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Impact of State Gatekeeper Training Laws on Suicide Prevention Training for School Staff

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Abstract

Purpose: To evaluate the impact of gatekeeper training laws (GTLs) on the prevalence of suicide prevention training (SPT) among school staff.

Methods: This study used representative state-level data on the prevalence of SPT at schools from 2010 to 2022 School Health Profiles biennial reports and state-level legal data on GTLs from previous research. A difference-in-difference analysis was conducted to compare temporal changes in the state prevalence of SPT among lead health education teachers between states with GTL mandates and states without GTL mandates.

Results: GTL mandates led to a 13.7 [95% confidence interval: 7.7, 19.8] percentage point increase in the percent of public secondary schools in which the lead health education teacher received SPT relative to states without a GTL mandate. Event study results suggest that the mandates had a sustained impact on the prevalence of SPTs across all postmandate periods.

Discussion: GTL mandates led to an increase in the uptake of SPT among school staff, suggesting these mandates may be an effective approach to increase the prevalence of school staff trained in suicide prevention.

Keywords

Policy evaluation; Youth suicide; Schools; Gatekeeper trainings

Suicide is a leading cause of death among youth ages 10–19 in the United States [1]. While youth share many suicide risk factors with the general population—such as mental health conditions and substance use—they are also particularly vulnerable to factors associated with their neurological, psychological, and social developmental stage. These include impulsivity, heightened sensitivity to others' expectations, underdeveloped problem-solving and coping skills, challenges in relationships with family and peers, and school performance

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[2]. As such, suicide prevention efforts for youth benefit from being tailored to their specific life contexts.

Gatekeeper training is an evidence-based strategy that can be implemented in schools to prevent youth suicide [3]. In this approach, peers, teachers, and other school staff who routinely interact with students are trained to proactively identify students at risk of suicide and provide referrals to appropriate services [4,5]. Gatekeeper trainings have demonstrated positive impact on school staff's suicide prevention knowledge [6–8], attitudes [6,8], and self-efficacy [7], as well as the likelihood that staff refer at risk youth to services [9].

Many states have enacted laws expanding school-based gatekeeper trainings by encouraging or requiring school staff to receive suicide prevention training (SPT). During the past 2 decades, the number of states that have enacted laws encouraging or mandating gatekeeper training in schools (gatekeeper training laws, or GTLs) has increased from six states in 2002 to 49 states in 2022, with the period between 2012 and 2017 representing the most substantial increase in the adoption GTLs [10]. Of the 49 states with GTLs in 2022, over half mandated training for school staff (Supplemental Table 1), potentially as a mechanism to increase training uptake. While the proliferation of GTLs is promising as an approach to increase training uptake, various factors that differ across states can influence how successfully a law is implemented.

The degree to which programs or strategies are implemented as intended is known as implementation fidelity [11]. Coverage of GTLs—the extent to which intended recipients of the intervention (i.e., school staff) actually receive the intervention (i.e., gatekeeper training)—is an important component to assessing implementation fidelity of GTLs. Because the immediate goal of these laws is to train school staff in suicide prevention, understanding whether GTLs actually result in increased training establishes foundational context for future evaluations of the impact on the ultimate goal of reducing youth suicide. Assessing implementation fidelity can also provide key information for decision-makers and public health practitioners considering tools to expand SPT. To our knowledge, no study has yet evaluated the effectiveness of state GTLs in increasing the coverage of SPTs among schools. This study aims to evaluate the impact of state GTLs on the uptake of SPT among school staff across the United States.

Methods

Data

This study utilized aggregated state-level data on the prevalence of SPT in public secondary schools from the Centers for Disease Control and Prevention's (CDC's) School Health Profiles (SHPs) biennial reports from 2010 to 2022 [12]. The SHP is a self-administered survey of principals and lead health education teachers used to assess school health policies and practices across secondary schools in the United States. The SHP survey uses random, systematic, equal-probability sampling strategies to select representative samples of public secondary schools in each jurisdiction. The SHP reports are produced by CDC with each new survey data release and provide a detailed description of the methods, new trends in outcomes, and state-level summary statistics that are representative of public secondary

schools within each state. For each survey-year, data from some states were excluded in the reports if they were not surveyed or if representative state-level data were not able to be produced. Table 1 outlines state participation, the number of lead health educators surveyed, and response rates for each state.

From these reports, we collected state-level data from each survey-year on the percentage of public secondary schools in a state in which the lead health education teacher received professional development in suicide prevention during the 2 years before the survey (hereafter referred to as SPT prevalence). The data do not include specifics on the type or delivery of the training. This survey outcome is specific to health education teachers, which limits applicability to a broader generalization of the impact on all school staff; however, health education teachers would be impacted by GTLs that target all staff and most GTLs apply broadly to school employees, including and beyond teachers [13]. Additionally, with the exception of data focused on lead health educators in the SHP, longitudinal data sufficiently able to facilitate cross-state comparative analyses on SPT in schools are limited. For these reasons we believe this outcome to be the best SPT prevalence proxy available to evaluate the effectiveness of GTLs at increasing training uptake. In addition to data on SPT, we also collected data from the SHP reports on similar variables that reported professional development prevalence among lead health education teachers at the state-level across other health topics for falsification tests; these topics included nutrition and dietary behavior, physical activity, pregnancy prevention, and sexually transmitted disease prevention.

