Website Survey Method for Assessing Higher Education Employee Health and Safety Programs

Maayan S. Malomet, BA and Philip Harber, MD, MPH

Objective: The higher education industry in the United States is large (almost four million employees and 19 million students) with diverse hazards. **Methods:** We apply a novel health services research approach to systematically assess a sample of 55 institutional websites. The accessibility, content, and coverage of occupational health/safety program information were systematically coded for several domains (eg, Occupational Safety and Health Administration (OSHA)-related, specific hazards, clinical, person-oriented, COVID-19, and coverage). **Results:** Information was more available for programs related to OSHA mandates (eg, chemical hygiene) and specific hazards than for person-oriented programs (eg, counseling). Larger institutions provide better information and more comprehensive programs than smaller institutions. **Conclusions:** Higher education institutions warrant increasing attention to occupational health and safety, particularly as COVID-19 increased attention to workplace health issues.

Keywords: COVID-19, health services research, occupational safety and health, postsecondary education, web methods

Educational institutions in the United States constitute a large employer group. In 2017, almost four million persons were employed by postsecondary education institutions in the United States, including 1.5 million faculty, 0.4 million graduate assistants, and 2 million other staff.[1] The employees include faculty members, support staff, and research team members. The worker population includes many jobs unique to the educational/research industry as well as many job roles that are present in many other industries. Furthermore, experiences during college and university years shaped the behavior and beliefs of students during their subsequent work lives. Despite the significant importance, the health and safety of educational institution employees have received disproportionately little research or public health interest.

The industry is diverse, ranging from small liberal arts colleges to large multicampus research institutions. Some focus primarily on undergraduate education, whereas others have diverse research programs as well. A significant proportion also provides direct service, such as operating increasingly large healthcare systems. Even small liberal arts colleges have diverse and significant occupational health challenges. For example, they have departments in theater arts with concomitant occupational hazards; many are engaged in extensive international activities through study abroad programs and global field research around the world.

Assessing occupational health and safety programs is particularly challenging in a diverse industry such as postsecondary education and research. Direct surveys of employees (faculty and staff members) are extremely resource-intensive and potentially misleading if limited to only a few institutions. Outcome data such as workers' compensation claims or Occupational Safety and Health Administration (OSHA) log recorded cases are not systematically available and particularly likely to be underestimated. Institutional websites provide information about programs and policies. We, therefore, conducted a systematic analysis of a diverse sample of postsecondary educational institution websites to provide descriptive information about the structure of employee health and safety programs. Effective communication of programs' characteristics is an essential component for their success, and we therefore also evaluated the ease of accessing such information. Occupational health research has increasingly used web-based methods to collect data from individual respondents. This study explores an additional approach to acquiring web-based information.

This work is particularly timely: the COVID-19 pandemic has markedly raised awareness of occupational health concerns in colleges and universities since many staff and faculty members now voice active concern about the safety of their normal on-campus activities.[2,3]

METHODS

Fifty-five US colleges and universities were included in the study. The convenience sample was chosen to include institutions with varied characteristics for the following factors: ownership (private or public); size (large or small [less than 5000]); location (urban, suburban, or rural); and student body type (undergraduate or combined undergraduate/graduate). In addition, the presence or absence of a medical school was considered an important characteristic since this affects the availability of resources for health services as well as the characteristics of the worker population. Several sources of descriptive information were used to guide sample selection by providing descriptive information not otherwise available.[4,5] No institutions selected initially were excluded subsequently.

An initial list of potential topics of interest was developed on an a priori basis. Components for abstraction were selected based on the following criteria: relevance, the feasibility of identification, and ability to code consistently. Several institutional websites were explored to assess the feasibility of collecting meaningful data and to determine if additional topics should be ascertained. Next, a codebook and abstract form were created and tested. Several modifications were made to balance specificity with limiting the number of fields and response codes. The general categories of information abstracted are summarized in Table 1. The table also describes the coding scheme. We also collected anecdotal examples of information. The relevant URLs were also incorporated.

