la exposición temprana a un entorno negativo son factores destacados que influyen en la salud mental y física de los adolescentes y representan posibles caminos para la prevención y la intervención. No obstante, para alcanzar una comprensión más integral de la salud mental y física de los adolescentes en esta región se requieren estudios científicamente rigurosos que incorporen un enfoque multisistémico.

### Palabras clave

Salud del adolescente; salud mental; ejercicio; peso corporal; región del Caribe.