Data on GTLs from all 50 states were collected from previous research that used a legal epidemiology approach [10]. Legal data collected included passage dates, effective dates, whether training was mandated or encouraged, and duration and frequency of trainings. Laws were included for analysis if they pertained to training related to suicide prevention for school staff for any grade level. Strict mandates were defined as laws that required some or all school staff to be trained or included mechanisms to require training. Conditional mandates were defined as laws that appeared to mandate training but with conditions that may limit real world implementation of the mandate (e.g., mandatory training conditional on availability of funding). Encouraged laws were defined as laws that did not mandate training, but rather expressly encouraged staff to be trained or included mechanisms through which training would be encouraged [10].

Finally, we collected yearly data from 2005 to 2022 on whether states received funding through the Garrett Lee Smith (GLS) Youth Suicide Prevention Program from the Substance Abuse and Mental Health Services Administration's grant portal [14,15]. The GLS program was rolled out across jurisdictions starting in 2004 and supports states and tribes in implementing youth suicide prevention strategies in schools, juvenile justice systems, substance abuse programs, and more [16]. Previous research has highlighted wide-reaching distribution of GLS grants across the United States with gatekeeper trainings as one of the most commonly implemented suicide prevention strategies among grant recipients (though not necessarily the only strategy) [17,18], making it important to account for the program's potential impact in our modeling approach.

Data on GTLs and GLS funding were merged with the SHP report data to create an unbalanced state-by-year panel dataset with 291 state-year observations across 48 states (Table 1) (West Virginia and North Dakota were excluded from analysis. West Virginia repealed its GTL over the study period and North Dakota instituted a law encouraging training that replaced a conditional mandatory law.). This activity was reviewed by CDC, deemed research not involving human subjects, and was conducted consistent with applicable federal law and CDC policy (45 C.F.R. part 46.102(l) (2), 21 C.F.R. part 56; 42 U.S.C. Sect. 241 (d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.)

Analysis

We utilized a difference-in-difference (DID) empirical design to evaluate the association between GTL mandates and state SPT prevalence. DID is a commonly used empirical strategy to evaluate the impact of policy changes across a wide range of disciplines [19,20]. DID makes comparisons in outcomes between an “intervention” and “control” group, before and after a policy change to evaluate the policy’s impact. For the purposes of our study, “intervention” states are those that instituted strict or conditional GTL mandates (hereafter referred to as “GTL mandates”) throughout the study period, and “control” states are those that did not institute GTL mandates (“Instituting” GTLs refers to the date the legal provision on training went into effect, which may differ from the law’s passage date). The control states included states that passed laws “encouraging” SPTs for school staff, as these laws did not mandate trainings. We empirically implemented the DID strategy using a linear regression model, regressing the state SPT prevalence variable on our policy variable indicating if a state mandated gatekeeper training. Additionally, we controlled for state fixed effects, survey-year fixed effects, and whether a state received funding through the GLS program (formal model presented in the technical appendix). Standard errors were clustered at the state level. To correct the presence of potential bias arising from heterogeneous treatment effects [21–23], we estimated additional models using the Callaway and Sant’Anna (CS) approach (We estimate the Callaway and Sant’Anna model under two separate specifications: the not yet treated and never treated analyses. In the not yet treated analysis, the control group consists of states that never instituted a GTL mandate and states that have yet to institute a GTL mandate for the years prior to the mandate’s effective date. For the never treated analysis, the control group consists of just states that never instituted GTL mandates.), which accounts for heterogeneity in treatment effects across multiple time periods by identifying and then aggregating group-time average treatment effects, and has become a commonly used methodology when policies have a staggered effective date across states over time [22,24].

Furthermore, a main assumption of the DID model is that of parallel trends in outcomes which posits that trends in SPT prevalence would have been the same between the “intervention” and “control” states in the absence of GTL mandates. We indirectly tested this assumption by estimating an event study model with CS bias corrections. The event study model is an extension of the DID model that evaluates lead and lag effects of the GTL mandate (further described in the technical appendix). Coefficient estimates that are not statistically different from zero on the lead policy variables are a necessary condition

for the validity of DID models and would suggest that the parallel trend assumption is not violated [20].

Finally, we conducted a sensitivity analysis evaluating strict GTL mandates (i.e., conditional mandates included in the control group). We also conducted a set of falsification tests in which the DID models specified previously were estimated with other nonrelated health training outcomes (e.g., state prevalence of sexually transmitted disease prevention trainings) as the dependent variable. If GTL mandates were the primary mechanism leading to changes in the SPT prevalence across states, we would not expect to see that the mandates were also associated with changes in the prevalence of other nonrelated trainings. All analyses were conducted using Stata/MP 17.0.

Results

Of the 48 states included in the study sample, 39 (81%) had a GTL mandate in place and 30 (63%) had a strict GTL mandate in place at some point over the study period (Supplemental Table 2). Of the 39 states with a GTL mandate, 33 had their mandate become effective during the study period (2010–2022). SPT prevalence increased from 2010 to 2020 in both states that instituted GTL mandates (31.0 percentage points [95% confidence interval {CI}: 25.2, 36.8]) and in states that did not institute GTL mandates (22.6 percentage points [95% CI: 15.7, 29.5]). However, in 2022, SPT prevalence remained constant in GTL mandate states while decreasing by 8.9 percentage points [95% CI: – 16.6, – 1.3] in non-GTL mandate states (Figure 1).

