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In Search of 21st -Century High Quality Health Education Teachers

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Abstract

Purpose - Healthier students learn better which improves academic achievement and educational attainment. Teachers with subject area knowledge and certification in their teaching content areas positively contribute to student academic achievement. The purpose of this study is to identify trends from 2003 through 2016 in academic majors and subject-area certifications, licensures, or endorsements of K-12 public school staff in the United States who were teaching at least one health education class during this century.

Design/methodology/approach - Data were extracted from a comprehensive nationally representative survey of school employees conducted regularly by the National Center for Educational Statistics of the United States Department of Education.

Findings - Approximately 60% of health education teachers indicated they were certified in health education during the study period. Nearly two-thirds of staff teaching health education did not have an academic major in health education. These findings suggest an ongoing trend of granting teachers state certification in health education devoid of any academic major in health education. Other increasing trends include staff with an academic major in physical education and no academic major in health education teaching health classes; and, certified in physical education teachers who were not certified in health education teaching health classes.

Originality – Findings are a call to action to hire health education teachers who not only have certification in health education but also an academic major in health education, which is imperative to increase healthy behaviors, reduce risk behaviors, and increase academic achievement among youth.

Keywords school health, health education, quality teachers, health teachers

Article classification Original Article, Research paper

Background

Children and adolescents in the United States having low health literacy are estimated to range from 9-41% with lower rates among minority groups (Kutner *et al.*, 2006). Limited health literacy has a profound effect on managing medical conditions, engaging with healthcare providers, overall reduced health status and health outcomes, and mortality (Baker *et al.*, 1997; Lloyd *et al.*, 2006; Berkman *et al.*, 2011; Easton *et al.*, 2013). In 2019, The United States Department of Health and Human Services (USDHHS) instituted the National Action Plan to Improve Health Literacy identifying the significant problem of inadequate health literacy among kindergarten-12th grade (K-12) students (USDHHS, 2010). The role of the health educator is to provide not only health education, but also assess community needs, develop health education programs, teach health condition management, and evaluate program effectiveness (Bureau of Labor Statistics, 2020). Health teachers in primary and secondary school, K-12, settings are specifically trained to serve as health educators with common health education topics including but not limited to good hygiene, benefits of healthy lifestyles, safe sex, effects of drugs of alcohol abuse, healthy relationships, and mental health (Auld *et al.*, 2020; Lee *et al.*, 2020). Health literacy is related to overall literacy (USDHHS, 2010). Both are affected by social determinants of health such as race and ethnicity, age, socioeconomic status, and education (USDHHS, 2010).

Healthier students learn better which improves academic achievement and educational attainment (Basch, 2011; Centers for Disease Control and Prevention [CDC], 2014). Evidence consistently supports a positive association between educational attainment and adult mortality rates (Kaplan *et al*., 2015; Olshansky *et al.*, 2012; Sasson, 2016). Due to this link between health and education, schools offer a suitable environment to improve educational attainment and overall health simultaneously. Health education provided in U.S. schools, as defined in the Report of the 2011 Joint Committee on Health Education and Promotion Terminology (2012), is any

combination of planned learning experiences using evidence based practices and/or sound theories that provide an opportunity to acquire knowledge, attitude, and skills need to adopt and maintain healthy behaviors. The school health educator/teacher is expected to provide youth with the knowledge and skills to empower them to practice healthy behaviors and reduce health risk behaviors, thus improving their academic performance (Banspach *et al.*, 2016; Basch, 2011; Bradley and Greene, 2013).

National policies and guidelines in the United States exist to promote health in schools. The Every Student Succeeds Act (ESSA) and the National Association of State School Boards of Education (NSBA) encourage state boards of education to work with state education agencies and departments of health to set curriculum standards for health education and provide for planned, sequential health education curriculum and instruction (Fobbs, 2015). Further, Healthy People 2020 emphasizes the role of schools in promoting quality of life, healthy development, and healthy behaviors including objectives, Early and Middle Childhood (EMC) and Educational and Community-Based Programs (ECBP), specific to health education in schools (Office of Disease Prevention and Health Promotion (ODPHP), 2020). Common themes of Healthy People objectives include school health education, National Health Education Standards, priority areas of comprehensive school health education, and promotion of overall health and wellness (ODPHP, 2020). In addition, the National Association of Chronic Disease Directors (NACDD) (2017) provided a guide to implement the Whole School, Whole Community, Whole Child (WSCC) model in schools. The WSCC model uses a collaborative and integrated approach to address barriers and support related to health and learning (NACDD, 2017).