Data collection occurred in July and August 2020. Each website was reviewed and scored by the first author (M.M.), with periodic review and consensus coding by the second author (P.H.). Data were managed in Microsoft Excel (Redmond, WA).

For each institution, an initial search was conducted using Google. Institutional descriptive information was obtained using queries representing a topic of interest. The typical format of the query was "Institution Name" AND "Query Domain" such as "College Name" AND "Medical Center."

From the Muhlenberg College, Allentown, Pennsylvania (Ms Malomet); Mel and Enid Zuckerman College of Public Health, University of Arizona, Tucson, Arizona (Dr Harber).

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Clinical significance: Colleges and universities are diverse in size and scope of activities, yet all have significant potential occupational hazards. In addition to the impact on the almost four million faculty and staff employees, Occupational Health & Safety affects the much larger number of students. This report explores the range of information about institutional health and safety programs available on websites.

Address correspondence to: Philip Harber, MD, MPH, University of Arizona, 1656 E Mabel St, Rm 112, Tucson, AZ 85724 (pharber@arizona.edu).

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TABLE 1. Elements Abstracted

Domain	Purpose	Example	Code Structure
Institutional characteristics	Describe the institution.	Private/public ownership, medical school	Coded based on presence or absence of characteristic
OSHA related	Is information about specific programs easily ascertained on the website?	Chemical hygiene	Easy, accessible, special, restricted, absent unknown (see Methods)
Specific hazard programs	Availability of information	Blood-borne pathogens, TB program	Easy, accessible, special, restricted, absent unknown
Clinical services, not typically OSHA mandated	Specific clinical services	First-aid; physical/occupational therapy	Easy, accessible, special, restricted, absent unknown
Person oriented	Availability of information	Employee wellness	Easy, accessible, special, restricted, absent unknown
SARS-CoV-2 related	Web pages specific to pandemic related problems; illustrates responsiveness to evolving needs	COVID-19 related counseling service	Yes, No, limited, unknown
Workers compensation	Workers compensation specific web information	Clarity of how to file	Description of where to report or numerical estimate of clarity
Coverage/accessibility of services	Who is eligible to receive the service?	Access to hepatitis B services	Students only, employees only, unknown

Information about available services was coded based upon structured searches using queries such as: ''Institution Name'' AND ''Service Term,'' where service term represents a topic of interest (eg, ''College Name'' AND ''Hepatitis B''). The information about the presence of information and its ease of access were classified into several ordinal categories as seen in Table 1. ''Easy'' was coded when the program information (eg, ''Hepatitis B'') was found in fewer than three clicks, ''Accessible'' if it required three to seven clicks, ''Special'' or ''Restricted'' if the program details were not accessible but had an available link, ''Unknown'' when the information was extremely unclear, and ''Absent'' was coded when the information could not be found.

Access to several services and programs (Coverage) was also abstracted for relevant services. Categories include ''Employees only,'' ''Students only,'' and ''All.'' ''Unknown'' was coded when there was a lack of clarity about coverage.

Occupational health clinics: Occupational health clinics associated with the institution descriptions were coded. ''Campus'' refers to occupational health clinics on campus. ''Medical Campus'' refers to occupational health clinics on medical campuses. ''Not Campus'' refers to clinics associated with the institution but not on campus. ''Unknown'' refers to the unknown location of the occupational health clinic. For each institution with an occupational health clinic, the ''Director Name'' and ''Director Degree'' were coded; ''Unknown'' was coded if the information was not found or if there was not a clear distinction of staff or director positions. For institutions without occupational health clinics ''X'' was coded. Whether or not an institution website showed psychologists associated with their occupational health clinic was coded as ''Yes'' or ''No.'' Similar codes were used for trained physical therapists and occupational therapists. The number of ''Nurses'' was coded for the number of nurses in the occupational health clinic, for clinics without nurses, ''X'' was coded.

Respirator programs: Information about coverage, respirator selection/training, and fit testing were coded using comparable scales.