Results from the two-way fixed effects model suggest that GTL mandates led to a 15.2 (95% CI: 10.9, 19.5) percentage point increase in SPT prevalence relative to nonmandate states (Table 2). The CS-DID models produced similar estimates to the baseline model, suggesting that GTL mandates led to a 13.7 [95% CI: 7.7, 19.8] (when including not yet treated states in the control group) and 14.3 [95% CI: 8.1, 20.5] (when only including never treated states in the control group) percentage point increase in SPT prevalence relative to nonmandate states (Table 2). The CS-DID model including not yet treated states in the control group represents the preferred model specification, as it utilizes the most data while accounting for heterogeneous treatment effects.

The event study model was estimated with CS-bias corrections and not yet treated states included in the control group (Figure 2). The coefficient estimates on the lead-policy variables from the event study analysis are statistically indistinguishable from zero, suggesting that the parallel trend assumption of the DID model is likely not violated. Additionally, the event study results demonstrate that the mandates impacted SPT prevalence in all postmandate periods, with coefficient estimates suggesting that GTL mandates led to percentage point increases in SPT prevalence ranging from 10.4 [95% CI: 1.2, 19.5] to 15.6 [95% CI: 9.4, 21.7] within the first 6 years post policy implementation and a 28.1 [95% CI: 21.6, 34.6] percentage point increase during the 10th year post policy, relative to the referent group.

These results were robust across sensitivity analyses that evaluated strict GTL mandates (Table 2; Supplemental Figure 1). Furthermore, results from the falsification tests suggest that GTL mandates were not associated with changes in the percent of public secondary schools in a state in which the lead health education teacher received other non-suicide prevention—related trainings (Table 3).

Discussion

To our knowledge, this is the first study that evaluated whether instituting GTLs led to increased implementation of SPTs. Findings from this study indicate that GTL mandates were associated with a 13.7 percentage point increase in SPT prevalence relative to non-GTL mandate states. Furthermore, we do not find evidence that GTL mandates were associated with an increase in other non-suicide prevention—related trainings, providing evidence that the mandates were likely the primary mechanism driving our main findings, rather than potential unobserved confounders.

Increased coverage of gatekeeper trainings among school staff, as a measure of implementation fidelity of GTLs, is an essential first outcome to reach the ultimate goal of GTLs: reducing rates of suicide among youth. Data from state-level anti-bullying legislation, which would have similar implementation fidelity concerns as school gatekeeper trainings, are encouraging, with research suggesting higher levels of anti-bullying legislation implementation fidelity were inversely related to student bullying [25,26]. Findings from our study suggest that GTLs were associated with increased coverage of SPT at schools. This evidence may inform decision makers and school administrators considering levers to expand implementation of gatekeeper training as part of a school-based approach to suicide prevention.

Interestingly, states that did not have GTL mandates still saw an increase in the SPT prevalence over the study period. There are two likely reasons for this. First, the sample of states that did not have GTL mandates included states with GTLs encouraging training, suggesting that these laws may have been effective to a lesser degree at increasing training coverage. Second, it may be that national trends and local, contextual factors resulted in secondary schools opting to implement training regardless of whether their state required it. A confluence of increasing youth suicide rates starting in 2007 [27], increased national attention to and investment in suicide prevention activity [4,28], and the promotion of gatekeeper trainings through grant programs, suicide prevention recommendation reports, and evidence-based resources may have influenced optional uptake of SPT at the school district level [3,4,16].

Another interesting implication of our findings is that GTL mandates may have helped prevent a lapse in SPT prevalence in states with mandates during the early years of the COVID-19 pandemic. This is suggested by the SPT prevalence trends in 2022 (based on a 2-year recall period) between GTL mandate and nonmandate states, and further supported by our event study results, where we find that the mandate's largest impact manifested in the period 10 years after the policy, estimated exclusively from the cohort of states that instituted their GTL in 2012. It has been well documented that the pandemic disrupted

schooling in a variety of ways [29]. One potential reason for this finding is that schools in states without GTL mandates may have been less likely to continue optional trainings as a result of difficulties a virtual school environment may have posed to the dissemination of training. Constraints on school resources because of the pandemic and disruptions to schooling may also have played a role in the decrease in training uptake among nonmandate states. However, states with GTL mandates in place may not have had the option to allow SPTs to lapse and thus maintained the status quo on training prevalence between 2020 and 2022. This further suggests that GTL mandates may play a role in ensuring the sustainability of gatekeeper training programs throughout future public health crises or constraints on school resources.

At the end of the study period, an average of 61.2% of public secondary schools in states with GTL mandates had lead health education teachers trained, which, although a substantial increase from the average of 31.3% at the beginning of the study period, remains lower than might be expected given the mandatory nature of these laws. There are several potential reasons for this. Some state GTL mandates may allow a longer training frequency interval (e.g., every 5 years) [10], or apply to staff other than teachers—neither of which were captured by the current survey, which asks lead health education teachers about training in the past 2 years. It is also possible that, even when teachers are included in mandates, other local-level factors such as enforcement mechanisms or funding may influence successful implementation.