CDC National Health Education Standards include health education provided by qualified, trained teachers to help students attain the knowledge, attitudes, and skills needed to make

healthful decisions, achieve health literacy, and advocate for the health of others (CDC, 2019). In general, qualified teachers, often synonymous with quality teachers, are both knowledgeable about curriculum content and skilled in implementing subject-specific instructional strategies (CDC, 2020a; Darling-Hammond, 2000; Stronge, 2018). Two widely used standards that describe quality teachers are demonstrated subject-matter competency through passing a subject knowledge test or having a baccalaureate degree or better in the subject or having full state teacher certification or licensure in the area they are teaching (Darling-Hammond, 2006; Elfers *et al*., 2004; Ingersoll, 2002; U.S. Department of Education, 2015). Evidence supports the relationship between teachers' subject area knowledge and certification and student academic achievement (Feng and Sass, 2013, Darling-Hammond *et al*., 2005, Darling-Hammond, 2000, Andersson *et al*., 2011, Clotfelter *et al*., 2007, Wayne and Young, 2003). For example, U.S. Department of Education data was used to demonstrate one of the strongest correlates of positive student achievement was having a teacher certified in the subject area they were teaching (Darling-Hammond *et al.*, 2000).

Subject area knowledge, another element of quality or qualified teachers, includes content knowledge as well as specific topic knowledge and classroom management (Stronge, 2018). Teachers' professional knowledge is necessary for effective teaching (Childs and McNicholl, 2007; Wenglinsky, 2002; Yeh and Santagata, 2015). Evidence shows teaching effectiveness required a combination of both content knowledge and the ability to analyze student thinking (Yeh and Santagata, 2015, Hill *et al*., 2005), teacher academic major and professional development in higher-order thinking skills (Wenglinsky, 2002), and reported level of subject area knowledge influences pedagogical practice and effectiveness of a lesson (Childs and McNicholl, 2007). Overall, empirical evidence supports student learning and academic achievement is positively

impacted by teachers who are not only are knowledgeable about how students learn but are also knowledgeable about subject content and principles of content-specific effective instruction.

Finally, the importance of subject area knowledge and teacher training, certification, licensure, or State endorsement in health education are reflected in Healthy People 2020 objectives EMC-4.1 and 4.2 (ODPHP, 2020). As of 2014, EMC 4.1 and EMC 4.2 objectives show a shift from newly hired staff who teach health instruction having an undergraduate or graduate to certification, licensure, or State endorsement (ODPHP, 2020). Nationally, in 2016, the School Health Policies and Practices Study (SHPPS) found 78.4 percent of school districts reported they had adopted specific staffing policies that newly hired high school health education teachers would be state-certified in health education and 67.8 percent of school districts had adopted this policy for newly hired middle school health education teachers (CDC, 2107). More recently, Healthy People 2030 (ODPHP, 2020), designates school health education as a high-priority public health issue. One goal is to increase the proportion of secondary schools that require students take at least two health education courses between grades six and 12. This update continues the recognition and support for the need to have high quality health teachers to teach health courses designed to increase healthful behaviors and prevent risk behaviors among youth.

In recognition of the effects of low health literacy, the role of the health educator/teacher in schools, subject area knowledge and teacher certification as characteristics of quality health teachers, and the national goals of Healthy People 2020 that call for staff teaching health education to have academic training and certification in health education, this study aimed to evaluate trends beginning early in this century and answer the questions 1) what percent of health education teachers had an academic major in health education teachers per school year? and 2) what percent of health education teachers were certified, licensed, or endorsed in health education?

The purpose of this study is to identify trends from 2003 through 2016 in academic majors and subject-area certifications, licensures, or endorsements of K-12 public school staff in the United States who were teaching at least one health education class during this century.

Methodology

Data for this study were extracted from four consecutive administrations of the National Teacher and Principal Survey (NTPS) previously titled the Schools and Staffing Survey (SASS), This national survey is conducted regularly by the National Center for Educational Statistics (NCES) of the U.S. Department of Education to provide descriptive data on the context of elementary and secondary education. Some core topics of the NTPS are teacher preparation, classes taught, school characteristics, and demographics of the teacher labor force. These data are nationally representative of school employees in the United States (NCES n.d.). Teachers' responses to questions about their education and certification were included in this study. Responses from four survey years (2003-2004, 2007-2008, 2011-2012, and 2015-2016) were compared to determine trends in health education teachers' academic majors and subject-area certifications during this century. The most current 21st-century data available from NCES at the time of this were used.