COVID-19: Data collection occurred during the COVID-19 pandemic. Therefore, we collected information about the institutional occupational/employee health resources by examining whether specific webpages or services were identifiable during the time of data collection.

Information concerning the workers' compensation programs was identified focusing on two aspects—where to file a report and the overall estimate of clarity.

Analysis: Analyses were conducted using Microsoft Excel and Microsoft Access. Summary frequencies were based upon three groups of institutions—large with medical school, large without a medical school, small. The percentage for each code category within the groups is determined.

The analyses of individual elements are descriptive to characterize the quality of web-based information across a wide range of areas. In addition, ratings were aggregated into two categories—''Good'' and ''Suboptimal,'' and large institutions with and without medical schools were aggregated. Results of chi-square testing (large/small vs good/suboptimal) are reported where the minimum expected cell frequency is at least five.

Domain analyses: For each of the major domains (collections of related components) shown in Table 1, the total numbers of good and suboptimal ratings were summed according to large versus small institutional categories. The distribution was assessed by chi-square analysis. Comparison of large and small institutions for good versus suboptimal web information access was conducted with chi-square testing, combining results for large institutions with and without medical schools.

To facilitate comparisons, an aggregate index for each of the domain-institutional size combinations, a summary rating was determined by assigning 1 to ''Good'' and 0 to ''Suboptimal'' ratings, then averaging the ratings for all items in a domain for large and small institutions.

RESULTS

The characteristics of the institutions in the sample are described in Table 2. The data sample includes a good mix, representing the major characteristic factors. However, there were no small colleges with medical schools as might be anticipated.

Program elements and ease of accessing information for specific services are summarized in Table 3. Results are shown stratified by three combinations of institutional size and the presence/absence of a medical school. Several programmatic areas had information that was easily accessible in most institutions. These include hazard communication, chemical hygiene, safety reports.

TABLE 2. Institutions Sampled

Private/Public	Size	Location	Enrollment	Medical School	*n*
Private	Large	Suburban	Graduate	N	3
	Large	Suburban	Graduate	Y	2
	Large	Urban	Graduate	N	2
	Large	Urban	Graduate	Y	11
	Small	Rural	Graduate	N	2
	Small	Rural	Undergraduate	N	8
	Small	Suburban	Undergraduate	N	3
	Small	Urban	Undergraduate	N	5
Public	Large	Rural	Graduate	N	1
	Large	Rural	Graduate	Y	2
	Large	Urban	Graduate	N	2
	Large	Urban	Graduate	Y	14
				Total	55

Enrollment	Size	*N*
Graduate	Large	37
Graduate	Small	2
Undergraduate	Small	16

Location	Size	*N*
Rural	Large	3
Rural	Small	10
Suburban	Large	5
Suburban	Small	3
Urban	Large	29

Conversely, asbestos, and hearing conservation programs were often absent, particularly at smaller institutions. For example, hearing conservation was present in 33 of 37 large but only 5 of 18 small institutions.

Occupational health clinic and services information was often unavailable or inadequately described at small institutions but generally present in larger institutions; the occupational health clinic site was identifiable in 23 of the 37 large institutions but none of the small ones. Identification and qualifications of staff members of the clinics were rarely identifiable from websites (eg, the director name was easily found in only seven institutions).

The presence of person-oriented and clinical services varied considerably. Employee wellness and stress management programs were identifiably present in most of the large institutions, particularly if they were associated with a medical school (differences according to the institutional group had $P < 0.05$ for both). Psychology services were often absent, particularly in smaller institutions.

Information about COVID-19 was nearly always available and easily accessible (36/37 large and 18/18 small institutions). The information provided by institutions varied in the degree of specificity, especially in the presence of explicit stay home policies that varied in both large and small institutions.

Coverage results are shown in Table 4. To the extent discernible from the websites, this demonstrates considerable variance of availability of services to employees in comparison to students. Most institutions placed emphasis and availability for several services that differed for students and employees. Travel health and Americans with Disabilities Act (ADA) information focused predominantly on students rather than employees.