Gatekeeper training is well-recognized for enhancing participants' knowledge, attitudes, and confidence in suicide prevention [3]. However, evidence on its impact on intervention behaviors—such as making referrals to mental health services—and its ultimate effect on suicide rates remains limited. For example, while one systematic review found that gatekeeper training increased intervention behaviors [30], particularly in the short term, another did not [31]. The GLS Suicide Prevention Program includes gatekeeper training as a central component, with evaluation studies reporting reduced youth suicide rates in counties implementing the program [18,32]. In contrast, gatekeeper training in educational settings was not found to significantly reduce youth suicidality in a systematic review [33]. These mixed findings may reflect challenges in evaluating gatekeeper training, such as the confounding effect of gatekeeper trainings frequently being part of a broader suicide prevention program and the lack of long-term follow-up data on suicide outcomes.

Despite these uncertainties, GTLs have rapidly expanded nationwide over the past 2 decades, underscoring the need to understand their role in suicide prevention. Our study focused on the fidelity of GTL implementation as a critical first step in evaluating the impact of legal requirements for training on suicide outcomes and as a source of information for decision makers considering evidence-based tools to increase access to SPT. Future research could leverage the increased prevalence of gatekeeper trainings resulting from GTL mandates over the past 2 decades to evaluate their impact on reducing youth suicides.

Limitations

This research has several limitations. First, the specific scope of this study precludes conclusions about school-level results and the impact of GTLs on suicide outcomes. Second,

given that implementation of gatekeeper training may fluctuate and is more closely tied to the timing of the school year, the biennial timing of the SHP reports may lead to an underreport of training prevalence. Third, generalizability of results is limited as the outcome measure is specific to lead health education teachers. Fourth, the lead health education teachers were posed retrospective questions looking back 2 years, which may introduce recall bias into the prevalence estimates. Additionally, the model accounts for the presence of a GTL in a state at the end of the 2-year retrospective, indicating short-term intervention effect estimates may include some noise. For example, if a GTL was instituted just before a survey took place, it is possible some teachers may have received training within the survey question window prior to GTL institution which could overestimate short-term effects of the policy change. Conversely, some teachers may not have had enough follow-up time to receive the training post mandate which could underestimate the short term effect of the policy change. Fifth, this evaluation did not explore how the impacts of GTLs may vary based on specific components of the law, such as frequency of training or delivery methods. Nor did the evaluation explore retention of suicide prevention material or knowledge among trainees or information about the characteristics of schools that saw increases in training. The SHP data do not include detailed measures of the quality of SPT implemented in schools (e.g., the specific types of training teachers received or the proportion of staff trained). These factors may account for the effectiveness of GTLs in reducing suicide rates and warrant future investigation. Finally, the SHP reports included state-level representative data for just public secondary schools, thus results may not be generalizable to other types of secondary schools (e.g., private).

Conclusions

This study suggests that laws mandating SPT for school staff were effective at increasing the coverage of SPT for teachers. Training community members to identify and respond to people at risk of suicide is a key suicide prevention strategy [34]. Mandatory GTLs may serve as a viable tool to enhance the uptake and sustainability of school-based SPT efforts.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Disclaimer:

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

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IMPLICATIONS AND CONTRIBUTION

This study provides evidence that state gatekeeper training laws are effective at accomplishing their immediate aim of training more school staff in suicide prevention. These findings filled a gap in understanding the implementation fidelity of these laws, providing a crucial foundation for future evaluations of their impact on youth suicide.