Participants

Teachers were defined as staff members in United States traditional public, non-charter schools who taught students in any of the school grades K–12. Teachers were included in this study on the basis of their teaching at least one health education class. Small variations in the sampling methodology were evident for each administration of the NTPS, but the design was

established to support this type of longitudinal analysis. (Cox *et al*., n.d; Cox *et al*. 2016). Table I describes the final sample details from each survey year include in this study.

[Insert Table I]

Instruments

The 2003-04 year was chosen as a baseline because it asked respondents about health education as a distinct subject area. Previously, health education was combined with physical education into one category.

The NTPS Teacher Questionnaires consisted of multiple sections (NCES, n.d.). For this study, questions pertaining to education and certification were used. Education was assessed by responses to items that asked teachers to list major fields of study for their baccalaureate degrees, advanced degrees (master's and doctorate), and educational specialist degrees. Teachers were also asked to self-report their state certifications, licenses, and endorsements.

Procedure

As described by Cox *et al.* (2016), the objective of the NTPS survey sampling method was to produce a sample that could be generalized to represent the population of U.S. public school teachers as a whole. Teachers were defined by the NCES as staff members who teach regularly scheduled classes to students in any of grades K–12. Districts selected within the sample provided electronic teacher roosters for inclusion in the sample. Data were collected using paper forms, online surveys, and telephone follow-ups to reduce non-response bias. Response rates were generally very high. The NCES undertook post-hoc analysis and applied weighting variables to correct for unit non-response for some NTPS survey strata (Cox *et al.*, n.d.). In addition, NCES designed weights and sample methodologies to support trend analysis among NTPS (Cox *et al.*, n.d.; Cox *et al.*, 2016). Data were expressed as population estimates, with standard errors and 95%

confidence intervals to indicate the confidence in the estimated parameters. As a result, all weighted samples were nationally representative of public school teachers in the United States.

To identify academic major, a variable was created to classify respondents as "health education degree holders" if they reported attaining a bachelors, masters, Ph.D., or education specialist degree in health education. To identify health certification, a variable was created to classify respondents as “health certification holders” if they reported they were certified, licensed, or endorsed in health.

Data Analysis

For this study, descriptive statistics were used to identify the weighted frequencies of teachers’ academic majors and subject-area certifications. Tables and discussion in this article used these weighted data for the presentation of frequencies and calculation of percentages along with the upper and lower boundaries of 95% confidence interval as obtained using the weighted analysis techniques described above.

Results

Trends in academic majors and subject-area certifications, licensures, or endorsements of K-12 public school staff in the United States who were teaching at least one health education class during this century are described below. First, health teachers with health major addresses the question “what percent of health education teachers had an academic major in health education teachers per school year?” Then, health teachers with health certification addresses the question “what percentage of health education teachers were certified, licensed, or endorsed in health education?”

Health teachers with academic health major

The first purpose of this study was to describe the trends in the percentage of health teachers who had an academic major in health education. Subjects included in the sample were fulltime equivalent teachers and taught at least one class in health education during the survey period. Three trends were identified (Table II). First, teachers who held any college degree in health education declined from a high of nearly 39% in 2007-2008 to 32% in 2015-2016. Second, the percentage of health teachers holding no degree in health education but any degree in physical education increased every year during the study period from 30% to over 35%. Third, the remaining teachers of health education that held degrees in areas other than health education or physical education did not change from approximately 28% beginning 2007-2008 through 2015-2016. Overall, data show a trend of fewer health education teachers having an academic major in health education. Conversely, health education teachers with an academic major in physical education and no academic major in health education has increased, to such a great degree, that by the 2015-2016 school year, more physical education teachers with no academic major in health education were teaching a health class than teachers who did have an academic major in health education.

[Insert Table II]

Health teachers with health certification

Another purpose of this study was to describe trends over the 21st century regarding the percent of staff teaching health education who were certified, licensed, or endorsed in health education. Subjects included in the sample include respondents who reported they were certified in their state to teach health education and were teaching at least one health education class; specifically, the percentage of K-12. Notably, during the study period, nearly 40% of staff teaching health education reported no state certification in health education, and therefore were teaching out-of-subject (Table III). This trend increased during the 21st century; whereas, the percentage of

health teachers who reported they were not certified in health education certification, was approximately 12% in 2003-2004 and increased to nearly 17% in 2015-2016. Over the period of this study, an increasing trend of health teachers who were certified in both health education and physical education was discovered. Notably, staff teaching health education were most likely to be certified in both health education and physical education. The percentage of staff teaching health education who were certified in health education and physical education increased from approximately 40% in 2003-2004 to nearly 43% in 2015-2016. A declining trend exists for staff teaching health who were certified in health education, with no additional certification in physical education. As results show, health teachers certified in health education, with no additional certification in physical education, declined from 17% in 2003-2004 to 15% in 2015-2016. In summary, 21st-century data show an increase of health education teachers who have certification in both physical education and health education and fewer certified health education teachers that do not also have physical education certification.