Workers' compensation programs are generally found easily accessible among institutions. Human Resources is the primary contact for nearly all workers' compensation programs for which explicit data are available (39 of 48 where specified). The process is moderately clearly defined in most institutions, for which 42/51 ratable websites scored is more than or equal to four.

Figure 1 summarizes the adjusted domain aggregate scores. As may be seen, large institutions generally provided more comprehensive services than did smaller ones.

DISCUSSION

This study supports the utility of the classification of institutional employee occupational health websites as a methodologic health services research tool. This novel method complements other approaches for gaining an understanding of this industry's employee health practices. It does not depend upon recruiting a large number of participants, nor is it limited by reliance on traditional workers' compensation or OSHA case reports for assessing programs. As an efficient, low-cost method, it could be applied to a large enough sample of institutions to provide insights across this diverse, highly varied industry. It was therefore particularly useful in the scoping phase of developing a broad approach to health and safety.

This study examined the accessibility and quality of institutional website employee occupational health and safety resources at institutions across the United States. Postsecondary (''higher'') education is a large industry in the United States.[1,6,7] In the United States, 19.8 million students, including 16.6 million undergraduates, are enrolled in these institutions.[6,7] Observing the quality of occupational health and safety activities may influence the expectations of students as they move forward in their subsequent careers.[8] Despite this significance, there has been little attention to occupational health and safety programs, other than aspects related to outward-facing clinical services provided by large university medical centers.

The COVID-19 pandemic has raised awareness of the potential for developing work-related illness and injury in this industry.[9] It is therefore an opportune time to carefully consider the health and safety of workers. While most other hazards such as chemical

