

RESEARCH ARTICLE

Beyond Co-Location: Development of a School Health Integration Measure

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ABSTRACT

BACKGROUND: School-based health centers (SBHCs) can integrate health and educational services to achieve common goals of student wellness and success. As no method exists to quantify the degree of integration for clinics and partner schools, this study aimed to design such a measure.

METHODS: Measure items were drafted from the literature. Eleven school health experts from Los Angeles, CA, used a modified Delphi method to reach consensus around items for inclusion in a School Health Integration Measure (SHIM), evaluating each on its appropriateness, substantivity, and feasibility. Twenty-eight staff at 17 SBHC campuses pilot tested the SHIM to examine its psychometric properties.

RESULTS: From 36 items, the expert panel utilized 4 rounds to reach consensus on 12 items across 5 domains: health authority, integrated programming, marketing and recruitment, shared outcomes, and staff collaboration. In the SHIM pilot, scores ranged from 2.25 to 5 (possible 1-5, mean 3.53). The measure had high internal consistency ($\alpha = 0.9385$) and was associated with participants' general assessment of integration at their sites ($p = .001$).

CONCLUSIONS: The SHIM provides a new tool to quantify health and educational service integration at SBHC sites, drive practice improvement, and test whether integration leads to better student outcomes.

Keywords: school-based clinics; child and adolescent health; community health; organization and administration of school health programs; school health services.

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School-based health centers (SBHCs) are increasingly recognized as an effective pediatric and adolescent health care delivery model,^{1,2} particularly for BIPOC and low-income youth.³⁻⁵ Much of the success of SBHCs is in increasing health care access by physically bringing services to where students are, breaking down barriers that may be posed by distance.⁶⁻⁸

Beyond geographic co-location, however, many school-based health proponents argue that the ultimate goal for SBHCs is to provide health care and services that are meaningfully different from that delivered at a traditional clinic.⁹ By integrating health services with educational services, SBHCs can work synergistically with schools to achieve a common

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goal of student well-being and success. Given the overlap of social determinants that influence both health and educational outcomes for youth,¹⁰⁻¹² such integration may be particularly effective at improving outcomes for disadvantaged populations. This idea of integrated operations between the school and clinic is widely embraced, directly in line with the Whole School, Whole Community, Whole Child approach adopted by the U.S. Centers for Disease Control and Prevention.¹³ A number of groups have described best-practice standards and a vision for what a fully integrated SBHC might look like.^{14,15} These integration guidelines call for an aligned focus for the school and health center on shared outcomes, such as attendance, behavior, and academic performance; joint creation of policies, procedures, and structures to support student wellness and academic success; and coordination to ensure available services are known, accessible, appropriate, and responsive to students and families. Despite this promise and attention, there are no existing SBHC integration measures.

Much work has been dedicated to conceptualizing integrated care^{16,17} and developing related measurement instruments,^{18,19} but this work largely focuses on integration within the health sector and is often centered around continuity of care for chronic health conditions. With regards to cross-sector integration, the introduction of behavioral health services into primary care settings provides direct insight into the development of a validated tool by which to measure the degree of integration of services.²⁰⁻²³ In addition, documentation of efforts to bring mental health services into schools describes important insights into integration across the education and health sectors.²⁴⁻²⁶

For SBHCs specifically, however, beyond an aspirational idea, it is unclear how to operationalize the concept of integration for both clinics and their partner schools. In addition, without SBHC integration measures, it is impossible to quantify the impact integration might have on overall SBHC performance and identify aspects of integration most important to achieving better health and educational outcomes for youth.

To address the gap, we sought to develop and pilot test a School Health Integration Measure (SHIM) in partnership with school health stakeholders in Los Angeles, California. First, we drew upon the existing literature to define the concept of SBHC integration. We then utilized a modified Delphi method²⁷ to develop consensus metrics for SBHC integration among local school health experts. Finally, we surveyed staff at SBHC campuses around Los Angeles to pilot test the final measure and examine its psychometric properties.

METHODS

Phase 1: Design of the School Health Integration Measure

Participants. We partnered with the Los Angeles Unified School District (LAUSD) and the Los Angeles Trust for Children's Health (The L.A. Trust), an independent nonprofit organization created by the LAUSD Board of Education to improve student health and increase readiness to learn through health care access, advocacy, and programs.²⁸ With LAUSD and The L.A. Trust, we identified a panel of school health experts from across Los Angeles to review the literature and participate in a modified Delphi process to establish consensus around the metrics to be included in the SHIM. Potential panelists were nominated to represent a wide variety of school health perspectives. They were invited via email to participate in two in-person meetings and iterative rounds of scoring and email discussion until consensus was achieved. If the invitee was unable to participate, they were encouraged to identify a designee that could represent their perspective.

Instruments. The initial pool of domains and standards for the SHIM was generated by the study team, drawing from multiple existing sources. Literature on developing a measure for the integration of behavioral health services into primary care settings²⁰⁻²² served as a framework for domains that could be included. Best practice standards and aspirational visions for a fully integrated SBHC from leading state and national organizations in the field of school health^{14,15} provided specific examples of metrics that could be incorporated. Finally, internal efforts by the L.A. Trust to promote collaboration between SBHCs and partner schools provided additional source material. From these sources, we developed a draft pool of 36 items across five domains: health authority, integrated programming, marketing and recruitment, shared outcomes, and staff collaboration (see Appendix 1, Table A1).