[Insert Table III]

Discussion

Results from this study showed a longitudinal trend throughout the 21st century for a decline in the percentage of health teachers who had an academic major in health education at the undergraduate or graduate level as well as the percentage that were certified, licensed, or otherwise endorsed to teach health education. This indicates, overall, K-12 health education classes were not staffed with qualified or quality health teachers.

The percentage of health teachers who had an academic major in health education declined from 39% in 2007-2008 to 32% in 2015-2016 (Table II). The evidence from both 2003-2004 and 2015-2016 indicates an ongoing trend of nearly 64% of staff teaching health education not having

an academic health education degree (Table II). Health education has its own unique national learning standards for K-12 youth (CDC, 2019). There is a substantial body of content, professional knowledge, and pedagogy specific to health education that emphasizes the development of health literacy among youth (CDC, 2020b). Lower student achievement occurs when students are taught by teachers with out-of-subject certification (Andersson *et al.*, 2011; Clotfelter *et al.*, 2007; Darling *et al.*, 2005; Feng and Sass, 2013; Wayne and Youngs, 2003). Due to ample empirical evidence that subject area knowledge positively influences effectiveness of a lesson and student academic achievement in that subject (Childs and McNicholl, 2007; Hill *et al.*, 2005; Stronge, 2018; Wenglinsky, 2002; Yeh and Santagata, 2015), along with persistently low levels of health literacy among youth (DeWalt and Hinks, 2009) findings suggest most staff teaching health education lack the professional knowledge necessary for effective teaching in health education.

Certified health teachers increased from 56% in 2003-2004 to upwards of 60% in 2007-2008, 2011-2012, and 2015-2016 (Table III). Taken together, these findings suggest a trend of granting teachers state certification in health education devoid of subject matter competency as indicated by an academic major in health education (Childs and McNicholl, 2007; Hill *et al.*, 2005; Stronge, 2018; Wenglinsky, 2002; Yeh and Santagata, 2015). Considering low health literacy among United States youth (DeWalt and Hinks, 2009), data suggest that states are certifying teachers who have not acquired a level of subject-matter knowledge associated with effective teaching.

This study identified a decline in health education teachers that had an academic major in health education, along with a steady increase in the percentage of health education teachers who had an academic major in physical education (Table II). In addition, there was an increase in the

percentage of staff teaching health education who were certified in physical education and not certified in health education (Table III). The SHPPS (CDC, n.d.), reported a similar trend at the school-level. The percentage of schools in which health education was taught by physical education teachers or specialists increased from approximately 50 percent to 65 percent between 2000 and 2014 (CDC, n.d.). These increasing trends of staffing health education classes with teachers who had an academic major in physical education and not in health education or who were certified in physical education and not in health education are disconcerting. Physical education and health education are two distinctly different disciplines with a substantial body of content, professional knowledge, and pedagogy specific to physical education that emphasizes the development of physical literacy or health literacy, respectively (Birch *et al*., 2019). Health education and physical education have their own unique national learning standards for K-12 youth (Birch *et al*., 2019). Both the WSCC model and the U.S. 2015 ESSA legislation lists health education and physical education independent of each other, further emphasizing they are separate and distinct subjects (Birch *et al*., 2019). Overall, results of this study suggest that school districts in the U.S. are increasingly hiring staff to teach both health education and physical education, which is therefore requiring their teachers to take on an additional responsibility of maintaining professional expertise in two separate and unique academic disciplines.

Most concerning is having health education classes taught by teachers with no health education certification, which is characterized as out-of-subject teaching. As previously described, lower student achievement occurs when students were taught by teachers with out-of-subject certification (Andersson *et al.*, 2011; Clotfelter *et al.*, 2007; Darling *et al.*, 2005; Feng and Sass, 2013; Wayne and Youngs, 2003). Furthermore, teachers with no academic major in health education lack subject area knowledge of a qualified health teacher. Overall, this study showed an

increasing trend during the 21st-century of staffing health education classes with teachers who had an academic major in physical education, rather than health education.

