

Health concerns and health-risk behaviors among school-aged children in Saudi Arabia

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ABSTRACT

Childhood and adolescence are profoundly important for the public health future. Children and adolescents experience rapid physical, physiological, and behavioral changes. In addition, there is substantial evidence that the promotion and protection of childhood health are essential to sustainable public health and social and economic development. This review explored research relevant to children and adolescent health-related behaviors to identify key behaviors and behavioral factors for targeting health promotion interventions. We examine what is currently known about health-related behaviors including dietary behaviors, physical activity, smoking, sexual behaviors, violence, and mental health and the health needs of the importance of strengthening children and adolescent health services to meet their needs. The review was conducted using electronic databases of PubMed and Google Scholar and official websites. Most of the studies found were cross-sectional, and they dealt with specific health behaviors. In general, Saudi children and adolescents engage in a wide range of risky behaviors at an alarming rate, including low physical activity, poor dietary behaviors, a high rate of overweight and obesity, smoking cigarettes, and engaging in violent behaviors. However, there is limited information on the magnitude of health-related problems and risky behaviors among children and adolescents in Saudi Arabia. It is imperative to note that similar to adolescents and children around the world, Saudi's young population is at risk of a myriad of communicable and noncommunicable diseases owing to the high prevalence of various health risk behaviors. Although school health services need improvement, we first need more detailed and systematic national data on child and adolescent health-related behaviors in Saudi Arabia.

Keywords: Adolescents, children, health-related behaviors, public health, Saudi Arabia, school health

Introduction

According to the World Health Organization (WHO), children are defined as people below the age of 19 years.^[1] Today's generation of children and adolescents is the largest in history. Approximately 1.2 billion people, one in six of the world's population, are between the ages of 10 and 19.^[2] Children and adolescents are regarded as a vulnerable population given their

dependency on the adults for development and improved quality of life.

It is widely recognized that adolescence is a very important transition stage and is characterized by many physical and psychological changes. One of the fastest and formative stages of human growth is adolescence.^[3] The significant physical, emotional, and social changes that occur during adolescence present new health risks^[3] as well as unique opportunities for health improvements.^[4] Adolescence is characterized by diverse physical, cognitive, and social development, all of which call for specific consideration. Adolescence's special characteristics and significance need for explicit and specific consideration in health policy and initiatives.

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The physical and behavioral changes that occur during adolescence are associated with risk factors that can determine health later in life. Adolescent risk behaviors can inflict high morbidity and mortality as well as place a large economic burden on adolescents, their households, and healthcare systems. In their comprehensive analysis of international indicators of adolescent health, Patton and colleagues found that many of the causes of preventable mortality and morbidity increase substantially during adolescence, including injury (road traffic injuries, suicides, and other types of violence), maternal death, communicable and noncommunicable diseases, nutritional diseases (malnutrition as well as obesity), tobacco smoking, substance use, low physical activity, high risk sexual behaviors, and mental health disorders.^[5] According to a *Lancet Adolescent Health series study*, adolescents today face new challenging issues such social media exposure in addition to being more vulnerable to severe health hazards like substance addiction, STIs, mental health related issues, and other conditions.^[5-8]

The WHO has stated that preventing six interconnected categories of behaviors, encouraged by social and political policies and conditions, can significantly reduce the number of leading causes of disease and death, including injuries, nutritional deficiencies, cardiovascular disease, cancer, chronic lung diseases, depression, violence, substance abuse, and sexually transmitted infections,^[9] which are as follows:

- Dietary behaviors
- Sedentary lifestyle
- Tobacco use
- Behavior that results in injury and violence
- Alcohol and substance use
- Sexual behavior.