The overarching aim of this first phase was the development of a practical tool that was both evaluative and aspirational. We aimed for an evaluative tool in the sense that it would provide SBHC sites with an accurate measurement of the degree to which their health and educational services are integrated at the time of assessment. We also sought to develop an aspirational tool that would provide SBHCs with concrete strategies to increase or improve their integration of services. Consequently, we asked participants to evaluate whether each of the 36 proposed items was appropriate (ie, does this item capture the notion of integration?), substantive (ie, would this item lead to improved health and/or academic outcomes for youth?), and feasible (ie, is this a reasonable expectation of a "highly integrated"

SBHC?). Panelists assessed each criterion for all items in each round with a 1 to 9 rating, 1 indicating “not at all” and 9 indicating “perfectly,” a scoring system aligned with the modified Delphi process described below.²⁷ We shared with panelists that we envisioned a final tool consisting of 1 to 3 metrics across 5 domains, or 10 to 15 items in total, in order to achieve a tool that would be both comprehensive and feasible for SBHCs to complete.

Procedure. We utilized a modified Delphi process, a structured procedure whereby a series of “rounds” is used to gather information and provide feedback among a panel in an iterative fashion until consensus is reached.^{27,29} The “modified” process includes a physical meeting with participants, whereas the standard Delphi model involves only remote participation. Given that this was, to our knowledge, the first attempt at creating such a tool, we selected the modified Delphi method as an optimal means to structure open discussion among a diverse group of experts with the ultimate aim of narrowing the panel’s discourse to consensus around a final set of items.

The panel of school health experts was convened. An introductory meeting was held to review existing literature on school health integration, examine measures assessing health integration from other fields, describe the modified Delphi process that would be utilized, set norms for collaboration, and respond to any questions from participants. Panel members next completed an online survey to independently rate each of the initially 36 proposed items on the 3 criteria of appropriateness, substantivity, and feasibility. Participants were invited to edit or comment on each item and propose new items or domains for inclusion. Following the first round, panelists were provided a summary of results on all 3 criteria for each of the 36 items along with general comments collected. A second in-person meeting was held to discuss these results and engage the panelists in conversation around all items that did not achieve consensus for either inclusion or exclusion as discussed below. The second round of scoring was then conducted electronically on all items for which the group had yet to reach consensus, and results from that round were shared electronically. This process was repeated until consensus was reached on all items or the group decided that no further discussion was warranted. The final document was then distributed to each member of the panel with a final opportunity for feedback.

Data analysis. Analysis was conducted for each round of scoring in the modified Delphi process. For all 3 criteria (ie, appropriate, substantive, feasible), the highest and lowest ratings of each item were eliminated as outliers and then means and standard deviations were calculated. Consensus for adoption was defined as a mean of 7 to 9 for an item across all 3 criteria (possible range of 1 to 9 for each criterion),

whereas consensus on item elimination was defined as a mean of 1 to 3 across all 3 criteria. All items not adopted nor eliminated were included in the next round of scoring and analysis. Statistical analyses were conducted using STATA version 15 (StataCorp LP, College Station, TX).

Phase 2: Pilot Testing of the SHIM

Participants. We pilot tested the SHIM with SBHCs across LAUSD public school campuses. The L.A. Trust and LAUSD’s Student Health and Human Services identified sites and participants to be contacted. Sites were selected to represent a range of SBHCs both in terms of suspected levels of integration with their colocated school (ie, from sites perceived to be highly integrated to sites where integration was minimal), as well as overall functioning (as suggested by indicators such as patient volume and performance on clinical quality metrics). The SBHCs chosen included Wellness Centers, clinics created by LAUSD and the L.A. Trust in conjunction with local federally qualified health centers (FQHCs) that provide a full range of services to both students and the general community, along with more traditional LAUSD SBHCs that provide services exclusively to students. We aimed to recruit at least 2 participants from each of 18 sites, one employed by the SBHC and the other employed by the school, to capture a comprehensive perspective of integration. The survey was described at an in-person meeting where participants had an opportunity to ask questions. A recruitment email was then sent to potential participants including a link to complete the anonymous survey. Participants were invited to enter into a raffle for a \$100 gift card regardless of their decision to participate in the study.

Instruments and procedure. To establish a baseline understanding of “integration,” the computerized survey first introduced the concept as “a SBHC and school making specific efforts to collaboratively work toward common goals of student wellness and success.” To gauge participants’ sense of integration at their sites based only on this generalized conception, it then asked participants to rate, from 1 to 10, the degree to which the SBHC and school were integrated at their site, with 1 signifying “not at all integrated” and 10 signifying “perfectly integrated.” This was used as a general measure of integration, given that no gold standard for integration exists. Next, participants completed the SHIM. Finally, participant demographics were asked, including gender, age bracket, race/ethnicity, level of education, years working in the field, employment site, years at site, role at site, and years in that role.

Data analysis. We calculated the means and distribution of the school health integration scores within and between sites using data from the

SHIM pilot test. Cronbach's alpha was examined to determine internal reliability, and a nonrotated factor analysis was performed to assess the degree to which the tool measured a single coherent latent construct. We also examined correlations between each item in the SHIM. Finally, a linear regression accounting for clustering within sites tested whether the SHIM was associated with the overall rating of site integration.