For each survey year, NCES used a cluster sampling design to produce a sample that would support generalization to the entire population of K-12 public school teachers in the United States. The complex design of the sampling strategy and subsequent assignments of replicate weights allowed for generalization of subsamples of the population. Each survey sample used in this study was a subsample of the larger national frame. However, this study was not without limitations. While generalization was at the national level, there was a higher possibility that design-related bias was introduced into the results. Subjects self-reported the data used to measure postsecondary education and state certification. Data were subjected to a series of computer edits related to consistency of responses and deletion of questions that should have been skipped as per questionnaire directions. These NCES edits were reviewed by external analysts. External analysts for NCES also imputed missing data. Imputed data underwent computer edits to verify inputs were consistent with existing questionnaire data (Cox *et al.*, n.d.; Cox *et al.*, 2016).

Conclusions

This study finds, in general, students in the United States during the 21st century were not taught health education by qualified or quality K-12 health education teachers as defined as those who have an academic major or certification in health education. The low levels of healthy literacy among U.S youth reflect this trend indicating staff teaching health education most likely lacked the content knowledge, pedagogical knowledge, and pedagogical content-specific knowledge required of high-quality health teachers. Professional knowledge and pedagogical skills in health education are necessary to provide students with knowledge, attitudes, and skills to adopt and maintain healthful behaviors and reduce risk behaviors. Staffing health classes with out-of-subject

teachers is a lost opportunity as schools are an ideal setting to provide students with opportunities to learn and practice healthy behaviors. Students with fewer risk behaviors experience more academic success and students who are heathier and practice health enhancing behaviors have greater educational achievement (i.e. grades, standardized tests, graduation rates) (CDC, 2014). Therefore, in order to meet the national goals of Healthy People 2020 and Healthy People 2030 to prevent health problems and promote personal health and wellness among youth through comprehensive school health education, it is imperative to hire qualified health education teachers who are either certified in health education or, preferably, have an academic major in health education. The COVID-19 pandemic provides a definitive example of the need for youth to be taught by quality health education teachers so they may develop foundational public health knowledge and skills of disease prevention.

Recommendations for action

Previously, Kahn *et al*. (2007) provided recommendations for increasing the percentage of staff teaching health to be certified in health education teachers and who had an undergraduate or a graduate major in health education. With their findings from SHPPS data (Kahn *et al.*, 2007), National Committee on the Future of School Health Education recommendations for strengthening school health education (Auld *et al.*, 2020), and findings from this study, the recommendation to increase the percentage of health teachers with a health education major continues to be relevant more than ten years later. This paper found a trend for decreasing and a shift in quality and qualification of K-12 health education teachers with no improvements in health literacy or academic achievement, thus providing a foundation for the following recommendations:

1. For principals, administrators, and school boards of education:

   a. hire qualified health education teachers who have both an academic major in health education and certification in health education.

2. For state and federal accountability reporting systems (i.e. school report cards):
   a. include certifications and academic majors of health education teachers.
   b. require an academic major in health education for teacher certification, licensure, or endorsement that includes pedagogical knowledge, health content knowledge, health pedagogical content knowledge.
   c. establish Healthy People 2030 goals to that aim to increase the proportion of schools that require newly hired staff who teach health education to have an undergraduate or a graduate degree (not simply "training") in health education.
3. For state departments of education and institutions of higher education:
   a. establish academic majors in health education to meet the staffing needs of school districts for qualified health education teachers.
4. For professional organizations (i.e. Society for Public Health Education, American School Health Association):
   a. target principals, administrators, and school boards of education to increase awareness that health education and physical education are two distinctly different disciplines with their own K-12 national learning standards, substantial body of content, professional knowledge, and pedagogy.
5. For everyone:
   a. promote the message that health education, when taught by qualified health teachers, provides youth with the knowledge and skills to practice healthy

behaviors and reduce health risk behaviors, which positively affects students' academic perform.

References

(2012), "Report of the 2011 joint committee on health education and promotion terminology", *American Journal of Health Education,* Vol. 42 Sup. 2, pp.1-19. DOI:10.1080/19325037.2012.11008225

Andersson, C., Johansson, P. and Waldenstrom, N. (2011), "Do you want your child to have a certified teacher?", *Economics of Educational Review,* Vol. 30 No. 1, pp.65-78. DOI:10.1016/j.econedurev.2010.07.003

Auld, M.E., Allen, M.P., Hampton, C., Montes, J.H., Sherry, C., Mickalide, A.D., Logan, R., Alvarado-Little, W. and Parson, K. (2020), "Health literacy and health education in schools: collaboration for action", available at: https//doi.org/10.31478/202007b (accessed 27 July 2020).