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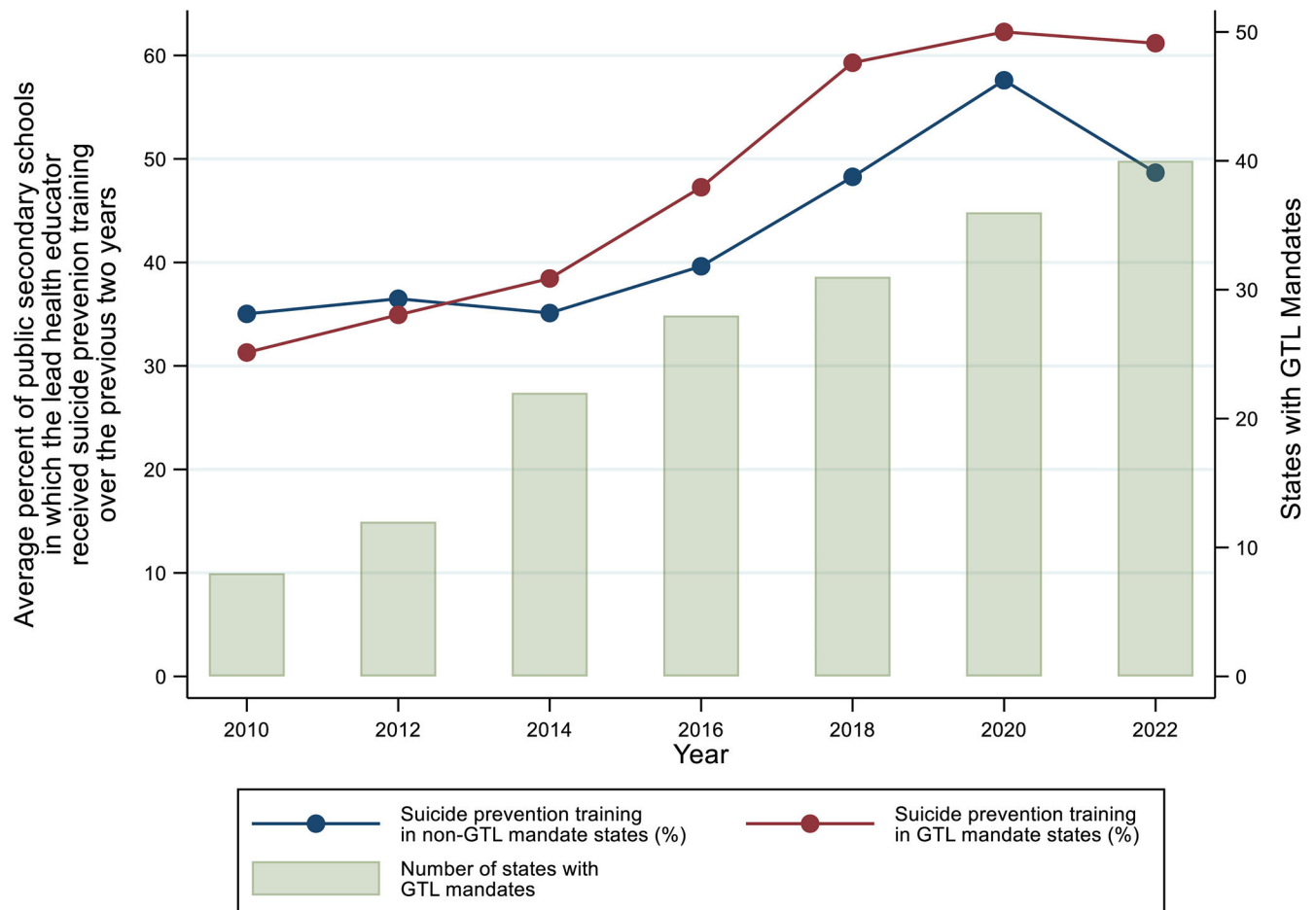


Figure 1.

Percent of public secondary schools in a state where the lead health teacher received professional development in suicide prevention in the previous 2 years by state gatekeeper training law mandate status, 2010–2022. Data Source: Legal data were collected from previous research [10]. GTL mandates were defined as laws that strictly mandated or conditionally mandated training. Strict mandates were defined as laws that required some or all school staff to be trained or included mechanisms to require training. Conditional mandates were defined as laws that appeared to mandate training but with conditions such that real-world implementation may not mandate training (e.g., mandatory training conditional on the availability of funding). Data on the percent of public secondary schools in a state in which the lead health education teacher received suicide prevention training during the previous 2 years were collected from CDC’s School Health Profiles reports. Statistical testing (*t*-tests) was conducted to test for differences in the trends over time, with relevant results reported and discussed in the manuscript text. For this figure, GTL mandate states include all states that instituted a GTL mandate ($n = 39$) over the study period. Suicide prevention training in non-GTL mandate states includes states that did not institute a GTL mandate ($n = 9$) over the study period. Data points at each time interval for suicide prevention training in GTL mandate states represents all mandate states regardless of whether that state had a mandate in effect at that specific time period.