RESULTS

Design of the SHIM

Eleven school health experts formed the panel for the modified Delphi process, representing SBHC medical providers, SBHC administrators, school district staff, a parent, a school mental health provider, a middle school administrator, and a school health researcher (see Table 1). The panel was ethnically diverse with a notable majority of women. While all panelists had multiple years of experience with SBHCs, the group included a diverse range of perspectives on school health. Clinicians brought first-hand knowledge of day-to-day operations on school campuses, while administrators and researchers provided insights from organizational and systemic levels. As came through in discussions, all participants entered the process with a working understanding of the concept of SBHC integration and what it looked like in practice.

Tables A2 and A3 provide a summary of the progression of items through each round. In the opening round, 50% of participants submitted multiple comments on the proposed items. Comments included panelists' experiences related to the items, positive and negative feedback on the suggested metrics, and recommendations for rewording and clarification. One theme was concern around feasibility for items, in line with the lower scores on the feasibility criterion mentioned below. Overall, comments or revisions were provided for 83% of the 36 items. Rates of commenting dropped precipitously as the rounds progressed.

With regards to scoring by criteria, the first-round appropriateness rating ranged from 5.1 to 8.6 (possible range 1-9); substantivity ranged from 4.6 to 8.3; and feasibility ranged from 3.4 to 8.8. The lower feasibility scores were most prominent in the domains of shared outcomes and staff collaboration. On this first round of scoring panelists' views varied less widely than in future rounds, with SDs greater than 2 across all 3 scoring criteria on only 36% of the items. This disagreement was most prominent in the domains of integrated programming, shared outcomes, and staff collaboration.

Subsequent rounds resulted in a near-universal narrowing of scoring ranges across all criteria, demonstrating opinions becoming progressively more moderate towards items remaining after each round's adoption

Table 1. Participant Characteristics for School Health Expert Panel and Pilot Test of School Health Integration Measure (SHIM)

School Health Expert Panel Participants (N = 11)		
	N	%
Role*		
Academic researcher	1	9
Medical clinician	3	27
Mental health clinician	1	9
Nonprofit administrator	2	18
Parent	1	9
SBHC administrator	3	27
SBHC clinician	2	18
School administrator	1	9
School district staff	3	27
Training by degrees held*		
Education	1	9
Health care management	1	9
Health science	1	9
Medicine	3	27
Nursing	5	45
Public administration	1	9
Public Health	2	18
Social work	2	18
Sex		
Female	9	82
Male	2	18
Race/ethnicity		
Asian	3	27
Black	1	9
Latinx	4	36
White	3	27
SHIM pilot test participants (N = 28)		
	N	%
Employer		
SBHC	14	50
School	13	46
No response	1	4
Years working in field		
1-5	4	14
6-10	3	11
11-20	9	32
21-30	12	43
Highest level of education		
High school	1	4
Some college	7	25
Bachelor's degree	4	14
Master's degree	13	46
Doctoral degree	3	11
Race/ethnicity		
Asian	5	18
Black	3	11
Latinx	17	61
Multi-racial	1	4
White	3	11
Age category (years)		
25-34	1	4
35-44	8	29
45-54	13	46
55-64	5	18
65 or older	1	4

The table provides participant characteristics for the 2 phases of the study.

*Individual panelists may represent multiple roles and hold multiple degrees. SBHC, School-Based Health Center.

Table 2. School Health Integration Measure (SHIM) Developed through Modified Delphi Process

	Domain 1: Health authority	1 (Never/Not at All)	2	3	4	5 (Always/Perfectly)
1a.	SBHC contributes subject matter expertise on school wellness policies and health-related programs and services (nutrition, physical activity, safety, discipline) that support student well-being.					
1b.	SBHC actively promotes campus-wide policies and practices that assure a safe and healthy school environment for all students and staff, including participation in school's crisis prevention and intervention plans.					
	Domain 2: Integrated programming					
2a.	A specific protocol exists for the SBHC to refer students for academic support in the school.					
2b.	A specific protocol exists for the school to refer students for health support in the SBHC.					
2c.	SBHC conducts schoolwide health campaigns or events.					
	Domain 3: Marketing and recruitment					
3a.	SBHC conducts active outreach in the school or community to inform <i>students</i> about the services it provides.					
3b.	SBHC conducts active outreach in the school or community to inform <i>school staff</i> about the services it provides.					
3c.	SBHC conducts active outreach in the school or community to inform <i>families</i> about the services it provides.					
3d.	SBHC successfully enrolls students in services who are identified in school population screens.					
	Domain 4: Shared outcomes					
4a.	SBHC and school regularly and actively exchange information about aggregate student well-being and outcomes.					
	Domain 5: Staff Collaboration					
5a.	SBHC and school staff spend time together collaborating on student support.					
5b.	SBHC has a formalized understanding of how it collaborates with school administration, teachers, and support staff -school nurses, psychologists, and counselors - to ensure the partnership meets student needs efficiently, effectively, and seamlessly.					

