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Results From the Comprehensive Health Educator Core Knowledge and Skills (CHECKS) Professional Development Study

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ABSTRACT

Background: This pilot study examined the effects of the Comprehensive Health Educator Core Knowledge and Skills professional development (CHECKS PD) package on health education (HEd) teacher instructional competencies in one US Pacific Northwest school district.

Methods: During the 2021–2022 academic year, the CHECKS PD package was delivered to secondary school HEd teachers ($n = 32$). Pre/post surveys measured changes in HEd teachers' perceived instructional competencies (i.e., essential knowledge and skills). Wilcoxon signed-rank tests examined changes in teachers' ($n = 15$) perceived instructional competencies before and after participating in CHECKS PD.

Results: Following CHECKS PD participation, teachers perceived their instructional competencies improved in: assess student needs ($Z = -2.26$, $p = 0.02$), child/adolescent development ($Z = -2.02$, $p = 0.04$), communicate effectively and efficiently ($Z = -2.20$, $p = 0.03$), evaluate student performance ($Z = -2.31$, $p = 0.02$), plan instruction ($Z = -2.70$, $p = 0.01$), pedagogical content knowledge ($Z = -2.08$, $p = 0.04$), and professional standards and policies ($Z = -2.56$, $p = 0.01$).

Implications for School Health Policy, Practice, and Equity: Using the skills-focused CHECKS PD package may enhance HEd teachers' instructional competencies.

Conclusion: Future research with larger samples of HEd teachers from geographically diverse settings is needed.

1 | Introduction

Health education plays an integral role in helping youth develop skills and knowledge to practice and maintain healthy behaviors. Teachers' effectiveness in helping students learn and engage in healthy behaviors is influenced by their instructional knowledge, skills, and practices; a relationship well documented in subject areas outside of school health education, such as mathematics and English [1]. Meta-analytic evidence suggests teacher pedagogical content knowledge in mathematics and English is associated with improvements in student achievement [1], and that teacher professional development (PD) in mathematics has a significant impact on student achievement [2]. Specific to health education, research examining how teacher characteristics

contribute to increased student knowledge and skill development is scant but growing. Individual and classroom-related characteristics, such as teacher certification status, dedicated classroom space, and PD attendance, have been associated with greater health-related knowledge gains among students [3]. A recent study found when adolescents perceived their health education teachers valued sexual health content, for example, they were more likely to report increased self-efficacy regarding sexual health [4].

Recognizing the potential role health education teachers can play helping students practice health-enhancing skills and developing knowledge, it is essential to identify and enhance teacher instructional knowledge, skills, and practices. For instance, studies document the effectiveness of PD on health-related instruction and on improving teachers' self-efficacy in providing health education [5–7]. PD is an important mechanism for improving health educator practices and, consequently, increasing the likelihood of students acquiring the knowledge and skills for practice and maintaining healthy behaviors [8]. However, nationwide data from the Centers for Disease Control and Prevention's (CDC) 2022 School Health Profiles point to misalignment in the types of PD that secondary health education teachers request and what school districts provide — particularly for core instructional functions like assessing student performance (requested by 61.4% of secondary health education teachers and provided by 36.8% of school districts), teaching skills for behavior change (requested by 68.6% of secondary health education teachers and provided by 51.2% of school districts), and using interactive teaching methods (requested by 58.7% of secondary health education teachers and provided by 54.8% of school districts) [9].

In response to such misalignment, the CDC developed the Health Education Teacher Instructional Competency (HETIC) framework, "a conceptual roadmap to guide quality health education preparation, job-embedded training, and delivery" in 2021 [8, p. 2]. The framework defines health education instructional competencies as "the personal characteristics, professional knowledge, and skills that through practical application contribute to quality instruction that influences student academic and health behavior outcomes" [8, p. 3]. The HETIC framework also emphasizes creating inclusive and affirming learning environments for students in health education by identifying skill-based performance indicators conceptualized to support equity in health education, such as teacher skills related to incorporating diverse perspectives using culturally responsive teaching practices [8]. Using the HETIC framework's knowledge ($n = 5$) and skill ($n = 11$) domains and performance indicators, school health professionals can identify and assess their competencies.