TABLE 3. Ease of Web Information Access

		Ease of Information Access						Composite Assessment by Size			
	Group	Easy	Accessible	Restricted/ Special	Difficult	Absent	Unknown	Size	Good	Suboptimal	*P*
OSHA related											
Hepatitis B	L_MS−	7 (88%)	1 (13%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	Large	37	0	
	S	12 (67%)	1 (6%)	3 (17%)	0 (0%)	1 (6%)	1 (6%)	Small	13	5	
	L_MS+	20 (69%)	9 (31%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)				
Respirator (Selection & Training)	L_MS−	6 (75%)	0 (0%)	1 (13%)	0 (0%)	1 (13%)	0 (0%)	Large	34	3	
	S	6 (33%)	2 (11%)	1 (6%)	0 (0%)	9 (50%)	0 (0%)	Small	8	10	
	L_MS+	27 (93%)	1 (3%)	1 (3%)	0 (0%)	0 (0%)	0 (0%)				
Respirator fit testing	L_MS−	5 (63%)	0 (0%)	0 (0%)	0 (0%)	2 (25%)	1 (13%)	Large	34	3	
	S	8 (44%)	3 (17%)	0 (0%)	0 (0%)	7 (39%)	0 (0%)	Small	11	7	
	L_MS+	27 (93%)	2 (7%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)				
Asbestos	L_MS−	7 (88%)	0 (0%)	1 (13%)	0 (0%)	0 (0%)	0 (0%)	Large	36	1	
	S	8 (44%)	0 (0%)	2 (11%)	0 (0%)	8 (44%)	0 (0%)	Small	8	10	
	L_MS+	27 (93%)	2 (7%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)				
Hazard communication	L_MS−	7 (88%)	0 (0%)	0 (0%)	1 (13%)	0 (0%)	0 (0%)	Large	34	3	
	S	13 (72%)	0 (0%)	1 (6%)	1 (6%)	3 (17%)	0 (0%)	Small	13	5	
	L_MS+	26 (90%)	1 (3%)	1 (3%)	0 (0%)	1 (3%)	0 (0%)				
Bloodborne pathogens	L_MS−	8 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	Large	35	2	
	S	12 (67%)	0 (0%)	2 (11%)	0 (0%)	4 (22%)	0 (0%)	Small	12	6	
	L_MS+	27 (93%)	0 (0%)	2 (7%)	0 (0%)	0 (0%)	0 (0%)				
Chemical hygiene	L_MS−	7 (88%)	0 (0%)	0 (0%)	0 (0%)	1 (13%)	0 (0%)	Large	36	1	
	S	15 (83%)	1 (6%)	0 (0%)	0 (0%)	2 (11%)	0 (0%)	Small	16	2	
	L_MS+	29 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)				
Hearing conservation	L_MS−	5 (63%)	0 (0%)	0 (0%)	0 (0%)	3 (38%)	0 (0%)	Large	29	8	**
	S	5 (28%)	0 (0%)	0 (0%)	0 (0%)	13 (72%)	0 (0%)	Small	5	13	
	L_MS+	23 (79%)	1 (3%)	1 (3%)	0 (0%)	1 (3%)	3 (10%)				
Specific hazard programs	L_MS−	8 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	Large	37	0	
Organization safety report	S	17 (94%)	0 (0%)	0 (0%)	0 (0%)	1 (6%)	0 (0%)	Small	17	1	
	L_MS+	29 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)				
Bloodborne pathogens program*	L_MS−	8 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	Large	37	0	
	S	14 (78%)	0 (0%)	0 (0%)	0 (0%)	3 (17%)	1 (6%)	Small	14	4	
	L_MS+	29 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)				
BioSafety	L_MS−	7 (88%)	0 (0%)	1 (13%)	0 (0%)	0 (0%)	0 (0%)	Large	36	1	
	S	9 (50%)	0 (0%)	3 (17%)	0 (0%)	6 (33%)	0 (0%)	Small	9	9	
	L_MS+	29 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)				
Radiation safety	L_MS−	8 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	Large	36	0	
	S	12 (67%)	0 (0%)	3 (17%)	0 (0%)	3 (17%)	0 (0%)	Small	12	6	
	L_MS+	28 (97%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)				
Biosafety Comm (IBC)	L_MS−	6 (75%)	1 (13%)	0 (0%)	0 (0%)	1 (13%)	0 (0%)	Large	36	1	
	S	11 (61%)	0 (0%)	0 (0%)	0 (0%)	3 (17%)	4 (22%)	Small	11	7	
	L_MS+	26 (90%)	3 (10%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)				
Clinical programs	L_MS−	6 (75%)	0 (0%)	0 (0%)	0 (0%)	2 (25%)	0 (0%)	Large	31	6	
TB program	S	13 (72%)	0 (0%)	0 (0%)	0 (0%)	4 (22%)	1 (6%)	Small	13	5	
	L_MS+	21 (72%)	4 (14%)	0 (0%)	0 (0%)	3 (10%)	1 (3%)				
First Aid/EMS on Campus	L_MS−	6 (75%)	1 (13%)	0 (0%)	0 (0%)	1 (13%)	0 (0%)	Large	36	1	
	S	16 (89%)	1 (6%)	0 (0%)	0 (0%)	1 (6%)	0 (0%)	Small	17	1	
	L_MS+	28 (97%)	1 (3%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)				
Injury care	L_MS−	5 (63%)	2 (25%)	0 (0%)	0 (0%)	1 (13%)	0 (0%)	Large	30	7	*
	S	8 (44%)	1 (6%)	2 (11%)	0 (0%)	6 (33%)	1 (6%)	Small	9	9	
	L_MS+	16 (55%)	7 (24%)	1 (3%)	0 (0%)	2 (7%)	3 (10%)				
PT/OT	L_MS−	3 (38%)	1 (13%)	0 (0%)	0 (0%)	3 (38%)	1 (13%)	Large	24	13	ns
	S	5 (28%)	0 (0%)	0 (0%)	0 (0%)	13 (72%)	0 (0%)	Small	5	13	
	L_MS+	10 (34%)	10 (34%)	0 (0%)	0 (0%)	6 (21%)	3 (10%)				
Travel Health	L_MS−	8 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	Large	37	0	
	S	13 (72%)	2 (11%)	0 (0%)	0 (0%)	3 (17%)	0 (0%)	Small	15	3	
	L_MS+	29 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)				
Person-oriented Ergonomics	L_MS−	7 (88%)	0 (0%)	0 (0%)	0 (0%)	1 (13%)	0 (0%)	Large	35	2	
	S	11 (61%)	0 (0%)	0 (0%)	2 (11%)	5 (28%)	0 (0%)	Small	11	7	
	L_MS+	25 (86%)	3 (10%)	0 (0%)	0 (0%)	1 (3%)	0 (0%)				
Wellness (Employee)	L_MS−	8 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	Large	37	0	
	S	13 (72%)	2 (11%)	0 (0%)	0 (0%)	3 (17%)	0 (0%)	Small	15	3	
	L_MS+	27 (93%)	2 (7%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)				