Despite the importance of adolescent health, it has received limited attention and progress has been slow in developing and underdeveloped countries. Most adolescents are physically healthy, but some still have significant premature deaths, illnesses, and injuries. In fact, understanding and investing in childhood and adolescence will pay huge dividends in the future in terms of individual wellbeing and national growth and development. Understanding the epidemiology and the most common health risk behaviors adopted by most Saudi Arabian children and adolescents provides the foundation for the disease prevention, primary health care, and population health in the country. Promoting health during this early period of life is key to many social and public health agendas.^[6-9]

Searching literature

We have reviewed the literature on health-related behaviors among children and adolescents (9–19 years old) in Saudi Arabia, including being overweight or obese, dietary behaviors, physical activity, tobacco use, risky sexual behavior, mental illness, and violence. Our findings are presented below. The review was conducted using electronic databases of PubMed and Google Scholar for the period of for the period 2010–2023 and other official websites.

Noncommunicable disease in Saudi Arabia

The Kingdom of Saudi Arabia (KSA) lies in the furthestmost part of southwestern Asia. With a total area of approximately 2,000,000 square kilometers, it occupies about four fifths of the Arab Peninsula. As shown in Table 1, children and adolescents constitute a large proportion of the population in Saudi Arabia.^[10]

Despite considerable improvements in key indicators of population health in the past decades in Saudi Arabia, the Saudi healthcare system still faces major challenges. In particular, the prevention of noncommunicable diseases (NCDs) is a significant challenge to the Saudi healthcare. The Saudi Health Interview Survey/Saudi Health Information Survey (SHIS)^[11] was a nationwide survey administered to a representative sample of Saudi people aged 15 and older. The SHIS was designed to measure the major risk factors likely to lead to chronic illnesses in the population. Table 2 shows the prevalence of the major health risk factors for men and women in Saudi Arabia.^[11]

The growing epidemic of NCDs and the associated premature death, morbidity, and disability have negatively impacted the Saudi national healthcare system. As in many parts of the world, NCDs in Saudi Arabia are causing a surge in the costs of health and social care. NCDs are estimated to currently cost the KSA 18.6 billion USD annually or 2.8% of the GDP.^[12] It has also had a negative impact on socioeconomic development and sustainable development in Saudi Arabia, thereby leading to increasing economic challenges and inequality. It is well

Table 1: Proportion of Saudi Arabian Citizens who are Children or Adolescents

Age Group	Male	Female	Proportion of total population ¹
0–4 years	50.9%	49.1%	10.6%
5–9 years	50.9%	49.1%	10.4%
10–14 years	50.7%	49.3%	9.3%
15–19 years	50.9%	49.1%	8.8%
20–24 years	52.2%	47.8%	9.9%
≥25 years	50.8%	49.2%	51.0%
Total	50.9%	49.1%	100.0%

Table 2: Major health risk factors from the 2013 Survey of Health Information in the Kingdom of Saudi Arabia

Health risk factor	Male	Female	Total
Overweight (BMI ≥25 kg/m ²)	57.5%	61.5%	59.4%
Obesity (BMI ≥30 kg/m ²)	24.1%	33.5%	28.7%
Borderline hypertension	46.6%	34.3%	40.5%
Hypertension	17.8%	12.5%	15.2%
Borderline diabetes	17.0%	15.5%	16.3%
Diabetes	14.8%	11.7%	13.2%
Hypercholesterolemia (cholesterol >6.2 mmol/L)	9.5%	7.3%	8.5%
Dental visit due to teeth complaints	44.0%	53.4%	48.6%
Low physical activity	46.0%	75.1%	60.3%
Current tobacco smoking	23.7%	1.5%	12.2%
<1 serve of fruit and vegetables per day	30.9%	32.4%	31.6%
5+ serves of fruit and vegetables per day	7.2%	8.0%	7.6%

documented that many serious diseases in adulthood have their roots in adolescence. The influence of childhood experiences on health later in life is well recognized,^[3,6-9] with attitudes and behaviors acquired then ‘tracking’ into adulthood.