To date, no studies have applied the HETIC framework to develop school health education teacher PD or investigated its effects on teachers' perceived instructional competencies [8]. This study used the HETIC framework to create the Comprehensive Health Educator Core Knowledge and Skills (CHECKS) PD package for secondary school health education teachers. The skills-focused PD aimed to help teachers develop and strengthen their health education instructional competencies. The PD addressed the five essential knowledge subdomains and eleven essential skills subdomains of the HETIC framework [8] (see Supporting Information File A for domains, subdomains, and sample performance indicators from CDC's HETIC). Authors hypothesize that strengthening teachers' instructional competencies can enhance their teaching practices, which in turn may contribute to improved student development of health knowledge and skills needed for health behaviors [8]. This study assessed associations between teachers' participation in the CHECKS PD package and changes in perceptions of their instructional competencies over the 2021–2022 academic year. Further, authors wanted to assess if changes in perceived knowledge were correlated with changes in perceived skills. Findings contribute the first evidence on the role of skills-focused PD in supporting teachers' perceptions of their instructional competencies in school health education.

2 | Methods

2.1 | Participants

From April to May 2020, authors conducted virtual evaluability assessments [10] to assess capacity and readiness to pilot the CHECKS PD package with three CDC-funded school districts implementing school-based strategies to reduce or prevent STI/HIV and pregnancy among adolescents [11]. The assessments included discussions with district and school-level staff regarding health education programming, teacher instructional needs, and district-supported PD infrastructure and activities. Authors reviewed information collected during the assessments (e.g., health education PD policies, instructional time requirements, curriculum materials) to determine readiness, capacity, and feasibility of implementing the CHECKS PD package in each school district. One school district in the US Pacific Northwest was selected for participation in the CHECKS PD pilot based on available staff capacity and budget to support the project.

2.1.1 | CHECKS PD Package

The CHECKS PD package was developed by the authors with guidance from subject-matter experts in school health education. The topics and content of the CHECKS PD package were grounded in CDC's HETIC framework and included content related to performance indicators across the knowledge ($n = 22$ performance indicators) and skills ($n = 106$ performance indicators) domains. While some content may serve as a refresher for experienced health education teachers, other CHECKS PD package components introduced new or more complex instructional competencies that were reinforced across multiple delivery formats (e.g., in-person, virtual models, peer sharing). The package's blended learning model included 16 hours of instruction delivered through one six-hour in-person skills-based training session, eight self-paced virtual modules, and four peer sharing network (PSN) sessions. Additional details are described in ***Supporting Information Files B and C.

2.2 | Instrumentation

2.2.1 | Data Collection Instruments

Guided by CDC's HETIC framework [8], teacher data collection instruments included:

- *Pre/post survey*: Authors developed a 131-item, online, self-administered questionnaire to assess teachers' perceived instructional competencies before and after participating in CHECKS PD package. Survey items were initially derived from the performance indicators in the HETIC framework and supplemented with additional items identified through a comprehensive review of existing teacher surveys [8]. These items were then refined through an iterative process including cognitive interviews with health education teachers and feedback from subject matter experts. Feedback informed item revisions to ensure clarity and alignment with intended HETIC framework constructs. The final teacher survey included $n = 20$ items regarding perceived essential knowledge and $n = 99$ items about perceived essential skill performance indicators. Survey response options included distinguished, proficient, basic, not proficient, and not applicable. "Not applicable" responses were treated as missing values during analysis to avoid skewing results. For personal characteristics, the third domain of the HETIC framework, the survey included items measuring teacher qualifications and experience. Measures of teacher qualification included health education degree; license, certification, or endorsement in health education; and certification pathway (i.e., traditional: completed a formal, university/college teaching preparation program with a major or minor in health education; and nontraditional: completed a specialized, accelerated program such as Teach for America). Measures of teaching experience included years of health education teaching experience and grade level taught. Level of educational attainment was also measured. The survey was administered via Survey Monkey at two time points: prior to beginning the CHECKS PD package (pre-survey; May–September 2021) and after its completion (post-survey; April–May 2022). Both versions were identical to allow for direct comparison of self-reported instructional competencies over time.
- *CHECKS PD dosage*: For the study, dosage was conceptualized as the number of CHECKS PD package components completed, not the total number of hours by the participating teacher. Registration sign-in sheets were used to record health education teacher attendance in the CHECKS PD 6-hour in-person skills training. Administrative information from the CHECKS PD learning management system (LMS), including registration; access dates and duration on LMS; and module completion dates were tracked for all eight virtual modules. Additionally, an implementation tracking log recorded participant sign-in for each PSN session. To calculate dosage for analysis, data were dichotomized by the median number of CHECKS PD package components completed by teachers. There were a total of 13 components within the CHECKS PD package (1 in-person training, 8 virtual modules, and 4 PSNs) and the median number of components completed was eight. Those at or below the median (1–8 modules completed) were labeled "low dosage," above the median (9–13 modules completed) were labeled "high dosage."