The School Health Integration Measure consists of 12 items across 5 domains. The measure was developed by a panel of 11 school health experts who reached consensus on the items through 4 rounds of a modified Delphi process. SBHC=School-Based Health Center.

and rejection. Simultaneously, a greater share of items being scored demonstrated less agreement among panel members as rounds progressed, with increasing SD on item scoring.

After 4 rounds of scoring, the panel ultimately reached a consensus on 12 items across the 5 originally proposed domains (see Table 2). From the initial 36-item pool drafted from the literature, in addition to the 12 items accepted by consensus, 10 were rejected by consensus and 13 failed to reach any consensus. Trends in scoring suggested that additional rounds would bring about no further agreement in those remaining items. First, the number of items reaching consensus in either direction had steadily decreased through the rounds, with only 1 item meeting the threshold in the final scoring round. Moreover, decreasing participation in terms of both panelists completing scoring and comments submitted suggested that participants had exhausted their sharing of views on the remaining items. Furthermore, as described above, SDs in scoring

across all 3 criteria for 100% of remaining items after the fourth round pointed to wide ranges of opinion, while narrowing ranges across all criteria suggested less likelihood of any of the final items meeting thresholds for inclusion or rejection. Finally, 12 of the remaining 13 items did not meet thresholds for consensus in at least 2 of the 3 scoring criteria, indicating that the lack of consensus was not limited to only one aspect of any metric. As the 12 accepted items met our a priori aim of 10 to 15 items across multiple domains, the panel confirmed our decision to conclude the scoring process after the fourth round.

Scoring analysis of the 13 items failing to achieve consensus revealed a few trends. Two panelists who worked primarily with individual SBHCs scored these items with the highest scores possible for adoption across all criteria. Three panelists serving in administrative capacities for SBHCs conversely scored most of the items with the lowest possible ratings aimed at rejection across all criteria. Two

other panelists from differing backgrounds scored none of the 13 final items strongly in either direction. Representing 7 of the 11 panelists, these final scoring patterns blocked consensus in either direction.

Overall, no clear trends emerged concerning panelist backgrounds and scoring tendencies that shaped the overall outcome. However, panelists who worked directly with SBHCs or schools on a day-to-day basis tended to score items higher. Based on their comments during group discussions, this may be related to aspirations for integration in all forms. The opposite trend of scoring lower (ie, towards rejection) was observed for some panelists who served in an administrative capacity, possibly reflecting a desire to narrow the concept of integration to a more manageable set of metrics.

Pilot Testing of the SHIM

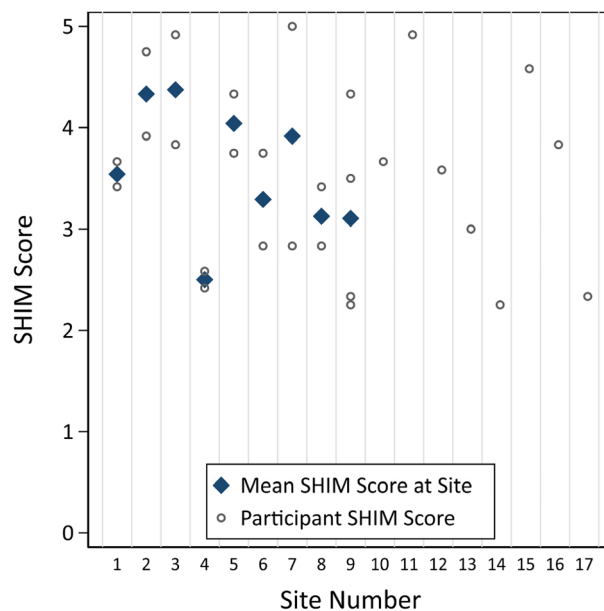
The SHIM was pilot tested with 28 participants from 17 SBHC campuses representing all levels preK-12, with the majority of participants (89%) working at sites with high schools. As intended, roughly half of respondents were employed by SBHCs and the other half by schools. Of note, 75% of participants worked in school health for at least 10 years, suggesting substantial levels of experience and insight. Nine sites included responses from both SBHC and school participants.

Overall, SHIM scores ranged from 2.25 to 5 out of a possible 1 to 5 with a mean of 3.5 and SD of 0.87 (see Figure 1). The measure had high internal consistency with Cronbach's alpha of 0.94. Nonrotated factor analysis revealed only one factor with an Eigenvalue above 2 (Eigenvalue was 7.45 for that factor and 1.01 for the next highest factor). In addition, all items in the SHIM loaded on this single factor, indicating no need to weight items, despite unequal distribution of items across domains. Finally, the SHIM score was significantly correlated with the overall 1 to 10 global integration assessment rating ($R^2 = 0.54$) (see Appendix 4, Figure A1). A linear regression of the overall integration score on the SHIM accounting for clustering within sites revealed that a 1-unit increase in SHIM score was associated with a 1.29 increase in the overall integration score ($p = .001$).

