

Social ecological model as a framework for understanding screen time and sedentary behavior among Arab adolescents

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Context

Adolescence is characterized by substantial physical and psychological changes.^[1] Adolescents engage in risky behaviors and experience high rate of injury and death.^[2] The heightened use of electronic devices by them has complicated the picture further.^[3] These devices increase their screen time, entice them to snack on unhealthy food, and promote sedentary behavior. Extended screen time impacts their eyesight, alters brain function, produces cardiovascular stress, and gives rise to musculoskeletal disorders.^[4] Besides these, there are indirect effects such as sleep disruption, insomnia, aggression, delinquency, addictions, social anxiety, obesity, and a decline of physical and mental health.^[5] There is a dose-response relationship between screen time and negative health outcomes, i.e., the higher the screen time the worse are the health outcomes.

The Problem: Screen Time

Arab adolescents may not be any different, in terms of screen time, than those from the developed countries. The Arab Gulf countries are heavy consumers of electric gadgets (e.g., cell phone, computer, television, PlayStation, etc.), thanks to a high per capita income and the adoption of a free market economy. Although the proportion of the Arab adolescents who own devices (i.e., laptop, tablet, or smartphone) is unknown, available data have shown that 87% of US adolescents have a laptop or desktop and 58% have a tablet (the majority of those who do not own a device have access to one).^[3]

Few studies have examined screen time and physical activity among Arab adolescents. Two Emirati studies and one Bahraini study reported high levels of screen time (range >2 h per day: 37–85%).^[6-8] However, the largest and most comprehensive

data came from the Arab Teens Lifestyle Study (ATLS), which included approximately 2800 adolescents from Saudi Arabia.^[9] It showed that boys were more likely to be physically active than girls (55% vs. 22 %). Girls were more likely to be sedentary (defined as screen time >3 h per day) than boys (82% vs. 70 %); the proportion was even higher (girls = 91%, boys = 84%) when standard cutoff value (>2 h per day) was applied. Despite the strengths of the ATLS study, the data are now outdated (data collection took place in 2009/2010) and more current estimates are warranted.

Social Ecological Model (SEM) as an Explanation of Screen Time Behavior

Screen time is a complex public health problem because: (a) Its presence is ubiquitous, (b) its clustering with other unhealthy behaviors, and (c) its varied short- and long-term health consequences. It may be helpful to rely on theory to understand this problem so that this can be addressed effectively. SEM provides a framework that captures the influencing factors of a specified health behavior at various levels.^[10] According to SEM, there are multiple levels of influence on behavior and these influences interact across different levels (2 of 4 core principle of SEM).^[11,12] The levels include intrapersonal, interpersonal, organizational, community, and public policy. Theoretically, each level independently acts on the outcome, and the effect accentuates further when the influencing factors interact across levels. For example, physical activity may not be included in a school curriculum; hence, an adolescent attending that school may not engage in physical activity. Since most of his friends attend the same school, they also are likely to have low levels of activity. Although an adolescent in this scenario may have some interest toward physical activity, his or her motivation is reduced since the interpersonal (i.e., friends) and the organizational (i.e., school) support is not present;

thereby, creating a negative interaction. The absence of quality recreational facilities in the community may create a barrier, thereby exacerbating the risk for sedentary behavior in this scenario.

Recommendations

The power of SEM goes beyond diagnosing the problem; the model is “to inform the development of comprehensive intervention approaches that can systematically target mechanisms of change at several levels of influence.” It is hypothesized that interventions that target multiple levels simultaneously should be able to have a greater impact on the behaviors; hence, multilevel interventions should be more effective to change and to sustain behavior than single-level interventions (3rd core principle of SEM).^[10] A proposed multilevel intervention for Arab adolescents could target each of the following levels:

Intrapersonal: To conduct health promotion campaigns to encourage physical activity and to promote the use of activity tracking devices and apps (i.e., FitBit, GoogleFit, etc.)

Interpersonal: To promote group-based activities such as team sports and group exercise classes.

Organizational: To introduce physical activity into the school curriculum as well other extracurricular activities after school hours.

Community and public policy: To improve the quality and quantity of recreational facilities inside the schools and in the community.

Data on screen time and other sedentary behaviors need to be updated regularly. One proposal is to develop a national survey with an aim to collect data on a periodical basis (e.g., every 5 years). This will allow researchers to analyze these behaviors over time, to examine their variation across factors (e.g., gender, geographical location, socioeconomic status, etc.), and to make comparisons with data from other countries, regionally and globally. More importantly, interventions need to be developed and tested to tackle this public health problem. Introducing physical activity and health education into the

school curriculum are an essential component to any multilevel intervention and will likely reach the largest number of students. It is highly recommended that interventions and/or school-based physical activity programs should be grounded in theory such as the SEM that aims to influence behavior at multiple levels.

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