2.3 | Procedure

To support CHECKS PD recruitment and implementation, a school district Teacher on Special Assignment (TOSA) provided substantial and ongoing support during the study. The TOSA was a certified health education teacher who provided district-wide support for health education curriculum development and teacher PD. The TOSA helped recruit teachers, coordinated and led PSN sessions, and conducted administrative tasks (e.g., email communications).

As part of recruitment, eligible full-time secondary school health education teachers received an email describing the CHECKS PD pilot study, expectations for participation, and an electronic consent form. Once consent was received, teachers received a thank-you email detailing timelines for study activities, data collection, and a link to the teacher pre-survey. Following completion of the pre-survey, teachers received links for two modules in the CHECKS PD package (*Basic Principles of Teaching Health Education* and *Culturally Responsive Teaching Practices*) assigned as prework to be completed before the in-person, skills-based training (August and September 2021). Teachers were provided hourly financial compensation for participating in the study in accordance with the district's PD policy on teacher reimbursement.

2.4 | Data Analysis

Changes in teachers' perceived instructional competencies from the pre/post survey were assessed using descriptive analysis and Wilcoxon signed-rank tests. Authors used the Wilcoxon signed-rank test to assess changes in paired pre/post survey responses, as it is a nonparametric alternative to the paired t test and does not assume normally distributed differences. Spearman rho tests explored correlations between changes in teachers' essential knowledge and essential skills before and after participation in CHECKS PD. Spearman's rho was used to evaluate correlations given its suitability for small sample sizes and non-normally distributed survey data.

Mann–Whitney U tests analyzed differences in the change scores from teachers with pre-/post-survey data ($n = 15$) by CHECKS PD dosage, teacher characteristics, and teacher qualifications. All differences were considered statistically significant if the p value was < 0.05. All analyses were performed using IBM SPSS Statistics version 22.

3 | Results

Thirty-two secondary school health education teachers completed the CHECKS PD pilot study pre-survey (Table 1). The majority were White (87.4%), followed by Hispanic (9.4%), preferred not to answer (9.4%), American Indian or Alaskan Native (3.1%), Asian (3.1%), and Black or African American (3.1%).

TABLE 1 | Demographic and select teacher experience and qualification characteristics from teachers who completed the pre- and post-survey of health education teacher instructional competencies.

	Pre-survey[a]		Post-survey[a]	
	N	**%**	***N***	**%**
Total	32	100.0	15	100.0
Race[b]				
American Indian or Alaskan Native	1	3.1	0	0.0
Asian	1	3.1	0	0.0
Black or African American	1	3.1	0	0.0
Native Hawaiian or Other Pacific Islander	0	0.0	0	0.0
Prefer not to answer	3	9.4	1	6.7
White	28	87.5	14	93.3
Hispanic/Latino/a				
Yes	3	9.4	1	6.7
No	29	90.6	14	93.3
Educational attainment				
Bachelor's degree	5	15.6	2	13.3
Master's degree	26	81.3	12	80.0
Doctorate/professional	1	3.1	1	6.7
Teaching experience, years				
1	6	18.8	3	20.0
2–5	14	43.8	5	33.3
6–9	4	12.5	2	13.3
10–14	3	9.4	1	6.7
15 or more	5	15.6	4	26.7
Grades taught				
6–8	18	56.3	10	66.7
9–12	14	43.8	5	33.3
Health education degree				
Yes	13	40.6	7	46.7
No	19	59.4	8	53.3
License, certification, or endorsement in health education				
Yes	25	78.1	12	80.0
No	7	21.9	3	20.0
Certification pathway[c]				
Alternative[d]	2	6.3	1	8.3
Traditional	17	53.1	8	66.7
Other	6	18.8	3	25.0

Note: N = unweighted.