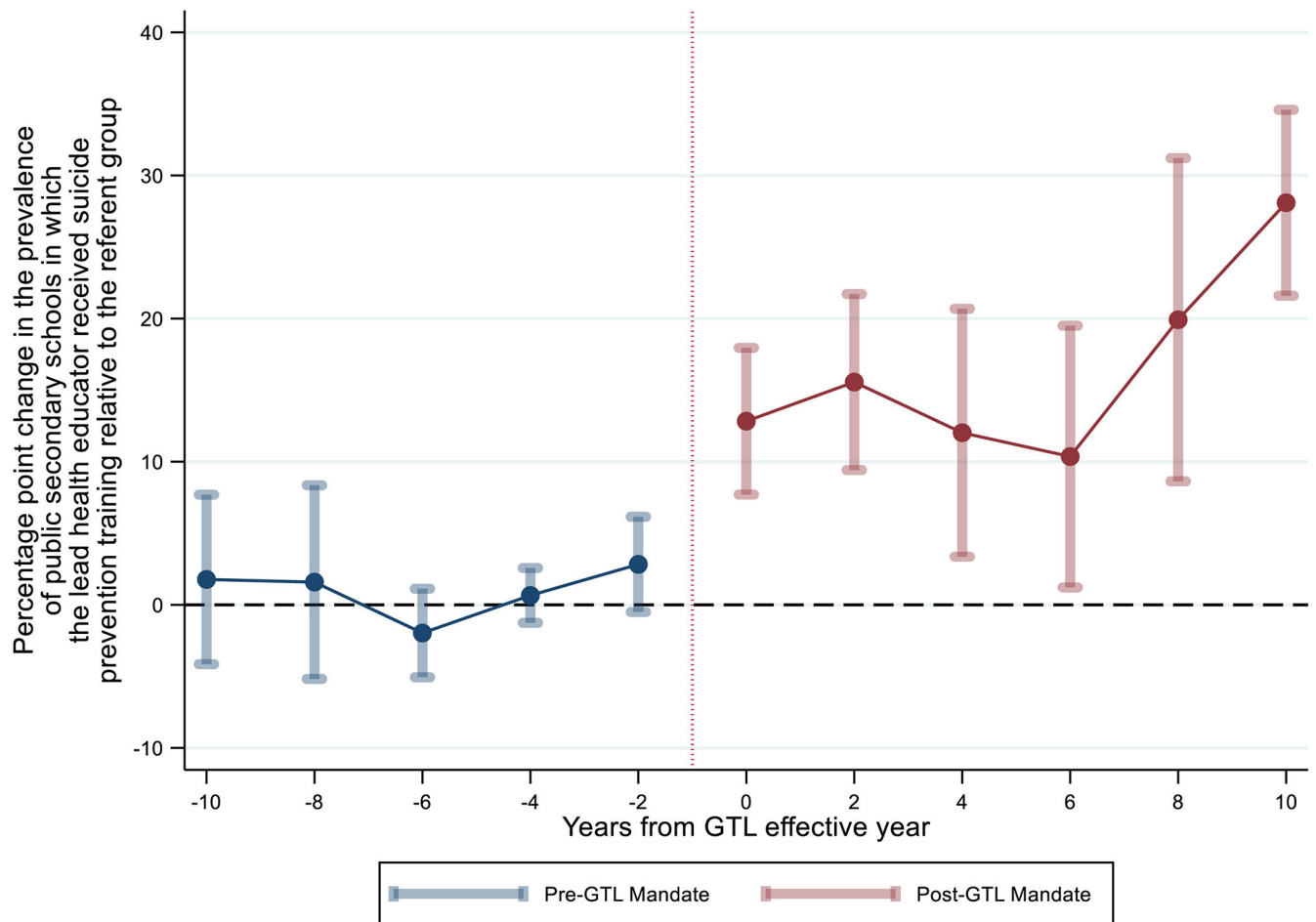


Figure 2.

Association between GTL mandates and percent of public secondary schools in a state where the lead health teacher received professional development in suicide prevention in the previous 2 years, Callaway and Sant'Anna Event Study results ($n = 246$ state-years), 2010—2022. Data Source: Legal data were collected from previous research [10]. GTL mandates were defined as laws that strictly mandated or conditionally mandated training. Strict mandates were defined as laws that required some or all school staff to be trained or included mechanisms to require training. Conditional mandates were defined as laws that appeared to mandate training but with conditions such that real-world implementation may not mandate training (e.g., mandatory training conditional on the availability of funding). Data on the percentage of public secondary schools in a state where the lead health education teacher received suicide prevention training in the previous 2 years were collected from CDC School Health Profiles reports. The figure reports coefficient estimates (and confidence intervals) from the event study specification. Coefficient estimates are interpreted as the percentage point change in the percentage of public secondary schools in a state where the lead health teacher received suicide prevention training in the previous 2 years attributed to the listed GTL. All models controlled for whether or not a state was funded

through the Garrett Lee Smith program, state fixed effects, and year fixed effects. Standard errors were clustered at the state level.

Table 1

Lead health education teachers surveyed and response rates from School Health Profiles survey samples used to produce representative state training prevalence estimates in the school health profile reports

State	Lead health education teachers surveyed (response rate %)						
	2010	2012	2014	2016	2018	2020 ^a	2022 ^a
Alabama	243 (71%)	239 (70%)	309 (74%)	304 (72%)	259 (71%)	161 (44%)	-
Alaska	185 (73%)	NA	194 (73%)	179 (75%)	181 (76%)	173 (73%)	96 (41%)
Arizona	297 (76%)	273 (71%)	287 (73%)	299 (72%)	-	173 (40%)	243 (57%)
Arkansas	230 (77%)	227 (76%)	208 (70%)	243 (79%)	NA	202 (72%)	171 (58%)
California	378 (77%)	355 (70%)	369 (73%)	380 (75%)	367 (73%)	-	264 (51%)
Colorado	NA	250 (72%)	NA	-	-	-	-
Connecticut	232 (72%)	-	230 (70%)	235 (72%)	-	231 (73%)	219 (72%)
Delaware	65 (77%)	65 (76%)	66 (75%)	70 (70%)	72 (71%)	51 (52%)	56 (56%)
Florida	361 (82%)	327 (71%)	319 (75%)	315 (74%)	319 (75%)	321 (76%)	-
Georgia	257 (71%)	311 (79%)	279 (72%)	288 (71%)	302 (73%)	79 (19%)	-
Hawaii	80 (71%)	84 (72%)	90 (77%)	94 (81%)	94 (79%)	93 (77%)	108 (89%)
Idaho	249 (73%)	190 (71%)	181 (72%)	184 (72%)	182 (70%)	154 (58%)	107 (40%)
Illinois	-	-	335 (73%)	331 (73%)	323 (71%)	300 (71%)	269 (60%)
Indiana	299 (71%)	263 (71%)	295 (71%)	260 (70%)	-	259 (70%)	275 (75%)
Iowa	249 (72%)	257 (75%)	256 (72%)	-	-	265 (77%)	250 (72%)
Kansas	267 (73%)	243 (71%)	295 (70%)	249 (71%)	248 (72%)	197 (57%)	174 (49%)
Kentucky	264 (74%)	247 (74%)	234 (72%)	245 (74%)	236 (72%)	235 (71%)	238 (72%)
Louisiana	225 (72%)	-	-	265 (72%)	-	140 (38%)	197 (53%)
Maine	241 (74%)	241 (81%)	224 (77%)	233 (80%)	214 (75%)	216 (74%)	204 (70%)
Maryland	233 (71%)	249 (73%)	273 (81%)	254 (74%)	269 (76%)	258 (76%)	239 (71%)
Massachusetts	625 (82%)	642 (85%)	660 (85%)	649 (84%)	581 (75%)	605 (78%)	501 (64%)
Michigan	302 (75%)	318 (78%)	308 (78%)	305 (76%)	293 (73%)	288 (71%)	279 (71%)
Minnesota	301 (72%)	280 (79%)	282 (79%)	258 (72%)	306 (86%)	256 (76%)	254 (77%)
Mississippi	205 (71%)	227 (73%)	221 (71%)	222 (72%)	222 (72%)	203 (72%)	227 (80%)
Missouri	302 (77%)	306 (78%)	295 (76%)	283 (74%)	313 (80%)	258 (71%)	310 (75%)
Montana	209 (72%)	242 (83%)	242 (84%)	246 (88%)	227 (82%)	211 (76%)	248 (83%)
Nebraska	212 (73%)	219 (74%)	233 (78%)	218 (73%)	216 (73%)	214 (73%)	166 (57%)