Children health risk behaviors in Saudi Arabia

Childhood obesity is a serious health problem. The number of children and adolescents who are overweight or obese is increasing in most countries.^[2] Children and adolescents who are overweight or obese are at risk of multiple immediate and long-term diseases, including raised cholesterol, triglycerides, and glucose, as well as type 2 diabetes, high blood pressure, and adult obesity and its correlated outcomes.^[13] According to a national survey in Saudi Arabia (n = 19,317 children aged 5–18 years), the prevalence of obesity and overweight was 11.3% and 23.1%, respectively.^[14] A recent study among 7930 Saudi children and adolescents (aged 6–16 years) reported that the overall prevalence of overweight and obesity was 13.4% and 18.2%, respectively.^[15] The past decade has seen an alarming rise in the number of children and adolescents who are overweight or obese. According to the WHO, overweight and obesity are associated with more deaths worldwide than underweight, and the main cause of overweight and obesity is a lifestyle behavior that leads to energy imbalance.^[16]

Supportive communities and environments are fundamental in shaping individuals’ choices by adapting healthier dietary habits and regular physical activities, therefore preventing overweight and obesity.^[16] Moreover, a recent systematic review and meta-analysis documented that a balanced healthy diet, exercising physical activity, and parental awareness pertaining to body weight in children were the three major factors influencing children obesity status.^[17] Certainly, healthy nutrition and physical activity are central factors for healthy growth and development, and it is a prerequisite for achieving full physical potential and healthy weight. Studies investigating dietary behaviors among Saudi children and adolescents have reported very low consumption of fruits, vegetables, and milk products^[18,19] and high consumption of sweet products and carbonated and energy drinks.^[18,20] Moreover, physical activity provides basic health benefits for children and adolescents, including improved cardiorespiratory function, muscle strength, bone health, maintenance of a healthy weight, and psychosocial benefits.^[2] In addition, several studies have reported that a significant proportion of Saudi children, adolescents, and adults are physically inactive and by far do not meet the recommended guidelines for physical activity levels.^[18,21,22] The high prevalence of unhealthy dietary behaviors and physical inactivity among Saudi adolescents are major public health concern. There is an urgent need for national policies aiming to promoting healthy eating and enhancing physical activity among children and adolescents in Saudi Arabia.^[18-22]

A common health risk behavior among adolescents and young adults is poor or unhealthy sexual practices. Very little is known about sexual behavior, attitudes, and associated factors among

adolescents in Saudi Arabia.^[23,24] In the Saudi society, discussing sexual health-related behavior issues is considered a taboo. Studies exploring sexual health among Saudi population are lacking. One study stated that a considerable number of Saudi adolescents (38%) had experienced sexual contact, while 67% have had friends who had experienced sexual contact and have reported unhealthy negative sexual attitudes.^[23] Moreover, it has been documented that Saudi adolescents have low levels of sexual health-related knowledge.^[24] It has been reported that more than 64% of Saudi adolescents indicated poor or low knowledge levels of STIs and HIV in Saudi Arabia.^[24] Levels of knowledge are predictors of the kind of behavior exhibited by children and adolescents regarding sexual activities. Given the significantly high knowledge gap, it is safe to say that adolescents within the region are barely engaging in safe sexual practices, a fact that predisposes them to several sexually transmitted diseases. However, sexual health-related behavior studies are lacking in Saudi Arabia. Open discussion of sex and sexuality issues can be difficult in some cultures including Saudi Arabia. Moreover, in Saudi Arabia and other Gulf Cooperation Council (GCC) countries (i.e., Kuwait, the United Arab Emirates, Qatar, Bahrain, Oman), sex education is a highly controversial issue. Adolescents need to know how to protect themselves from sexually related diseases and should have the means to do so.^[2] It has been reported in Saudi Arabia that most adolescents believed in the effectiveness of sex education (92.3%) and the reported for the need for school-based sex education (85.6%).^[23]

Mental health issues constitute a major burden of illness and disability among adolescents.^[2] Yet, mental health is one of the most neglected issues in Saudi Arabia, with serious implications for child and adolescent wellbeing. A study with more than 12,000 Saudi school students, aged 10–19 years, reported that 14% reported feeling excessively sad or hopeless and 6% reported feeling excessively worried in the 12 months prior to the survey.^[25] Another study investigated the prevalence of mental disorders among Saudi high-school students (grade 12) and revealed that 48% of the sample suffered from mental disorders (41% in males and 51% in females).^[26] However, this study was limited by a relatively small sample size (n = 354), sampling, and the measures used. A brief overview of the literature on mental illness in Saudi Arabia has indicated that there is insufficient evidence for a precise estimate of the prevalence of mental illness among the Saudi population.^[27] Mental health-related issues are becoming a global concern, and child and adolescent mental health in Saudi Arabia requires proper intervention and management.