[a]The pre-survey was administered between May and September 2021, and the post-survey was administered between April and May 2022.

[b]Participants could select multiple categories for race; therefore, the total could exceed 100%.

[c]Missing responses on post-survey ($n = 3$ participants).

[d]Health education certification pathway is defined as: alternative = completion of a specialized, accelerated program (e.g., teach for America, others); traditional = completion of a formal, university/college teaching preparation program with a major or minor in health education; other = completion of another pathway not specified.

While 81.3% held a master's degree, only 40.6% had a degree in health education. A majority (78.1%) were licensed, certified, or endorsed to teach health education, and 53.1% followed a traditional certification pathway. More middle school teachers participated than high school teachers (56.3% and 43.8%, respectively), and 43.8% had 2–5 years of teaching experience at the time of the survey. Of the 32 initial CHECKS PD teachers, 15 completed the post-survey (46.9%). Although most teachers did not complete the post-survey, the distribution of demographic and teacher characteristics between pre- and post-surveys was similar (Table 1).

3.1 | Change in Teachers' Perceived Essential Knowledge and Skills

Teachers' average ratings increased for each perceived essential knowledge and skill sub-domain (Table 2), with significant results in seven sub-domains. Specifically, rating scores increased significantly in three essential knowledge sub-domains: child/adolescent development ($Z = -2.02$, $p = 0.04$), pedagogical content knowledge ($Z = -2.08$, $p = 0.04$), professional standards and policies ($Z = -2.56$, $p = 0.01$); and four essential skill sub-domains: assess student needs ($Z = -2.26$, $p = 0.02$), communicate effectively and efficiently ($Z = -2.20$, $p = 0.03$), evaluate student performance ($Z = -2.31$, $p = 0.02$), and plan instruction ($Z = -2.70$, $p = 0.01$).

3.2 | Correlation Between Changes in Teachers' Perceived Essential Skills by Essential Knowledge

Significant relationships between changes in ratings of perceived essential knowledge sub-domains by essential skills sub-domains were observed for all but two skills (implement instruction and engage stakeholders and priority populations) (Table 3). Specifically, increased perceived knowledge ratings about child/adolescent development were significantly positively correlated with changes in ratings on assessing student needs, planning instruction, and giving and receiving feedback ($\rho = 0.54$, $p = 0.04$; $\rho = 0.53$, $p = 0.04$; and $\rho = 0.59$, $p = 0.02$, respectively). Perceived increased knowledge ratings about learner/community characteristics were positively correlated with changes in assessing student needs, planning instruction, and giving and receiving feedback ($\rho = 0.66$, $p = 0.01$; $\rho = 0.66$, $p = 0.01$; and $\rho = 0.82$, $p = 0.00$, respectively). Perceived increased ratings in the sub-domain subject content knowledge were positively correlated with changes in planning instruction, evaluating student performance, reflecting on teaching practice, communicating effectively and efficiently, giving and receiving feedback, and participating in ongoing professional learning ($\rho = 0.56$, $p = 0.03$; $\rho = 0.61$, $p = 0.02$; $\rho = 0.75$, $p = 0.00$; $\rho = 0.68$, $p = 0.01$; $\rho = 0.76$, $p = 0.00$; and $\rho = 0.59$, $p = 0.02$, respectively). Increased ratings in the sub-domain pedagogical content knowledge were positively correlated with changes in creating safe, inclusive spaces, managing student behavior, and evaluating student performance ($\rho = 0.68$, $p = 0.01$; $\rho = 0.86$, $p = 0.00$; and $\rho = 0.57$, $p = 0.03$, respectively). Finally, perceived increased knowledge ratings of professional standards and policies were positively

TABLE 2 | Change scores for teacher pre- and post-survey ratings on health education teacher instructional competencies (HETIC) essential knowledge and skills ($n = 15$).