State	Lead health education teachers surveyed (response rate %)						
	2010	2012	2014	2016	2018	2020 ^a	2022 ^a
Nevada	131 (73%)	133 (71%)	133 (73%)	143 (73%)	NA	142 (70%)	133 (65%)
New Hampshire	183 (86%)	179 (84%)	173 (80%)	177 (82%)	165 (77%)	173 (80%)	245 (99%)
New Jersey	306 (72%)	297 (70%)	300 (71%)	306 (72%)	305 (72%)	-	141 (33%)
New Mexico	NA	200 (72%)	-	242 (82%)	215 (74%)	222 (76%)	213 (72%)
New York	677 (73%)	-	362 (73%)	399 (81%)	349 (71%)	327 (66%)	212 (44%)
North Carolina	338 (79%)	302 (70%)	232 (73%)	324 (74%)	322 (73%)	202 (46%)	149 (83%)
Ohio	335 (73%)	341 (71%)	336 (73%)	329 (71%)	325 (71%)	327 (70%)	318 (71%)
Oklahoma	315 (74%)	306 (72%)	NA	NA	NA	115 (27%)	108 (25%)
Oregon	270 (70%)	283 (71%)	287 (71%)	298 (72%)	264 (73%)	174 (49%)	176 (49%)
Pennsylvania	327 (71%)	328 (72%)	364 (83%)	297 (75%)	292 (73%)	297 (74%)	297 (74%)
Rhode Island	95 (85%)	89 (79%)	101 (89%)	101 (85%)	97 (81%)	97 (78%)	93 (75%)
South Carolina	342 (76%)	249 (76%)	265 (81%)	269 (82%)	201 (72%)	190 (60%)	75 (24%)
South Dakota	189 (72%)	188 (71%)	165 (72%)	165 (73%)	169 (73%)	-	-
Tennessee	285 (78%)	287 (78%)	324 (83%)	364 (94%)	370 (94%)	285 (83%)	299 (87%)
Texas	384 (75%)	-	NA	NA	NA	375 (73%)	361 (70%)
Utah	189 (73%)	189 (73%)	202 (77%)	204 (76%)	193 (72%)	117 (43%)	140 (52%)
Vermont	116 (76%)	115 (75%)	126 (81%)	134 (89%)	126 (84%)	119 (82%)	135 (93%)
Virginia	359 (86%)	300 (71%)	265 (70%)	254 (77%)	279 (74%)	162 (43%)	184 (49%)
Washington	217 (72%)	NA	281 (74%)	273 (72%)	272 (72%)	155 (39%)	225 (57%)
Wisconsin	385 (83%)	318 (76%)	308 (74%)	308 (73%)	358 (84%)	-	303 (71%)
Wyoming	115 (75%)	123 (79%)	110 (71%)	130 (82%)	-	-	-

- Indicates the survey was not administered.

NA indicates that representative state-level estimates were not able to be estimated, given the survey data collected.

^a Prior to 2020, only data from sites with response rates of 70% or greater were weighted (accounting for nonresponse) and used to produce data representative of all public secondary schools in each jurisdiction. Starting in 2020, nonresponse bias analyses were conducted for sites with response rates below 70% as response rates were impacted by the COVID-19 pandemic. Thus, data from sites with response rates below 70% were also weighted to produce data representative of all public secondary schools in each jurisdiction. For more information regarding the nonresponse bias analyses and weighting, please see the 2020 school health profiles report (Centers for Disease Control and Prevention. School Health Profiles 2020: Characteristics of health programs among secondary schools. Atlanta: Centers for Disease Control and Prevention; 2022).