Violence is another significant public health issue and among the leading causes of injuries and death in adolescents globally. Globally, interpersonal violence is the third leading cause of death in adolescents,^[2] and its prominence varies considerably between countries. Adolescent violence has a serious, often lifelong, impact on the physical, psychological, and social functioning of both perpetrators and victims.^[28] In addition, bullying as a subcategory of violence may include many forms such as “excluded from activities, hitting, kicking, pushing, choking,

punching, threatening, taunting, teasing, starting rumors, and hate speech.” Unfortunately, data regarding violence among children and adolescents is lacking in Saudi Arabia. Along with the lack of mental health research, research on the effects of bullying on students’ mental health is scarce in Saudi Arabia. A national school-based study including 12,575 adolescents reported that 25% and 20% were exposure to bullying at school and involved in physical violence at school or community.^[29] Many countries, today, are seeking new solutions to provide all schools, students, and parents with support and guidance to tackle such problems. Violence and feeling devalued can increase the risk of developing mental health problems.^[2] Hence, developing life skills in children and adolescents and supporting them with psychosocial assistance in schools and other community settings can help promote better mental health status.^[2]

Tobacco use in any form, which often begins in adolescence, is a major risk factor for morbidity and mortality. It has been documented by WHO that most individuals using tobacco started doing so when they were adolescents.^[2] A school-based study carried out in all 13 regions of Saudi Arabia (n = 6,444) reported a smoking prevalence of 22.1% among male adolescents in Saudi Arabia.^[29] Another study has reported similar results among Saudi adolescents in Riyadh, with 24% of males found to be tobacco smokers.^[30] Smoking habits was found to be positively associated with many personal and social factors, including age, having friends who smoke, having a parent who smokes, perceived poor health, and perceived dissatisfaction with life.^[30] From a recent systematic review study, following the PRISMA Guidelines to determine smoking prevalence among adolescents in Saudi Arabia, it was discovered that it was at a rate of between 2.4% and about 39%, with some of the contributing factors such as peer influence, influence from parents, poor academic performance, and family neglect.^[31] This considerable proportion of adolescent tobacco users in Saudi Arabia results in poor health, premature death, and lower life satisfaction in the long run.

Addressing the gap

Research on child and adolescent health and wellbeing has been overlooked in Saudi Arabia, and there are knowledge gaps that need attention. There is a paucity of data on Saudi adolescents’ sexual-related issues. Evidence is also severely lacking on the prevalence and correlates of substance abuse among Saudi adolescents. Furthermore, there is a critical need for research on children’s and adolescents’ mental health, including factors that lead to poor mental health and the consequences of poor mental health on their general development. As health is influenced by many factors, a clear understanding of children and adolescents’ needs, health determinants, and the health-related behaviors that begin during childhood and adolescence require effective collaborative efforts and systematic surveillance systems, including advanced research methods.

To address these gaps in knowledge, there is an urgent need for reliable population-level monitoring of health-related

behaviors and risk factors among children and adolescents in Saudi Arabia, which is critical for developing and implementing evidence-based effective interventions and program evaluations. Numerous countries participate in international health surveys, such as the Global School-based Student Health Survey (GSHS).^[32] The GSHS was developed by the WHO in collaboration with UNICEF, UNESCO, and UNAIDS and with technical assistance from Centers for Disease Control and Prevention (CDC). There are now 101 countries that have participated in this global surveillance project, with the following aims^[32]:

- Help countries develop priorities, establish programs, and advocate for resources for school health programs and policies
- Determine the prevalence of health behaviors and protective factors
- Allow comparisons across countries regarding the prevalence of health behaviors and protective factors.