Banspach S., Zaza, S., Dittus, P., Michael, S., Brindis, C. D. and Thorpe, P. (2016), "CDC grand rounds: adolescence - preparing for lifelong health and wellness", available at: http://dx.doi.org/10.15585/mmwr.mm6530a2 (accessed 10 August 2020).

Baker, D.W., Parker, R.M., Williams, M.V., Clark, W.S., Nurss, J. (1997) "The relationship of patient reading ability to self-reported health and use of health services", Vol. 87 No. 6, pp.1027-1030.

Basch, C.E. (2011), "Healthier students are better learners: a missing link in school reforms to close the achievement gap", *Journal of School Health,* Vol. 81 No. 10, pp.593-598. DOI:10.1111/j.1746-1561.2011.00632.x

Berkman, N.D., Sheridan, D.L., Donahue, K.E., Halpern, D.J., Krotty, K. (2011), "Low health literacy and health outcomes: an updated systematic review", *Annals of Internal Medicine,* Vol. 155 No. 2, pp.97-107.

Birch, D.A., Goekler, S., Auld, M.E., Lohrmann, D.K. and Lyde, A. L. (2019), "Quality assurance in teaching K-12 health education: paving a new path forward", *Health Promotion Practice,* Vol. 20 No. 6, pp.845-857. DOI:10.1177/1524839919868167

Bradley, B.J. and Greene, A.C. (2013), "Do health and education agencies in the United States share responsibility for academic achievement and health? A review of 25 years of evidence about the relationship of adolescents' academic achievement and health behaviors", *Journal of Adolescent Health,* Vol. 2 No. 5, pp.523-532. DOI:10.1016/j.jadohealth.2013.01.008

Bureau of Labor Statistics, U.S. Department of Labor. (2020), "Health educators and community health workers", available at https://www.bls.gov/ooh/community-and-social-service/health-educators.htm (accessed 28 September 2020).

Centers for Disease Control and Prevention. (n.d.), "School health policy and practices study: health education ", available at: https://www.cdc.gov/healthyyouth/data/shpps/pdf/ 2014factsheets/health_education_shpps2014.pdf (accessed 10 October 2020).

Centers for Disease Control and Prevention. (2014), "Health and academic achievement", available at: https://www.cdc.gov/healthyyouth/health_and_academics/pdf/health-academic-achievement.pdf (accessed 27 July 2020).

Centers for Disease Control and Prevention. (2017). "Results from the school health policies and practices study 2016", available at: https://www.cdc.gov/healthyyouth/data/ shpps/pdf/shpps-results_2016.pdf (accessed 10 October 2020).

Centers for Disease Control and Prevention. (2019). "National Health Education Standards", available at: https://www.cdc.gov/healthyschools/sher/standards/index.htm (accessed 10 October 2020).

Centers for Disease Control and Prevention. (2020a), "Whole school, whole community, whole child (WSCC)", available at: https://www.cdc.gov/healthyschools/wscc/index.htm (accessed 27 July 2020).

Centers for Disease Control and Prevention. (2020b). "Health Literacy", available at: https://www.cdc.gov/healthliteracy/education-support/schools.html (accessed 10 October 2020).

Childs, A. and McNicholl, J. (2007), "Investigating the relationship between subject content knowledge and pedological practice through the analysis of classroom discourse", *International Journal of Science Education,* Vol. 29 No. 3, pp.1629-1653. DOI:10.1080/09500690601180817

Clotfelter, C.T., Ladd, H.F. and Vigdor, J.L. (2007), "Teacher credentials and student achievement: longitudinal analysis with student fixed effects", *Economics of Educational Review,* Vol. 26 No. 6, pp.673-682. DOI:10.1016/j.econedurev.2007.10.002.

Cox, C., Gilary, A., Simon, D. and Thomas, T. (n.d.), *Survey Documentation for the 2015–16 National Teacher and Principal Survey,* U.S. Department of Education, Washington, DC.

Cox, S., Parmer, R., Strizek, G. and Thomas, T. (2016), *Documentation for the 2011–12 Schools and Staffing Survey (NCES 2016-817).* U.S. Department of Education, Washington, DC, available at: https://nces.ed.gov/pubs2016/2016817_1.pdf. (accessed 27 July 2020).