Source: The number of lead health educators surveyed and response rates were collected from each School Health Profile survey report.

Table 2

Association between state gatekeeper training laws and percent of public secondary schools in a state where the lead health teacher received professional development in suicide prevention in the previous 2 years, 2010–2022

Policy	Difference-in-difference coefficient estimates (95% confidence intervals)		
	Two-way fixed effects difference-in-difference	Callaway and Sant'Anna difference-in-difference (not yet treated) ^b	Callaway and Sant'Anna difference-in-difference (never treated) ^b
GTL mandate	15.2 *** (10.9, 19.5)	13.7 *** (7.7, 19.8)	14.3 *** (8.1, 20.5)
GTL strict mandate ^a	11.4 *** (5.8, 17.0)	10.2 *** (3.1, 17.3)	10.4 *** (3.2, 17.6)

Legal data were collected from previous research [10]. GTL mandates were defined as laws that strictly mandated or conditionally mandated training. Strict mandates were defined as laws that required some or all school staff to be trained or included mechanisms to require training. Conditional mandates were defined as laws that appeared to mandate training but with conditions such that real world implementation may not mandate training (e.g., mandatory training conditional on availability of funding).

Data on the % of public secondary schools in a state where the lead health teacher received suicide prevention training in the previous 2 years were collected from CDC School Health Profiles reports. The table reports coefficient estimates (and confidence intervals) representing the average treatment effect on the treated. Coefficient estimates are interpreted as the percentage point change in the percentage of public secondary schools in a state where the lead health teacher received suicide prevention training in the previous 2 years attributed to the listed GTL. All models controlled for whether a state was funded through the Garrett Lee Smith program, state fixed effects, and year fixed effects. Standard errors were clustered at the state level.

CDC = Centers for Disease Control and Prevention; DID = difference-in-difference; GTL = gatekeeper training law.

* Indicates $p < .05$.

** Indicates $p < .01$.

*** Indicates $p < .001$.

^aThis row provides results from a sensitivity analysis evaluating strict GTL mandates (i.e., including conditional mandate states in the control group).

^bIn the Callaway and Sant'Anna DID (not yet treated) analysis, the control group consists of states that never instituted a GTL mandate and states that have yet to institute a GTL mandate for the years prior to the mandate's effective date. For the Callaway and Sant'Anna DID (never treated), the control group consists of just states that never instituted GTL mandates over the study period.

Table 3

Association between state gatekeeper training laws and percent of public secondary schools in a state where the lead health education teacher received professional development for other health topics in the previous 2 years, by health topic, 2010–2022

Health topic	Outcome: Percentage of public secondary schools in which the lead health education teacher received professional development during the two years before the survey on other specific health topics	Two-way fixed effects difference-in-difference	Callaway and Sant'Anna difference-in-difference (not yet treated)	Callaway and Sant'Anna difference-in-difference (never treated)
Nutrition and dietary behavior	GTL mandate	– 0.4 (– 2.5, 1.7)	0.9 (– 1.7, 3.4)	1.4 (– 1.1, 3.9)
	GTL strict mandate	– 0.4 (– 2.8, 2.0)	– 0.04 (– 2.7, 2.6)	0.2 (– 2.6, 2.9)
Physical activity and fitness	GTL mandate	– 0.4 (– 2.4, 1.6)	0.2 (– 2.6, 3.0)	0.5 (– 2.2, 3.3)
	GTL strict mandate	0.7 (– 1.6, 2.9)	1.1 (– 2.1, 4.3)	1.4 (– 2.1, 4.8)
Pregnancy prevention	GTL mandate	0.5 (– 2.1, 3.2)	0.9 (– 2.2, 4.0)	0.5 (– 3.1, 4.1)
	GTL strict mandate	1.5 (– 1.3, 4.3)	1.5 (– 1.6, 4.6)	1.5 (– 1.8, 4.8)
STD prevention	GTL mandate	0.6 (– 2.3, 3.4)	0.6 (– 2.9, 4.1)	0.3 (– 3.8, 4.3)
	GTL strict mandate	2.0 (– 1.2, 5.1)	1.8 (– 1.7, 5.2)	1.9 (– 1.8, 5.6)

Data source: Legal data were collected from previous research [10]. GTL mandates were defined as laws that strictly mandated or conditionally mandated training. Strict mandates were defined as laws that required some or all school staff to be trained or included mechanisms to require training. Conditional mandates were defined as laws that appeared to mandate training but with conditions such that real world implementation may not mandate training (e.g., mandatory training conditional on availability of funding). Data on the percentage of public secondary schools in a state where the lead health education teacher received training on the specified health topic in the previous 2 years were collected from the School Health Profiles reports.

The table reports coefficient estimates (and confidence intervals) representing the percentage point change in the outcome attributed to the policy change (i.e., the average treatment effect on the treated). All models controlled for whether a state was funded through the Garrett Lee Smith program, state fixed effects, and year fixed effects. Standard errors were clustered at the state level.

* indicates $p < .05$,

** indicates $p < .01$, and

*** indicates $p < .001$ (None of the coefficient estimates were statistically significant in this analysis).

GTL = gatekeeper training law; STD = sexually transmitted disease.