Schooling in Saudi Arabia

The Saudi government is the main provider of education and training, even though private schools and public schools also provide education. The MoE is the main provider of basic education (primary and secondary) and higher education (tertiary). Saudi Arabia’s universities, colleges, and research centers also fall under the responsibility of the MoE. Generally, the education system consists of 6 years of basic primary school education (grades 1–6), 3 years of middle school (grades 7–9), and 3 years of high school (grades 10–12).

A few would disagree that the education system in Saudi Arabia has plenty of room for improvement. There have been many challenges facing primary and secondary school teachers and administrators in Saudi Arabia, such as inadequate recruitment, excessive teaching load, insufficient teaching and training resources, and infrastructure problems. The challenge for Saudi policy makers and educators is no longer getting children into school but rather improving the overall quality of education, school environment, and school services, as well as addressing students’ needs. The quality of education must, therefore, be of central interest to Saudi policymakers and the public. Indeed, education and health are inextricably linked^[33]:

- Healthy young people are more likely to learn more effectively.
- Health promotion can assist schools in meeting their educational attainment targets and social aims.
- Young people who feel good about their school and who are connected to significant adults are less likely to undertake high risk behaviors
- Schools are also worksites for the staff and can practice and model effective worksite health promotion for the benefit of all staff and, ultimately, the students.

Schools can better fulfill their education objectives if they have addressed the psychosocial issues that interfere with students’ learning. Therefore, schools should incorporate a focus

on psychosocial, developmental, and social services that facilitate a positive health status among school-aged children.^[33]

School and health promotion

As defined in the Ottawa Charter for Health Promotion,^[34] health promotion is the “*process of enabling people to increase control over, and to improve, their health*”. Certainly, one of the main cornerstones for health promotion is health education. Health promotion programs and education provide opportunities for both individuals and communities to obtain the necessary information/skills required to make health decisions or change health behaviors.^[34] Effective school health programs can be one of the furthestmost cost-effective investments a nation can make to instantaneously promote health and advance education.^[6] In Saudi Arabia and other countries, school is a unique setting for health promotion for many reasons. First, most children are enrolled and go through the schooling system. Second, on average, children spend 6–8 hours at school and 5 days a week. Third, schools host and gather many children from diverse backgrounds. Fourth, school health programs can reduce the prevalence of health risk behaviors and promote health and wellbeing among youth and have a positive effect on academic performance.^[35] Additionally, school environments can affect students’ health and academic outcomes.^[36]

In some GCC countries, the Ministry of Health (MoH) is responsible for school health programs, and in others, it is the responsibility of the MoE. Therefore, the work systems are accordingly different, and there is wide variation in the health services offered by schools in the GCC countries. In well-developed countries, schools usually employ a full-time certified health professional (e.g., school nurse, public health nurse, etc.) who spends most of his or her day dealing with students’ health problems and performing health assessments, screenings, and special procedures ordered by a child’s personal doctor. They also play a central role in promoting a healthy and safe school environment.

Adolescent behaviors are influenced at the individual, peer, family, school, community, and societal levels.^[8] Moreover, schools are a significant social and physical environment and can play an important role in enhancing students’ health, including healthy dietary behaviors, increasing physical activity, and improving or maintaining psychological health. Therefore, school-based interventions are significantly important and have proven to be effective and cost-effective in several areas.^[4,35,36] Because many sectors of society contribute to adolescent health, safety, and wellbeing, a collaborative effort that engages multiple partners is necessary. A comprehensive model for school-based health requires a joint effort from school authorities, parents, teachers, school social workers, psychologists, and medical professionals. Thus, the Saudi MoE should play an active role in developing and promoting healthy behaviors through comprehensive school-based intervention programs. Screening of adolescent health and monitoring health-related behaviors and risk factors

on a regular basis could be an effective tool in controlling existing diseases and updating the occurrence of any new health concerns. To have the greatest constructive impact on children and adolescent health, families, schools, government agencies, community organizations, and community members should effectively collaborate in mutual vision of enhancing children and adolescents’ health and therefore should work together.^[37]