TABLE 3. (*Continued*)

		Ease of Information Access						Composite Assessment by Size			
	Group	Easy	Accessible	Restricted/ Special	Difficult	Absent	Unknown	Size	Good	Suboptimal	*P*
Stress Management	L_MS−	8 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	Large	35	2	
	S	10 (56%)	0 (0%)	3 (17%)	0 (0%)	5 (28%)	0 (0%)	Small	10	8	
	L_MS+	20 (69%)	7 (24%)	1 (3%)	0 (0%)	0 (0%)	1 (3%)				
Psychology Services (Employee)	L_MS−	2 (25%)	2 (25%)	0 (0%)	0 (0%)	4 (50%)	0 (0%)	Large	24	13	ns
	S	2 (11%)	1 (6%)	0 (0%)	0 (0%)	15 (83%)	0 (0%)	Small	3	15	
	L_MS+	19 (66%)	1 (3%)	1 (3%)	0 (0%)	3 (10%)	5 (17%)				
ADA	L_MS−	8 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	Large	37	0	
	S	17 (94%)	0 (0%)	0 (0%)	0 (0%)	1 (6%)	0 (0%)	Small	17	1	
	L_MS+	29 (100%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)				
SARS-CoV-2 information		Yes	Limited	None							
SARS-CoV-2 page	L_MS−	7 (88%)	0 (0%)	1 (13%)				Large	36	1	*
	S	18 (100%)	0 (0%)	0 (0%)				Small	18	0	
	L_MS+	29 (100%)	0 (0%)	0 (0%)							
Counseling Resources (COVID-19)	L_MS−	7 (88%)	0 (0%)	1 (13%)				Large	36	1	
	S	16 (89%)	0 (0%)	2 (11%)				Small	16	2	
	L_MS+	29 (100%)	0 (0%)	0 (0%)							
Stay Home Policy (COVID-19)	L_MS−	2 (25%)	4 (50%)	2 (25%)				Large	30	7	
	S	5 (28%)	7 (39%)	6 (33%)				Small	12	6	
	L_MS+	14 (48%)	10 (34%)	5 (17%)							

ADA, Americans with Disabilities Act.

The table summarizes availability of web information for each of the program elements shown. The categories are described in Methods and Table 1. Institutions are grouped by size (L = large, S = small) and the presence or absence of a medical school (MS+ and MS− respectively). *P* values were calculated only for elements for which the minimum cell size was at least five (ns indicates not significant).

*$P < 0.01$.