HETIC domains	Pre-survey	Post-survey	Diff	*Z*	*p*
Essential knowledge					
Child/adolescent development	2.80	3.04	0.24	−2.02	**0.04***
Learner/community characteristics	3.16	3.21	0.05	−0.68	0.50
Subject content knowledge	2.78	3.08	0.31	−1.65	0.10
Pedagogical content knowledge	2.60	2.96	0.36	−2.09	**0.04***
Professional standards and policies	2.52	3.00	0.48	−2.56	**0.01***
Essential skills					
Create safe and inclusive spaces	3.38	3.48	0.10	−1.42	0.16
Managing student behaviors	3.17	3.27	0.10	−1.16	0.25
Assess student needs	2.65	2.99	0.34	−2.27	**0.02***
Plan instruction	2.74	3.07	0.33	−2.71	**0.01***
Implement instruction	3.30	3.34	0.04	−0.06	0.96
Evaluate student performance	2.80	3.10	0.30	−2.31	**0.02***
Reflect on teaching practice	2.81	3.03	0.22	−1.74	0.08
Communicate effectively and efficiently	3.16	3.40	0.24	−2.21	**0.03***
Engage stakeholders and priority populations	2.83	2.86	0.03	0.00	1.00
Give and receive feedback	3.22	3.23	0.02	−0.11	0.91
Participate in on-going professional learning	2.95	3.08	0.12	−0.67	0.50

Abbreviation: Diff = difference.
*Bold indicates statistically significant at the 0.05 level.

correlated with changes in assessing student needs and planning instruction ($\rho = 0.67$, $p = 0.01$ and $\rho = 0.59$, $p = 0.02$, respectively).

3.3 | Change in Teachers' Perceived Essential Knowledge and Skills by CHECKS PD Dosage and Teacher Experience/Qualification Characteristics

Results from the Mann–Whitney *U* tests revealed that teachers who were not licensed, certified, or endorsed in health education reported significant increases in perceived skill sub-domains between pre- and post-survey relative to those with credentials. The sub-domains included: participate in on-going professional learning ($Z = -2.48$, $p = 0.01$) and plan instruction ($Z = -2.32$, $p = 0.02$) (Table 4).

No statistically significant differences were found in changes to teachers' perceived essential knowledge and skill sub-domains ($n = 16$) by CHECKS PD dosage (data not shown); years of experience teaching health education or grade level taught (Supporting Information File D); health education degree and type of degree (Supporting Information File E). Although not statistically significant, favorable patterns were seen for increased changes to perceived essential knowledge and essential skills ratings between pre- and post-survey. More positive changes were observed for teachers who received a higher dosage of the CHECKS PD package ($n = 7$) compared with those who received lower dosage ($n = 8$) on 13 of the 16 essential knowledge and essential skill sub-domain ratings; participants without a health degree ($n = 8$) compared with those with a health degree ($n = 7$) on 14 out of 16 sub-domain ratings; and participants reporting an alternative pathway to certification ($n = 4$) compared to those with traditionally obtained certifications ($n = 8$) on 10 of the 16 essential knowledge and essential skill sub-domain ratings.

4 | Discussion

Findings suggest an overall increase in teachers' self-reported perceptions of their instructional competencies aligned with the HETIC framework after participating in CHECKS PD. Significant improvements in three of the five essential knowledge sub-domains and four of the 11 essential skills sub-domains were observed. Taken together, results align with prior studies demonstrating that PD effectively enhances teacher knowledge and skills [12–15]. Although not all reached statistical significance, this study highlights favorable patterns in changes to perceived instructional competencies after participating in CHECKS PD among teacher sub-groups, including those with fewer years of teaching experience; without health education licenses, certifications, or endorsements; and who pursued alternative pathways to certification. These findings lend support to existing studies in other academic disciplines showing alternatively certified teachers may need additional training and supports [16, 17] and PD may be particularly beneficial for new teachers [18].

Increases in self-reported perceptions of pedagogical content knowledge and subject-content knowledge after CHECKS PD participation were significantly correlated with increased perceptions in eight essential skills sub-domains. In alignment with other studies [15, 18], building health education teachers' pedagogy and subject-content knowledge is important to support instruction and may enhance student learning. Positive correlations between teachers' perceived improvement in knowledge about Child/Adolescent Development and multiple essential skills sub-domains (e.g., assessing student needs and planning instruction) are important as child/adolescent development is often underrepresented in teacher preparation and in-service training [19]. These positive correlations also align with evidence showing PD that integrates skill-based learning may help teachers' instructional practices [20].