The challenges and global response

Addressing and tackling the public health matters and issues facing children and adolescents is challenging. Investment in children and adolescents’ health through school-based health promotion services and programs is a cornerstone for better public health future for any country. The health and wellbeing of children and adolescents have a major impact on the overall health of society as today’s children and adolescents are the tomorrow’s labor force, citizens, and parents. Furthermore, good health is critical for cognitive ability and learning and can boost attendance and educational achievement. Children and adolescents ought to have the opportunity to have a safe and healthful transition from childhood to the youth period and from youth to adulthood, geared up with the essential competencies and abilities to make a terrific contribution to their own health and to their communities and country in future. To promote child and adolescent health in the best way possible, effective policies should be developed and implemented to address their specific health needs. However, first, we need to strengthen the collection of health information and baseline data by developing and conducting systematic surveillance systems such as the Youth Risk Behavior Surveillance System (YRBSS)^[38] and Health Behavior in School-aged Children survey (HBSC)^[39] and make better use of data in decision-making. Both monitor several categories of health-related behaviors that contribute to the leading causes of death and disability among youth and adults, including:

- Oral health-related behaviors
- Unhealthy dietary behaviors
- Insufficient physical activity
- The prevalence of overweight and obesity
- Smoking and tobacco use
- Alcohol and other drug use
- Sexual behaviors
- Behaviors that contribute to unintentional injuries and violence
- Mental health status and related protective and risk factors.

These behaviors can lead to dangerous outcomes that not only threaten an adolescent’s own health but also can endanger others and continue throughout adulthood.

Several international initiatives recognize the critical role of schools in offering the foundation for guaranteeing the healthy growth of children and adolescents, including the WHO’s Global Action Plan for the Prevention and Control of NCDs 2013–2020,^[40] the Global Strategy for Women’s, Children’s and Adolescents’ Health,^[41] and the Shanghai Declaration

on promoting health in the 2030 Agenda for Sustainable Development.^[42]

The WHO published a most important report, “Global Accelerated Action for the Health of Adolescents (AA-HA!): Guidance to support country implementation”.^[43] In this document, the WHO outlined how they aim to assist governments in developing and implementing their plans to act in response to the health needs of children and adolescents in their countries. This document targets national-level policy makers and program managers to assist them in monitoring, planning, implementing, and evaluating health programs. Overall, the WHO carries out a range of functions to improve the health of young people, including the following:

- Production of evidence-based guidelines to support health services and other sectors
- Making recommendations to governments on children and adolescent health
- Documenting progress in children and adolescent health and development
- Raising awareness of health issues among young people for the public and other interested stakeholders.

The 2030 Agenda for Sustainable Development and its Global Strategy for Women’s, Children’s, and Adolescents’ Health offer a distinctive opportunity for accelerated action for the health of children and adolescents. Also, investment in children and adolescent health is crucial to achieve the 17 Sustainable Development Goals which relate to children and adolescents’ development, health, and wellbeing directly or indirectly.^[44]

Conclusions

In any country and among different communities, children and adolescence represent unique periods in the life cycle, bringing both challenges and opportunities. Although this age group is generally healthy, there are significant health issues involving their health needs, risky behaviors, mental health, sexual health, substance use, and puberty. The recent focus of policies and resources on improving the health and quality of health care for children and young people is an encouraging sign that their special needs are being recognized.

Many behaviors that start in these periods have long-term health implications; therefore, promoting healthy behaviors during childhood and adolescence is critical. In Saudi Arabia, there is a need for a better understanding of the social and cultural determinants of children and adolescents’ engagement in risky behavior as well as of protective factors. Understanding school-age children health disparities and children and adolescents’ experiences of disruptions and adverse experiences as interconnected problems can inform school and community initiatives that promote adolescent health and wellbeing. Investment in child and adolescent health through better school-based health services and interventions is important, both because it is a unique phase of human development and because of the disease and injury burdens that are borne by

children and adolescents. However, for the investment to be evidence-based and cost-effective, there is a need for more detailed and systematic national data pertaining to child and adolescent health issues in Saudi Arabia.

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Conflicts of interest

There are no conflicts of interest.

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