Health Education in Schools as a Perpetual Priority to Prevent Kidney Disease

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Kidney Int Rep (2020) 5, 2130–2132; https://doi.org/10.1016/j.ekir.2020.10.024
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See Clinical Research on Page 2256

Elimination of the worldwide epidemic of chronic kidney disease (CKD), especially that which is a sequel of cardiovascular or metabolic derangements, requires concerted and aggressive prevention strategies. Increasing incidence of diabetes, obesity, and hypertension among younger adults and even adolescents requires then that these strategies must be effective across the lifespan, and perhaps even more focused among young populations. Public health organizations worldwide acknowledge this fact and identify that schools are a key opportunity to convey knowledge, teach skills and alter cultural norms for youth. The effects of these interventions will not only be carried through an individual’s life course, but will also affect parents, staff, communities and beyond.

The importance of including health education as a foundational component of educational curricula policy has arguably been asserted relatively recently, with the World Health Organization offering international strategic recommendations as part of its Global School Health Initiative launched in 1995.¹ In the United States, prioritization and implementation of health education in schools has been challenging at best. National Health Education Standards were first published by the Centers for Disease Control and Prevention in 1995, updated in 2004, and focused on ensuring that learners comprehend concepts related to health promotion; analyze influence of people, technology, and other factors; and, importantly, demonstrate skills to access, interpret, communicate, and use information or resources to enhance health.² These standards align fundamentally with ensuring that people have high health literacy, and the 2010 U.S. National Action Plan names as a goal systemwide inclusion of standards-based, developmentally appropriate, health and science curricula throughout the educational timeline.³ Yet although few argue directly against these laudable goals, there remains skepticism about its importance and future impact against the many other socioeconomic barriers to optimal health.

Education, secondary through high school and beyond to postgraduate advanced education, is undeniably related to health through complex individual, relational, community, and policy pathways. Educational attainment has been demonstrated to be consistently related to health outcomes, including kidney disease, and key pathways hypothesized to explain these associations include the acquisition of knowledge leading to healthy choices and actions; employment supporting income, wealth, and access to resources including health insurance; and the cultivation of social expertise, such as building and engaging a social network for resilience and problem-solving.⁴ Few studies examine the interplay between these pathways to further understanding about where to direct programming and resources.

In this prospective cohort study, Tripathy et al.⁵ examined participants of the Coronary Artery Risk Development in Young Adults (CARDIA) study, a prospective cohort study that enrolled young adults in 1985 and 1986 from 4 cities in the United States, and followed them for 30 years. This substudy included cohort participants who had information about educational attainment and laboratory assessments of kidney health at the 10- and 20-year visits. This large cohort was diverse in that 55% of participants were women and 47% were Black. Findings confirmed prior observations that lower educational attainment was associated with a higher risk of developing CKD; however, this was in part explained in regression models by...
other factors, including income, insurance, health behaviors, and health status. This study advanced understanding in several important ways, including its longitudinal design over a long observation period and sequential analyses to provide information about the interplay between key pathways.

Similar to the findings in this study, using a population-based longitudinal study of adults in Ireland, Ma et al. demonstrated that an additional year of schooling decreased the probability of having hypertension and diabetes. Moreover, there was a significant correlation between more years of schooling and higher levels of physical activity, as well as being a nonsmoker. The impact of smoking is of particular interest in the CARDIA study. Although the participants had a relatively low prevalence of diabetes or higher systolic blood pressures, the proportion of current smokers was 37% among those with a high school education or less. This finding is similar to the general population rate for the period, and much lower than the other educational attainment categories. This key factor is included in analysis model 3, along with physical activity; however, as suggested by prior studies involving more than 65,000 patients worldwide, it is likely that this may be a more important explanatory variable. This may be particularly relevant for people with hypertension without concurrent diabetes, and a limitation of the CARDIA study is the lack of time-updated information about systolic blood pressure or development of hypertension by the 20-year visit time point. Regardless, in large part due to advocacy efforts, the rate of current smokers in the United States has improved to ~14.5%; nonetheless, more work is necessary, and school-based early programming continues to be a priority target.

An important consideration is the timing of CARDIA’s initiation and the recognition that the participants in this study were in secondary school in the mid-to-late 1970s. Other important policy changes occurred at that time, such as the U.S. landmark COBRA (Consolidated Omnibus Budget Reconciliation Act), which required employers to offer partially subsidized health insurance to employees who lost their jobs. This allowed many Americans access to health care, the results of which are hard to quantify but are undeniably significant. Few studies are available to compare the magnitude of the association between educational attainment and incident CKD risk prospectively. This also makes historical period effects even more difficult to examine. The National Longitudinal Study of Adolescent to Adult Health (ADD Health) is a National Institutes of Health–funded longitudinal study of a nationally representative sample of more than 20,000 adolescents who were in middle or high school during enrollment in 1994–1995. Similar to CARDIA, they have been followed over the subsequent 25 to 30 years, and recently, Wave V prioritized examination of kidney health markers among the participants. Although just a decade younger than those in CARDIA, this cohort is also rigorously phenotyped with robust characterization of individual participants, family members, and communities where they reside. Educational attainment is among these variables and will enable novel analysis including the interactions between genetics, geography, or determinants related to place, social contexts, and behavioral factors and health among diverse representative participants. The complex layers of influences on health require a similarly woven framework to direct action.

It was only as recently as 2014 that the Centers for Disease Control and Prevention and ASCD (a nonprofit organization leading curriculum development for schools) collaboratively developed and promoted the Whole School, Whole Community, Whole Child (WSCC) framework (Figure 1). This framework emphasizes that the child is at the center and is not only healthy, but safe, engaged, challenged, and supported. This occurs through health education and a full complement of 9 other recommended strategies to promote physical, social, and emotional wellness. Notably, this requires that the community, including members of the school organization itself surround the program. Although the percentage of attainment of a bachelor’s degree or higher has risen from 5% to nearly 30% (2010) in the past 5 decades, educational attainment and quality of education remains one of the most important social determinants of health and a key driver of health inequities.

Although it is a key goal to improve health education within the school curricula and aim for maximal educational attainment for all, it is equally important to develop organizational programming to overcome gaps in health literacy. Low health literacy is common among adults, increases in prevalence with age, and has been associated with less knowledge and self-efficacy specific to kidney health. Underrepresented minorities are particularly vulnerable to the impact of disparities in social determinants, and it is important to note that CARDIA participants identified either as Black or White, which in 1980 also represented ~95% of the U.S. population. However, in 2010, this decreased to 85%, with more Americans...
identifying as Asian, “some other race,” or “2 or more races.” The increasingly recognized racial diversity of the United States requires deliberate attention to addressing cultural drivers of health and more specifically the interactions within health care delivery. This too is a requirement of eliminating barriers related to health literacy. The National Academies of Medicine Roundtable on Health Literacy recommended that research specifically to health literacy in adolescents and young adults is needed to robustly respond to the need for prevention programming at an earlier point in the education timeline. Achieving health outcomes requires cultural competence, high-quality kidney health care for individuals and across populations. Kidney clinicians, as innovators and experts in programmatic continuous quality improvement, are poised to expand our footprint and successfully address this most critical social determinant of health through united stakeholders delivering innovative kidney health education across all settings, including schools.5

DISCLOSURE
All the authors declared no competing interests.

SUPPLEMENTARY MATERIAL
Supplementary File (PDF)
Supplementary References.

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