DISCUSSION

The modified Delphi process produced consensus among a panel of 11 school health experts around 12 items to characterize SBHC integration along 5 domains. All SHIM items were adopted with fairly ready agreement by panel members, drawn from the literature with only minor edits and revisions required. The fact that most consensus for adopting items occurred in early rounds suggests that the initial

Figure 1. School Health Integration Measure (SHIM) Scores across Sites. This figure presents the SHIM score from the 28 individual participants across 17 school-based health center (SBHC) sites. Means are also displayed for the 9 sites with multiple respondents. Participant SHIM scores were generally similar for most sites with multiple respondents.



pool of items was successful in matching the concept of integration. The primary issues preventing consensus on items that ultimately remained unresolved seem to revolve around issues of feasibility, or the degree to which integration can be expected between SBHCs and partner schools. Although the tool was intended to be aspirational as well as evaluative, the panel ultimately signaled that some items were beyond the scope of what could be expected of even the most highly integrated SBHC sites. In the subsequent SHIM pilot survey, the tool demonstrated construct and internal validity around a single concept of integration and also correlated with SBHC staff's general impression of integration at their respective sites.

The efficacy of bringing health services to school campuses through SBHCs has been well documented, yet the full potential of this care model to interconnect health and educational services has largely only been described in aspirational terms or through individual case studies. The SHIM offers an initial attempt at a means to objectively measure, investigate, and promote the "something more" promised by aligning and coordinating health and educational services.

This study expands upon work examining the integration of other traditionally distinct services within health care and education. Attempts to incorporate behavioral health into the medical home, for example, have provided general guidance on the successful

integration of sectors, such as clarification of roles, adoption of shared goals, and ongoing training and research for improvement.²⁰⁻²³ Efforts to integrate mental health within schools have stressed the importance of building upon existing resources, promoting adoption through social networks, addressing administrative and procedural hurdles, and acknowledging structural issues like financing and policy that arise with integration efforts.²⁴⁻²⁶ These lessons informed our efforts to develop the SHIM. We hope the tool now provides the foundation for further study of the integration of health and education services at SBHCs, work that will ultimately inform broader efforts of integration across the health and education sectors.

Limitations

This study sought to operationalize the concept of school health integration, offering SBHCs a practical framework by which to define integration, an evaluative tool to assess their own progress, and an aspirational model to drive improvement efforts. We recognize, however, that our work represents a geographically limited view of school health, namely the larger urban and underserved communities served by SBHCs in Los Angeles. While LAUSD is one of the largest providers of school-based health care in the nation³⁰ and oversees a broad spectrum of SBHCs both in terms of scope of services and suspected levels of integration, our framing of integration may miss factors integral to other settings. Similarly, the psychometric properties of the SHIM may not generalize to other regions and demographic groups. Beyond these geographic limitations, recruitment and scheduling challenges prevented us from including students on the school health expert panel and resulted in limited representation of teachers, principals, and parents. Future work should aim to include these critical perspectives.

The literature review and initial draft of school-health integration items were limited by what was available on this topic in the published literature. Although we provided expert panel members the opportunity to introduce new metrics, future work may identify additional items or even entirely new domains through which to conceptualize integration. This dearth of previous work on the topic also limits our ability to formally validate the SHIM against a gold standard, leaving the survey participants' general impression as captured by a single survey item as our only means of comparison. Furthermore, the field testing of the SHIM was only intended as a pilot and thus did not involve enough participants nor enough same-site pairs to draw any firm conclusion on the tool's performance beyond the introductory analysis provided here. Finally, we did not test whether

the SHIM is associated with academic or health outcomes.

Conclusions

The SHIM introduces a new tool to quantify the degree to which health and educational services are integrated at SBHC sites. Measuring school health integration might be used to drive practice improvement initiatives, identify SBHC and school characteristics associated with better integration, and test whether better integration is associated with student health and academic achievement.

IMPLICATIONS FOR SCHOOL HEALTH AND EQUITY

Our SHIM presents a novel, evidence-based, practical tool by which to study the previously only aspirational notion that integrating school-based health centers into the broader efforts of the school positively impacts the health and education of youth. It seems natural to believe that coordinating the efforts of schools and clinics would help young people; our tool presents the first formal tool to measure this coordination and test whether it does indeed lead to better outcomes. In the landscape of limited resources in which SBHCs have always operated, now exacerbated by the impact of COVID-19, such evidence is critical in planning interventions that will actually improve outcomes for youth. The pandemic has highlighted the critical role schools play as anchor institutions and the importance of collaborative work across the education and health sectors to ensure that children can safely return to in-person school.

Insight into integration and the SHIM tool itself can directly inform the planning of SBHC and school administrators as well as the day-to-day operations of SBHC and school staff. Conversations around the creation of the tool and actions generated from our pilot study have already driven and enhanced partnerships to maximize the impact of SBHCs. Given the new context of distance and hybrid learning during the pandemic, carefully planned integration becomes all the more important in the delivery of services, particularly to those most vulnerable. The measure can similarly be utilized by parent and student leaders as a means to assess the success of their schools and SBHCs in coordinating services. All of those involved with and benefiting from SBHCs can use integration as a new data point to fuel advocacy efforts seeking to support school health initiatives.

More broadly, a new emphasis on school health integration may provide novel avenues to address fundamental challenges of the SBHC model while capitalizing on its strengths. SBHCs have faced obstacles to financial stability since their inception.^{31,32} Integration with educational services could be incorporated

into alternative payment models being explored that extend health care financing into related sectors.³³ Our research effort to document the role of health services impacting educational success by ridding of the silos we place around health care and education can inform similar “de-siloing” within policy, financing, and training. Moreover, direct coordination with partner schools in SBHC recruitment efforts can expand utilization rates and broaden the scope of care delivered by SBHCs. The more familiar the clinic is with the school and the school with the clinic, the better they are both positioned to get young people to the clinic and utilize fully the services available.