Darling-Hammond, L. (2000), "Teacher quality and student achievement: a review of state policy evidence", *Education Policy Analysis Archives,* Vol. 8 No. 1, pp.1-44. DOI:10.14507/epaa.v8n1.2000

Darling-Hammond, L., Holtzman, D.J., Gatlin, S.J. and Heilig, J.V. (2005), "Does teacher preparation matter? Evidence about teacher certification, teach for America, and teacher effectiveness", *Education Policy Analysis Archives,* Vol. 13 No. 42, pp.1-51. ISSN: 1068-2341.

Darling-Hammond, L. (2006), "Constructing 21st-century teacher education", *Journal of Teacher Education,* Vol. 57 No. 3, pp.300-314. DOI:10.1177/0022487105285962

DeWalt, D.A, Hink, A. (2009), "Health literacy and child health outcomes: A systematic review of the literature", *Pediatrics,* Vol 124 S3, pp.S265-S274.

Easton, P., Entwistle, V.A., Williams, B. (2013), "How the stigma of low literacy can impair patient-professional spoken interactions and affect health: insights from a qualitative investigation", *BMC Health Services Research,* Vol. 13 No. 1, pp.319. DOI: 10.1186/1472-6963-13-319

Elfers, A.M., Knapp, M.S. and Pleck, M.L. (2004), "Preparation and support for teaching: a survey of teachers' assignment and certification", available at: https://www.education.uw.edu/ctp/sites/default/files/ctpmail/PDFs/Survey1WorkingPaper.pdf (accessed 10 August 2020).

Feng, L. and Sass, T.R. (2013), "What makes special-education teachers special? Teacher training and achievement of students with disabilities", *Economics of Educational Review,* Vol. 36, pp.122-134. DOI:10.1016/j.econedurev.2013.06.006

Fobbs, E. (2015), "Promoting student achievement through improved health policy", available at: https://www.nasbe.org/promoting-student-achievement-through-improved-health-policy/ (accessed 10 August 2020).

Hill, H.C., Rowan, B. and Ball, D.L. (2005), "Effects of teachers' mathematic knowledge for teaching on student achievement", *American Educational Research Journal,* Vol. 42 No. 2, pp.371-406. DOI:10.3102/00028312042002371

Ingersoll, R. M. (2002). "Out-of-field teaching, educational inequality, and the organization of schools: an exploratory analysis", available at: https://cpre.org/sites/default/files/researchreport/796_outoffield-ri-01-2002.pdf (accessed 10 August 2020)

Kahn, L., Telljohann, S.K. and Wooley, S. (2007), "Health education: results from the school health policies and programs study 2006", *Journal of School Health,* Vol. 77 No. 8, pp.408-434. DOI:10.1111/j.1746-1561.2007.00228.x

Kaplan, R.M., Howard, V.J., Safford, M.M. and Howard, G. (2015), "Educational attainment and longevity: results from the REGARDS U.S. national cohort study of blacks and whites", *Annals of Epidemiology,* Vol. 25 No. 5, pp.323-328. DOI:10.1016/j.annepidem. 2015.01.017

Kutner, M., Greenberg, E., Jin, Y., and Paulsen, C. (2006). "The health literacy of America's adults: results from the 2003 National Assessment of Adult Literacy", available at http://nces.ed.gov/pubs2006/2006483.pdf (accessed 03 Oct 2020).

Lee, J.A., Heberlein, E., Pyle, E., Caughlan, T., Rahaman, D., Sabin, M., Kaar, J. (2020), "Evaluation of a resiliency focused health coaching intervention for middle school students: building resilience for Healthy Kids Program", *American Journal of Health Promotion*, 0890117120959152.

Lloyd, L.L., Ammary, N.J., Epstein, L.G., Johnson, R., Rhee, K. (2006), "A transdisciplinary approach to improve health literacy and reduce disparities", *Health Promotion Practice*, Vol. 7 No. 33, pp.331-335. DOI:10.1186/1471-2458-12-80

National Association of Chronic Disease Directors. (2017), "The whole school, whole community, whole child model: a guide to implementation", available at: https://cdn.ymaws.com/www.chronicdisease.org/resource/resmgr/school_health/NACDD_TheWholeSchool_FINAL.pdf (accessed 10 August 2020).

National Center for Educational Statistics (n.d.), "National teacher and principal survey (NTPS)", available at: https://nces.ed.gov/surveys/ntps/index.asp (accessed 10 August 2020).

Office of Disease Prevention and Health Promotion (2020), "Healthy people 2030", available at https://www.healthypeople.gov/2020/ (accessed 10 October 2020).