Future studies are needed to replicate and expand our findings. Recruiting and retaining larger samples of health education teachers and students from diverse school districts is needed to study CHECKS PD participation, changes in teachers' instructional competencies, and students' perceptions of teacher essential skills. Greater emphasis on sub-group differences (i.e., teacher demographics and characteristics) and differential

TABLE 3 | Correlations between difference in teacher pre- and post-survey ratings on health education teacher instructional competencies (HETIC) essential skills by essential knowledge ($n = 15$).

	Essential knowledge				
Essential skills	**Child/ adolescent development**	**Learner/ community characteristics**	**Subject content knowledge**	**Pedagogical content knowledge**	**Professional standards and policies**
Create safe and inclusive spaces	0.44	0.29	0.45	0.68**	0.13
Managing student behaviors	0.33	0.27	0.20	0.86**	0.30
Assess student needs	0.54*	0.66**	0.50	0.34	0.67**
Plan instruction	0.53*	0.66**	0.56*	0.39	0.59*
Implement instruction	0.51	0.44	0.46	0.37	0.42
Evaluate student performance	−0.00	0.44	0.61*	0.57*	0.49
Reflect on teaching practice	0.36	0.23	0.75**	0.36	0.25
Communicate effectively and efficiently	0.09	0.26	0.68**	0.60*	0.21
Engage stakeholders and priority populations	−0.16	0.06	0.46	0.37	0.09
Give and receive feedback	0.59*	0.82**	0.76**	0.38	0.21
Participate in on-going professional learning	0.12	0.37	0.59*	0.27	0.32

*Correlation is significant at the 0.05 level (two-tailed).
**Correlation is significant at the 0.01 level (two-tailed).

dose of the CHECKS PD package components (i.e., the number and type of CHECKS PD package components completed) is needed.

4.1 | Implications for School Health Policy, Practice, and Equity

This study is the first to operationalize and use the CDC's HETIC framework for health education teacher PD. The positive changes in teachers' perceived instructional competencies following participation in CHECKS PD may inform school and district PD offerings. Specifically, incorporating elements such as skills-based training, self-paced virtual modules, and peer-to-peer learning may strengthen PD. Additional evidence from this study underscores the value of strengthening pedagogical and subject content instructional competencies, known to be critical for effective PD [13, 15–21]. For school districts establishing or enhancing health education PD, careful consideration can be given to available resources, staff capacity, and policies and procedures necessary to support intensive and sustained implementation. The participating school district in this study had an existing, robust PD infrastructure (e.g., annual PD time; tracking and accountability for regular PD refreshers; financial support for teachers attending PD; and a responsive team available to provide technical assistance as needed to teachers and schools) that helped support the implementation of the CHECKS PD pilot study throughout the school year.

4.2 | Limitations

This pilot study has several limitations. The COVID-19 pandemic presented significant challenges to study recruitment and contributed to participant attrition between the pre- and post-surveys, which limited the ability to assess changes over time and reduced the overall analytic sample. These data from one school district in the US Pacific Northwest are not necessarily generalizable to other school settings, teachers, or health education PD offerings. Small samples limited the ability to validate data collection instruments (e.g., teacher pre/post survey) or analyze the full effects of the CHECKS PD package on health education teacher perceived instructional competencies. Given the study's small *N*, any significant findings presented are likely conservative estimates of the teacher-level outcomes associated with CHECKS PD participation. These pilot results suggest weighting for certain CHECKS PD package components (e.g., in-person training vs. self-paced virtual modules) would be beneficial for future dosage analysis. Authors did not apply apriori decisions about CHECKS PD package components to explore dosage, given the absence of theoretical justification. More rigorous replication with larger samples is also important to determine which CHECKS PD package components to emphasize (and to achieve efficiencies in PD in resource-constrained districts) in the future.

5 | Conclusion

The CHECKS PD pilot study showed promise in improving secondary school health education teachers' perceptions of their instructional competencies in one large, urban school district from 2021 to 2022. Results show increases in teachers' perceived knowledge were associated with improvements in their perceptions of their own essential skills. Future research with larger sample sizes of teachers from geographically diverse school districts is needed to expand study findings.

TABLE 4 | Change scores for teacher pre- and post-survey by teacher qualification characteristics: License, certification, or endorsement in health education; and traditional certification.