In terms of strengths, greater coordination with partner schools can further enhance the role of SBHCs in increasing access to care for marginalized populations. The pandemic has magnified the inequities that exist across our health care system and society in general. SBHCs have been shown to have a particular impact on those communities³⁻⁵; thus, integration offers a novel path to build upon that success. Finally, aligned with the Community Schools movement aimed at leveraging neighborhood resources to advance the academic success and broader well-being of students and families,³⁴ integration with partner schools may enable SBHCs to better tailor their services and approaches to the unique needs and opportunities of their particular school communities.

Human Subjects Approval Statement

This study was reviewed and determined to be exempt by the UCLA Internal Review Board (IRB#19-001199). The study was also reviewed and approved by the LAUSD Committee for External Research Review (#705).

Conflict of Interest

All authors of this article declare they have no conflicts of interest.

REFERENCES

1. Council on School Health. School-based health centers and pediatric practice. *Pediatrics*. 2012;129(2):387-393.
2. Keeton V, Soleimanpour S, Brindis CD. School-based health centers in an era of health care reform: building on history. *Curr Probl Pediatr Adolesc Health Care*. 2012;42(6):132-156.
3. Knopf JA, Finnie RK, Peng Y, et al. School-based health centers to advance health equity: a community guide systematic review. *Am J Prev Med*. 2016;51(1):114-126.
4. Brindis CD. The “state of the state” of school-based health centers achieving health and educational outcomes. *Am J Prev Med*. 2016;51(1):139-140.
5. Koenig KT, Ramos MM, Fowler TT, Oreskovich K, McGrath J, Fairbrother G. A statewide profile of frequent users of school-based health centers: implications for adolescent health care. *J Sch Health*. 2016;86(4):250-257.
6. Wade TJ, Mansour ME, Guo JJ, Huentelman T, Line K, Keller KN. Access and utilization patterns of school-based health centers at urban and rural elementary and middle schools. *Public Health Rep*. 2008;123(6):739-750.
7. Parasuraman SR, Shi L. The role of school-based health centers in increasing universal and targeted delivery of primary and preventive care among adolescents. *J Sch Health*. 2014;84(8):524-532.
8. Wade TJ, Mansour ME, Line K, Huentelman T, Keller KN. Improvements in health-related quality of life among school-based health center users in elementary and middle school. *Ambul Pediatr*. 2008;8(4):241-249.
9. Clayton S, Chin T, Blackburn S, Echeverria C. Different setting, different care: integrating prevention and clinical care in school-based health centers. *Am J Public Health*. 2010;100(9):1592-1606.
10. Bradley BJ, Greene AC. 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. *J Adolesc Health*. 2013;52(5):523-532.
11. Braveman P, Egerter S, Williams DR. The social determinants of health: coming of age. *Annu Rev Public Health*. 2011;32(1):381-398.
12. Halfon N, Hochstein M. Life course health development: an integrated framework for developing health, policy, and research. *Milbank Q*. 2002;80(3):433-479.
13. Lewallen TC, Hunt H, Potts-Datema W, Zaza S, Giles W. The whole school, whole community, whole child model: a new approach for improving educational attainment and healthy development for students. *J Sch Health*. 2015;85(11):729-739.
14. Core competency: “school integration.” from School-Based Health Alliance Core Competencies. Washington, DC; 2017. Available at: <http://www.sbh4all.org/resources/core-competencies>. Accessed January 1, 2021.
15. Community School Standard 8: “Integrated health and social supports.” From Institute for Educational-Leadership Community School Standards. Washington, DC; 2017. Available at: <http://www.communityschools.org/assets/1/1/Community-School%20Standards-Updatesd2017.pdf>. Accessed January 1, 2021.
16. Valentijn PP, Schepman SM, Opheij W, Bruijnzeels MA. Understanding integrated care: a comprehensive conceptual framework based on the integrative functions of primary care. *Int J Integr Care*. 2013;13:e010.
17. Suter E, Oelke ND, da Silva Lima MA, et al. Indicators and measurement tools for health systems integration: a knowledge synthesis. *Int J Integr Care*. 2017;17(6):4.
18. Bautista MAC, Nurjono M, Lim YW, Dessers E, Vrijhoef HJ. Instruments measuring integrated care: a systematic review of measurement properties. *Milbank Q*. 2016;94(4):862-917.
19. Sternberg SB, Co JPT, Homer CJ. Review of quality measures of the most integrated health care settings for children and the need for improved measures: recommendations for initial core measurement set for CHIPRA. *Acad Pediatr*. 2011;11(3):S49-S58.e3.
20. Kessler RS, Auxier A, Hitt JR, et al. Development and validation of a measure of primary care behavioral health integration. *Fam Syst Health*. 2016;34(4):342-356.
21. Macchi CR, Kessler R, Auxier A, et al. The practice integration profile: rationale, development, method, and research. *Fam Syst Health*. 2016;34(4):334-341.
22. Kessler R. Evaluating the process of mental health and primary care integration: the Vermont integration profile. *Fam Med Community Health*. 2015;3(1):63-65.
23. Baird M, Blount A, Brungardt S, et al. Joint principles: integrating behavioral health care into the patient-centered medical home. *Ann Fam Med*. 2014;12(2):183-185.
24. Weist MD, Goldstein A, Morris L. Integrating expanded school mental health programs and school-based health centers. *Psychol Sch*. 2003;40(3):297-308.