Olshansky, S.J., Antonucci, T., Berkman, L., Binstock, R.H., Boersch-Supan, A., Cacioppo, J.T. and Rowe, J. (2012), "Differences in life expectancy due to race and educational differences are widening, and many may not catch up", *Health Affairs,* Vol. 31 No. 8, pp.1803-1813. DOI:10.1377/hlthaff.2011.0746

Sasson, I. (2016)., "Trends in life expectancy and lifespan variation by educational attainment: United States, 1990–2010", *Demography,* Vol. 53 No. 2, pp.269-293. DOI:10.1007/s13524-015-0453-7

School Health

Stronge, J. H. (2018), *Qualities of Effective Teachers* (3rd edition). ASCD, Alexandria, VA.

U.S. Department of Education (n.d.). "Every student succeeds act (ESSA)", available at: https://www.ed.gov/essa?src=rn (accessed 10 August 2020).

U.S. Department of Education. (2015). "*Highly-qualified teacher data: summary of school year 2013-2014 data*", available at: https://www2.ed.gov/programs/teacherqual/hqtreport.pdf (accessed 27 July 2020).

US. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2010). *"National Action Plan to Improve Health Literacy",* available at https://health.gov/sites/default/files/2019-09/Health_Literacy_Action_Plan.pdf (accessed 27 Sep 2020).

Wayne, A.Y.J. and Youngs, P. (2003), "Teacher characteristics and student achievement gains: a review", *Review of Educational Research,* Vol. 73 No. 1, pp.89-122. DOI:10.3102/00346543073001089

Wenglinsky, H. (2002). "How schools matter: the link between teacher classroom practices and student academic performance", *Education Policy Analysis Archives,* Vol. 10 No. 12, pp.1-30. ISSN 1068-2341

Yeh, C. and Santagata, R. (2015), "Preservice teachers' learning to generate evidence-based hypotheses about the impact of mathematics teaching on learning", *Journal of Teacher Education,* Vol. 66 No. 1, pp.21-34. DOI:10.1177/0022487114549470

Table I. Description of study sample by school year

Sample	School Year			
	2003-04	2007-08	2011-12	2015-16
Public schools sample frame (N)	87,760	90,410	90,530	87,600
District sample frame (N)	16,040	14,990	14,550	N/A
Schools sampled (n)	9,440	8,950	10,250	7,100
Teachers sampled (n)	53,190	48,350	51,060	43,700
Weighted response rate (%)	84.8	84.0	77.7	67.9

Table II. Academic major of health education teachers per school year as percent [a] of population

Academic Major (%)	School Year (weighted *n*)			
	2003-04 (58,783)	2007-08 (56,468)	2011-12 (49,902)	2015-16 (49,416)
Health Education	36.6 (32.5-40.9)	38.8 (32.5-45.6)	33.6 (28.3-39.4)	32.2 (27.3-37.5)
Physical Education	29.6 (25.8-33.6)	32.5 (27.2-38.3)	32.7 (27.0-38.8)	35.2 (30.1-40.7)
Other	33.3 (29.5-37.5)	28.0 (23.2-33.4)	28.8 (23.6-34.7)	28.3 (23.7-33.5)
Missing	00.5 (00.3-01.1)	00.7 (00.2-02.4)	04.9 (02.8-08.4)	04.3 (02.7-06.6)
Total	100.0	100.0	100.0	100.0

[a]Design adjusted 95% confidence interval for population estimate boundaries (upper, lower).

Table III. Certification of Health Education (H.E.) Teachers per School Year as Percent [a] of Population

Certification (%)	School Year (weighted *n*)			
	2003-04 (58,783)	2007-08 (56,468)	2011-12 (49,902)	2015-16 (49,416)
Health Education	16.8 (13.0-21.3)	19.2 (14.7-24.6)	14.4 (11.3-18.2)	15.3 (12.3-19.0)
Both H.E. and P.E.	39.5 (34.8-44.3)	40.2 (34.6-46.1)	45.9 (40.6-51.2)	42.9 (38.0-48.0)
Physical Education	11.9 (09.3-15.2)	17.7 (13.3-23.2)	15.5 (10.8-21.6)	16.6 (12.8-21.3)
Other Subjects	30.7 (27.1-34.5)	21.9 (17.4-27.0)	23.3 (18.2-28.6)	24.3 (19.9-29.4)
Missing	01.1 (00.7-01.8)	01.0 (00.4-02.5)	00.9 (00.3-02.5)	00.8 (00.3-02.2)
Total	100.0	100.0	100.0	100.0

[a]Design adjusted 95% confidence interval for population estimate boundaries (upper, lower).