**$P < 0.001$.

TABLE 4. Information About Coverage

	Group	All	Employees	Students	Absent/Unknown
Hepatitis B	L_MS−	10 (34%)	5 (17%)	13 (45%)	1 (3%)
	Small	2 (25%)	3 (38%)	3 (38%)	0 (0%)
	L_MS+	6 (33%)	4 (22%)	6 (33%)	2 (11%)
TB	L_MS−	2 (7%)	3 (10%)	17 (59%)	7 (24%)
	Small	0 (0%)	0 (0%)	6 (75%)	2 (25%)
	L_MS+	0 (0%)	0 (0%)	13 (72%)	5 (28%)
Blood borne pathogens	L_MS−	8 (28%)	20 (69%)	0 (0%)	1 (3%)
	Small	1 (13%)	7 (88%)	0 (0%)	0 (0%)
	L_MS+	2 (11%)	11 (61%)	0 (0%)	5 (28%)
First aid	L_MS−	7 (24%)	3 (10%)	10 (34%)	9 (31%)
	Small	1 (13%)	0 (0%)	3 (38%)	4 (50%)
	L_MS+	0 (0%)	0 (0%)	16 (89%)	2 (11%)
Injury care	L_MS−	2 (7%)	17 (59%)	3 (10%)	7 (24%)
	Small	0 (0%)	7 (88%)	0 (0%)	1 (13%)
	L_MS+	2 (11%)	3 (17%)	4 (22%)	9 (50%)
PT/OT	L_MS−	6 (21%)	4 (14%)	9 (31%)	10 (34%)
	Small	0 (0%)	2 (25%)	1 (13%)	5 (63%)
	L_MS+	1 (6%)	0 (0%)	4 (22%)	13 (72%)
Respirator fit testing	L_MS−	8 (28%)	19 (66%)	0 (0%)	2 (7%)
	Small	2 (25%)	5 (63%)	0 (0%)	1 (13%)
	L_MS+	1 (6%)	10 (56%)	0 (0%)	7 (39%)

PT/OT, physical/occupational therapy; TB, tuberculosis.

The table summarizes ease of access for information about coverage (eligibility). Group codes are same as in Table 3.

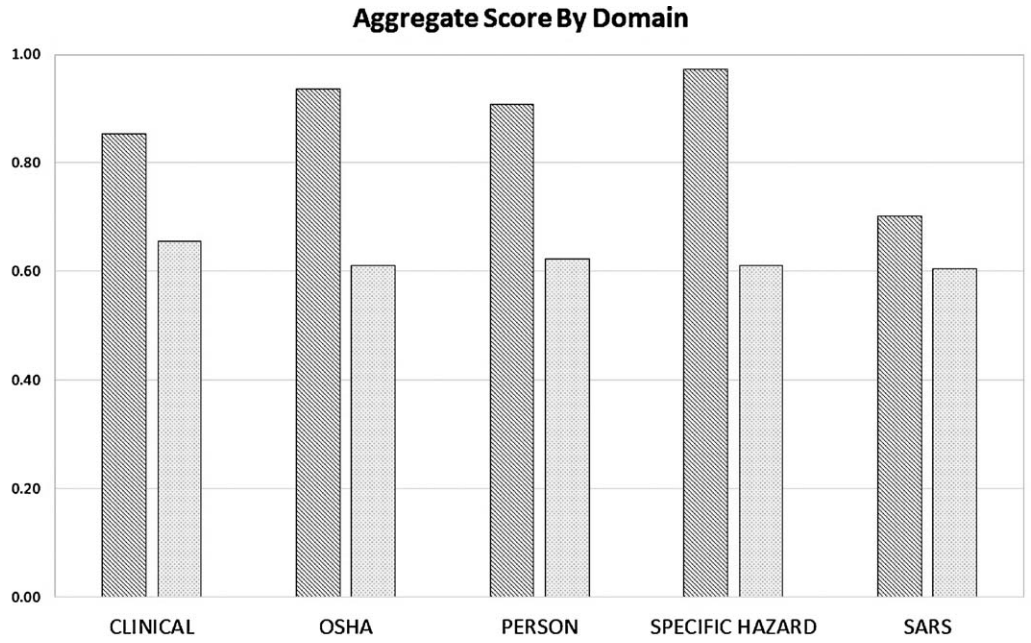

FIGURE 1. Aggregate summary by institutional size. The chart summarizes the average ratings for each of the domains (Good = 1, Suboptimal = 0). Diagonal darker bars are large, and dotted gray bars are small institutions. $P < 0.01$ for all large to small comparisons. The domains are described in Table 3.

experiments affect only a segment of the industry's workers, potential work-related exposure to SARS-CoV-2 is ubiquitous throughout this industry.