25. Atkins MS, Hoagwood KE, Kutash K, Seidman E. Toward the integration of education and mental health in schools. *Adm Policy Ment Health*. 2010;37(1):40-47.
26. Weist MD, Mellin EA, Chambers KL, Lever NA, Haber D, Blaber C. Challenges to collaboration in school mental health and strategies for overcoming them. *J Sch Health*. 2012;82(2):97-105.
27. Fitch K, Bernstein SJ, Aguilar MD, Burnand B, LaCalle JR. *The RAND/UCLA appropriateness method user's manual*. RAND Corp Santa Monica CA; 2001.
28. The L.A. Trust. The Mission of the LA Trust Available at: <https://thelatruster.org/about-landing-page/about>.
29. Boulkedid R, Abdoul H, Loustau M, Sibony O, Alberti C. Using and reporting the Delphi method for selecting healthcare quality indicators: a systematic review. *PLoS One*. 2011;6(6):e20476.
30. Love H, Soleimanpour S, Schlitt J, Panchal N, Behr C. *2016-17 National School-Based Health Care Census Report*. Washington, DC: School-Based Health Alliance; 2018. Available at: <https://www.sbh4all.org/wp-content/uploads/2019/05/2016-17-Census-Report-Final.pdf>.
31. Acosta PO. *School-Centered Approaches to Improve Community Health: Lessons from School-Based Health Centers*. Washington, DC: Brookings Institution; 2016. Available at: https://hsrc.himmelfarb.gwu.edu/cgi/viewcontent.cgi?article=1009&context=sphhs_centers_chhcs.
32. Community Preventive Services Task Force. School-based health centers to promote health equity: recommendation of the community preventive services task force. *Am J Prev Med*. 2016;51(1):127-128.
33. Counts NZ, Billioux A, Perrin JM. Short-term and long-term returns for states implementing pediatric alternative payment models. *JAMA Pediatr*. 2020;174(5):403-404.
34. Diamond C, Freudenberg N. Community schools: a public health opportunity to reverse urban cycles of disadvantage. *Bull N Y Acad Med*. 2016;93(6):923-939.

APPENDICES

Appendix 1. School Health Integration Measure Draft Pool of Domains and Metrics from the Literature

Table A1. Thirty-six integration measures were drafted based on the literature review of service integration: case studies of highly integrated school-based health centers (SBHCs), best-practice standards for school health organizations and community schools, measurement of integrating behavioral health and primary care, and integration of mental health into schools. Consensus for acceptance or rejection of each item was based on the school health expert panel's assessment across three criteria: appropriateness, substantivity, and feasibility.

Domain 1: Health authority	Consensus
1a. SBHC contributes subject matter expertise on health education curriculum	Rejected
1b. SBHC contributes subject matter expertise on school wellness policies and health-related programs and services (nutrition, physical activity, safety, discipline) that support student well-being	Accepted
1c. SBHC actively promotes campus-wide policies and practices that assure a safe and healthy school environment for all students and staff	Accepted after modifications
1d. SBHC serves as partner in the management of school's crisis prevention and intervention plans	Accepted after modifications
Domain 2: Integrated programming	
2a. A specific protocol exists for the SBHC to refer students for academic support in the school	Accepted
2b. A specific protocol exists for the school to refer students for health support in the SBHC	Accepted
2c. SBHC regularly delivers health education in the classroom	Rejected after modifications
2d. SBHC regularly runs group programs for students on health and mental health	Rejected
2e. SBHC partners with the school to achieve improved outcomes for students struggling with <i>academic performance</i> issues	Rejected
2f. SBHC partners with the school to achieve improved outcomes for students struggling with <i>attendance</i>	No consensus reached
2g. SBHC partners with the school to achieve improved outcomes for students struggling with <i>behavior</i>	No consensus reached
2h. SBHC conducts schoolwide health campaigns or events	Accepted
2i. SBHC has presentations or events to educate parents and family members	No consensus reached
2j. SBHC helps students develop leadership skills and have opportunities for student career pathway development	No consensus reached
Domain 3: Marketing and recruitment	
3a. SBHC conducts active outreach in the school or community to inform <i>students</i> about the services it provides	Accepted
3b. SBHC conducts active outreach in the school or community to inform <i>school staff</i> about the services it provides	Accepted
3c. SBHC conducts active outreach in the school or community to inform <i>families</i> about the services it provides	Accepted
3d. SBHC screens the student population for those eligible for services using a standardized procedure	No consensus reached after modifications
3e. SBHC successfully enrolls students in services who are identified in school population screens	Accepted
3 f. SBHC has specific protocols to follow-up on students who have utilized services in line with a medical home model	Rejected
3 g. SBHC has specific systems to identify and intervene on identified students who did not initiate or complete participation in services	Rejected