	License, certification, or endorsement in health education							Traditional certification[a]						
	No ($N = 3$)			Yes ($N = 12$)				No ($N = 4$)			Yes ($N = 8$)			
	Change score			change score				Change score			Change score			
HETIC domains	**Pre**	**Post**	**Diff**	**Pre**	**Post**	**Diff**	***Z***	**Pre**	**Post**	**Diff**	**Pre**	**Post**	**Diff**	***Z***
Essential knowledge														
Child/adolescent development	2.89	3.44	0.56	2.78	2.94	0.17	−1.74[b]	2.75	2.83	0.08	2.79	3.00	0.21	−0.71[b]
Learner/community characteristics	3.33	3.60	0.27	3.12	3.12	0.00	−1.18[b]	2.95	2.95	0.00	3.20	3.20	0.00	0.00[b]
Subject content knowledge	2.36	3.17	0.81	2.88	3.06	0.18	−1.39[b]	2.50	3.13	0.63	3.07	3.03	−0.04	−1.80[b]
Pedagogical content knowledge	2.33	3.44	1.11	2.67	2.83	0.17	−2.02[b]	2.67	2.83	0.17	2.67	2.83	0.17	−0.36[b]
Professional standards and policies	2.20	3.40	1.20	2.60	2.90	0.30	−1.68[b]	2.35	2.80	0.45	2.73	2.95	0.23	−0.43[b]
Essential skills														
Create safe and inclusive spaces	3.36	3.67	0.31	3.38	3.43	0.05	−1.53[b]	3.28	3.30	0.02	3.43	3.50	0.06	−0.51[b]
Managing student behaviors	3.20	3.63	0.43	3.17	3.18	0.02	−1.18[b]	3.23	3.08	−0.15	3.14	3.24	0.10	−1.02[b]
Assess student needs	2.15	3.12	0.97	2.78	2.96	0.18	−2.03[b]	2.70	2.89	0.18	2.82	3.00	0.18	−0.09[b]
Plan instruction	2.30	3.21	0.91	2.85	3.04	0.19	−2.32[b]*	2.86	3.16	0.30	2.84	2.98	0.13	−0.77[b]
Implement instruction	3.03	3.44	0.41	3.37	3.31	−0.06	−1.81[b]	3.12	3.16	0.03	3.49	3.38	−0.10	−1.93[b]
Evaluate student performance	2.67	3.17	0.50	2.83	3.08	0.25	−0.93[b]	2.88	3.25	0.38	2.81	3.00	0.19	−1.17[b]
Reflect on teaching practice	2.44	3.06	0.61	2.90	3.03	0.13	−1.68[b]	2.83	3.17	0.33	2.94	2.96	0.02	−1.03[b]
Communicate effectively and efficiently	3.11	3.56	0.44	3.17	3.36	0.19	−0.92[b]	2.92	3.17	0.25	3.29	3.46	0.17	−0.46[b]
Engage stakeholders and priority populations	2.80	3.27	0.47	2.83	2.76	−0.08	−1.31[b]	2.30	2.73	0.43	3.10	2.78	−0.33	−1.37[b]
Give and receive feedback	2.92	3.33	0.42	3.29	3.21	−0.08	−1.87[b]	3.13	3.13	0.00	3.38	3.25	−0.13	−0.45[b]
Participate in on-going professional learning	2.33	3.29	0.95	3.11	3.02	−0.08	−2.47[b]**	2.86	3.07	0.21	3.23	3.00	−0.23	−1.98[b]

Abbreviations: CHECKS = comprehensive health educator core knowledge and skills, Diff = difference, HETIC = health education teacher instructional competencies, PD = professional development.

[a]Health education certification pathway is defined as: alternative = completion of a specialized, accelerated program (e.g., teach for America, others); traditional = completion of a formal, university/college teaching preparation program with a major or minor in health education; other = completion of another pathway not specified.

[b]Not corrected for ties.

*Statistically significant at the 0.05 level.

**Statistically significant at the 0.01 level.

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Disclosure

The findings and conclusions of this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Ethics Statement

The study protocol and materials were reviewed and approved by the ICF Institutional Review Board for the Protection of Human Subjects (ICF IRB FWA00002349) and the participating school district's System Planning and Performance Department (#2020-21-016).

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Data S1:** josh70101-sup-0001-Supinfo.docx.