Educational institutions typically have a panoply of potential hazards. Even smaller non-research-oriented colleges generally have biology and chemistry laboratories and theater arts departments, each of which is associated with significant occupational hazards.

The descriptions of programs for chemical hazards (eg, Hazard Communication and Chemical Hygiene Plan) were more adequately described than those for other hazard related programs such as Biosafety and Radiation Safety. This may reflect the key role of OSHA compliance for the former, whereas regulations for the latter are often related to other compliance agencies or quasi-mandatory requirements, in particular, those related to laboratory animal management.[10]

A healthy and motivated workforce is important in higher education. Universities and colleges are inherently stressful places to work.[11–13] Ambiguity about access to occupational health services may contribute to workplace stress. Educational institutions are particularly likely to expose both faculty and staff employees to unique organizational stressors. Role ambiguity is frequent; for example, is a faculty member's primary role to do research or to teach? In many companies, the goal is to optimize financial performance, whereas this important aspect often receives little attention in educational programs. Stability of employment is also suboptimal, particularly for untenured faculty members and staff members supported by research grants, which typically have a 3-year life cycle. They may be particularly subject to stressors related to effort-reward imbalance[14] because of the income disparities in comparison to other industries. Relationship structures among faculty, staff, and students are often ambiguous. Finally, and most importantly, the quality of the educational experience is very much determined by the perceptions of the faculty and staff members. Despite these problems, person-oriented services such as psychology support, physical/occupational therapy, and stress management programs were much less frequently available than were hazard oriented programs.

Providing comprehensive employee health and safety services may be particularly challenging for smaller institutions. Innovative approaches such as combining, contracting, or sharing services; use of more telehealth; or other techniques should be considered. Nearly all institutions had web-based communication, demonstrating that their communications had responded quickly to the unanticipated COVID-19 pandemic.

Limitations

This study has several limitations. The information present on the website does not necessarily reflect the actual availability and quality of services. However, the accessibility of information is itself a key component of an effective health and safety program. In addition to information visible on public facing websites, additional materials may be available in printed format or on intranets not

TABLE 5. US Cognate Organizations Relevant to Postsecondary Education OH&S

American College of Occupational and Environmental Medicine (ACOEM) 4,000
American Association of Occupational Health Nurses (AAOHN 4,000
Campus Safety, Health, and Environmental Management Association (CSHEMA)
American Society of Safety Professionals (ASSE) 39,000
International Association for Biosafety & Biosecurity (ABSA) 1,600
American Industrial Hygiene Association 8,500
American College Health Association (ACHA) 3,000
National Council of University Research Administrators (NCURA)
National Association of College and University Business Officers (NCUBO)

The table lists professional organizations relevant to employee health and safety. Where known, the number of members is shown.

referenced on the open websites. The data were abstracted primarily by a single coder, although the coder was carefully supervised, and quality measures were instituted. The sample is intentionally heterogeneous and therefore has a limited number of institutions within each substratum. The findings of the study are not generalizable to all institutions in the United States, although they deliver comprehensive findings that will aid postsecondary institutions in advancing their program and service accessibility. This study does not comprehensively include all occupational health and safety programs and protocols offered across institutions. The sample size, a convenience sample, is not fully proportional to the demographic makeup of higher education institutions in the United States.

Implications

Systematic evaluation of this important sector should include several approaches such as comprehensive interviews with relevant staff and institutional managers; systematic collection of OSHA compliance; analysis of workers compensation claims; and, finally, consensus development of criteria for the effectiveness of each program. Unfortunately, workers' compensation data and OSHA 300 logs will seriously underestimate the injury/disease burden. Collaboration among several relevant organizations would be helpful (see Table 5).

The current COVID-19 pandemic is an increasing concern for employee health in educational institutions. Despite the current significant financial challenges, we believe this interest should be leveraged to create more effective health and safety programs for employees in this large and important industry.

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