Table A1. Continued

	Domain 1: Health authority	Consensus
	Domain 4: Shared outcomes	Consensus
4a.	SBHC and school regularly and actively exchange information about <i>aggregate</i> student well-being and outcomes	Accepted
4b.	SBHC and school regularly and actively exchange information about <i>individual</i> student well-being and outcomes	No consensus reached
4c.	SBHC and school personnel participate jointly in the development and governance of policies, procedures, and structures that support <i>student academic achievement</i>	Rejected
4d.	SBHC and school personnel participate jointly in the development and governance of policies, procedures, and structures that support <i>student health</i>	Rejected
4e.	SBHC shares a specific vision and mission of student <i>academic success</i> with the school	No consensus reached
4f.	SBHC shares a specific vision and mission of student <i>wellness</i> with the school	No consensus reached
	Domain 5: Staff collaboration	Consensus
5a.	SBHC participates in an interdisciplinary student support team, including specialized instructional support personnel, community partners, other school staff, and involving families where appropriate, that develops and oversees a plan to respond to individual student needs	No consensus reached
5b.	SBHC participates in shared educational or professional development training with school staff	No consensus reached
5c.	SBHC and school staff spend time together collaborating on student support	Accepted
5d.	SBHC has a formalized understanding of how it collaborates with school administration, teachers, and support staff school nurses, psychologists, and counselors - to ensure the partnership meets student needs efficiently, effectively, and seamlessly	Accepted
5e.	SBHC partners with school staff to recruit students for services	Rejected after rescoring
5f.	SBHC staff and school administrators meet regularly to discuss policy and procedures	No consensus reached
5g.	SBHC assesses the health and wellness needs of the school staff	Rejected
5h.	SBHC offers services to school staff, such as support groups, stress management activities, and health literacy	No consensus reached
5i.	SBHC supports teachers' health and wellness (eg, support groups, stress management, workplace wellness)	Rejected

Appendix 2. Modified Delphi Process Outcomes by Round of Scoring

Table A2. The school health expert panel utilized 4 rounds of the modified Delphi process to reach consensus around items for inclusion in the School Health Integration Measure.

	Round 1	Round 2	Round 3	Round 4	Cumulative
Items at start of round	36	28*	19	14	n/a
Items accepted by consensus (firm [†] /soft [‡])	9* (2/7)	3 (2/1)	2 (0/2)	0	12
Items rejected by consensus (firm [§] /soft)	0	6 (0/6)	3 (0/3)	1 (0/1)	10
Panelists completing scoring (%)	10 (91)	10 (91)	10 (91)	8 (73)	11 (100) [¶]
Items with suggested comments/revisions (%)	30 (83)	5 (18)	0	0	31 (86) [#]
Items with widely varied scoring** (%)	13 (36)	20 (71)	19 (100)	14 (100)	n/a
Appropriate criteria scoring range	5.1-8.6	1.1-8.6	3.0-8.0	2.6-7.5	1.1-8.6
Substantive criteria scoring range	4.6-8.3	1.1-8.3	1.9-7.4	2.6-6.8	1.1-8.3
Feasible criteria scoring range	3.4-8.8	1.1-8.8	2.5-8.1	2.6-7.5	1.1-8.8

*At in-person meeting following round 1, panelists decided to rescore 2 items that achieved consensus and combine 2 items into 1 single item.

[†]Firm consensus for acceptance defined as mean score ≥ 7 and SD ≤ 2 across all 3 criteria.

[‡]Soft consensus for acceptance defined as mean score ≥ 7 across all 3 criteria and SD ≥ 2 on ≥ 1 criteria.

[§]Firm consensus for rejection defined as mean score ≤ 3 and SD ≤ 2 across all 3 criteria.

^{||}Soft consensus for rejection defined as mean score ≤ 3 across all 3 criteria and SD ≥ 2 on ≥ 1 criteria.

[¶]Each panelist completed scoring in ≥ 2 rounds.

[#]Of the original 36 items scored, 31 received suggested comments or revisions in ≥ 1 round of scoring.

**Widely varied scoring defined as SD ≥ 2 across all 3 criteria.

Appendix 3. Consensus Reached on Items Across Domains

Table A3. Items proposed and considered for inclusion in the School Health Integration Measure were divided into 5 thematic domains.

Domain	Total Items Proposed	Items Accepted by Consensus (%)	Items Rejected by Consensus (%)	Items Failing to Achieve Consensus (%)
Health authority	4*	2 (67)	1 (33)	0
Integrated programming	10	3 (30)	3 (30)	4 (40)
Marketing and recruitment	7	4 (57)	2 (29)	1 (14)
Shared outcomes	6	1 (17)	2 (33)	3 (50)
Staff collaboration	9	2 (22)	2 (22)	5 (56)

*The school health expert panel reached a consensus on combining 2 of the originally proposed items in the health authority domain into 1 item.

Appendix 4. Correlation of Participant School Health Integration Measure Scores and General Assessment of Integration

Figure A1. Participants were asked to rate the level of integration of health and education services at their school campuses from 1 (“not at all integrated”) to 10 (“perfectly integrated”) in a general assessment of integration rating prior to completing the School Health Integration Measure (SHIM). SHIM scores for integration range from 1 (“never/not at all”) to 5 (“always/perfectly”). A linear regression accounting for clustering within sites was conducted to test whether the SHIM score was associated with the general assessment of integration rating.

