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A Moving Target: Highlights from a National Occupational Safety and Health Continuing Education Needs Assessment:

National CE Needs and Interests Trends

Joshua G. Scott, PhD[1,2], **Erin Shore, MPH**[1,2], **Carol Brown, PhD**[1,2], **Carisa Harris, PhD**[4,5], **Mitchel A. Rosen, PhD**[3]

[1]Center for Health, Work & Environment at the Colorado School of Public Health

[2]University of Colorado Denver, Anschutz Medical Campus

[3]Rutgers School of Public Health

[4]University of California, San Francisco, Department of Medicine

[5]University of California, Berkeley, School of Public Health

Abstract

Background—There is a lack of trained Occupational Safety and Health (OSH) professionals able to meet the current and future demand for such expertise in the U.S. Therefore, many professionals are required to perform duties, which are outside of their primary area of expertise; thus, continuing education (CE) may be necessary to properly train individuals for new OSH responsibilities.

Methods—The National Institute for Occupational Safety and Health (NIOSH) funded Education and Research Centers (ERCs) collectively developed and distributed a continuing education survey to gauge the needs and interests of the OSH workforce.

Results—There were 2,064 responses. The most common primary professions represented were safety (28%), occupational health nursing (18%), and industrial hygiene (12%). The majority of respondents (61%) reported that they perform work activities outside of those associated with their primary profession.

Discussion—The CE offerings with the highest interest among respondents were related to safety. Other courses with high levels of interest included topics such as legal issues in OSH (88%), compliance (88%), risk management (85%), OSH management issues (83%), risk communication (83%), and communication in accident prevention (81%). Health and safety leadership (82%), health and safety culture (78%) and Total Worker Health (74%) were also significant interests.

Conclusions—It is critically important to be responsive to the evolving needs to the OS&H community. Developing relevant courses will help ensure that OS&H professionals have access to the training they need to perform essential job functions and keep employees healthy and safe.

Name, mailing address, and email address for the corresponding author: Joshua G. Scott, CU Anschutz Medical Campus, 13001 E. 17th Place, Ste W3111, Aurora, CO, joshua.scott@ucdenver.edu.

Keywords

Continuing Education; Professional Development; Training; Interdisciplinary; Total Worker Health; Occupational Safety and Health

Introduction

The Occupational Safety and Health (OSH) Act of 1970 mandated that the National Institute for Occupational Safety and Health (NIOSH) aid in the education, training and "supply" of health and safety personnel to successfully carry out all of the provisions Act [1]. In 1977 NIOSH operationalized that mandate by funding the first nine Education and Research Centers (ERCs) to facilitate that responsibility and play a key role workforce development. There are now 18 funded centers that span the United States [2].

Continuing education (CE) or professional development delivered to working and non-working professionals outside of the traditional undergraduate and graduate OSH academic programs is one core mechanism the ERCs use to develop the workforce in OSH. In 2011 The National Assessment of the Occupational Safety and Health Workforce Report (also known as the WESTAT Report) documented a deficiency in the supply of trained OSH professionals to meet the current and future demand in the U.S. [3]. Many ERCs and other training centers used the information provided in this report to design and develop new CE programs [2]. The WESTAT report identified a shift in the interdisciplinary nature of safety and health education, citing that many professionals were being required to perform duties outside of their primary profession. In addition, a recent publication by Peckham and colleagues called for a more "holistic and public health oriented" training model reiterating the need for more interdisciplinary educational efforts [4]. However, the data for the WESTAT Report was collected nearly a decade ago and new data is needed to describe current workforce needs and interests to identify if previously trends persist.

In June 2011, NIOSH launched the Total Worker Health® (TWH) Program citing that "scientific evidence now supports…that risk factors in the workplace can contribute to health problems previously considered unrelated to work" [5]. In the WESTAT survey, some wellness and health promotion topic options were available for respondents, but nothing on TWH or peripheral topics such as culture or leadership were asked. In addition, relatively few education and academic professionals were cross training on these topics [3]. Given the changing and evolving needs of OSH professions and professionals, it is essential to periodically assess national CE trends in order to provide relevant and timely educational experiences.

NIOSH funded ERCs are required to periodically collect state and regional level CE needs and interests data to demonstrate the burden and need for specific training and help guide their programming. In the last decade, there has not been funding for a national CE survey. Recognizing this need, NIOSH funded ERCs developed and distributed a national CE needs assessment in 2017 (full needs assessment is located in A). The purpose of this survey was to assess the national training and education needs and preferences of OSH and peripheral professions to inform CE development and dissemination. This study highlights trends

elucidated from the survey and reports key findings that can be used for future CE Course planning.

Methods

The 2017 ERC Continuing Education Needs and Interest Assessment aimed to answer several important questions, including:

- What is the local, regional, and national landscape for CE needs and interests?
- Are professionals seeking CE outside of their primary profession?
- What industries, occupations, and professions are most interested in CE?
- What CE topics and review courses are most relevant to OSH professionals?
- What type of courses and course content do professionals prefer?
- How do professionals search for and receive CE information?
- What costs do professionals expect for various types of CE offerings?

In order to inform question development, the researchers created the draft question set by pulling previously used items from a smaller, unpublished 2015 national ERC needs assessment, incorporating items from the 2011 WESTAT Report and adding additional items on emerging educational topics. Items identifying industry, primary profession and secondary profession were cross referenced to incorporate the National Occupational Research Agenda (NORA) Sectors and Cross Sectors. A draft of the needs assessment was distributed to all 18 ERCs for feedback prior to being finalized. The final survey was input into Qualtrics for online distribution and consisted of 27 questions examining the demographics of the respondent, an extensive list of CE topics of potential interest, organizational resources devoted to CE, and preference for different learning modalities. A copy of the original survey can be found in Appendix A.

ERCs across the country distributed the online survey to their contacts and listservs. The needs assessment was distributed to NIOSH funded Total Worker Health® (TWH) Centers of Excellence, TWH Affiliates, and other various partner organizations including local American Industrial Hygiene Association (AIHA) chapters, the Association of Occupational Health Professionals in Healthcare (AOHP), American College of Occupational and Environmental Medicine (ACOEM), American Society of Safety Professionals (ASSP), and the Society of Human Resource Management also distributed the survey to their networks. No formal marketing or dedicated advertising dollars were used to distribute the survey or solicit responses. The survey was open from August 29, 2017 to December 31, 2017. Due to the use of a convenience sample and the difficulty of calculating a response rate using open rates from emailed surveys, a sampling frame could not be determined. Additionally, as the survey was distributed online through different partners, it was not possible to calculate an accurate response rate, either overall or by sub-groups.

Data were cleaned and analyzed using SAS Version 9.4 (SAS Institute, Cary NC). Some questions were recoded, specifically those asking about business sector and profession

because so many people chose the answer choice “other.” A member of the research team went through all the “Other, please specify” results to see if there were any trends within those responses. If responses fit into one of the answer choices the response was recoded to that response. After examining all the responses, three categories were added to the business sector categories: academia/higher education/research; consulting; and public health. Four categories were added to the primary profession categories: environment, health, and safety professionals; health care professionals (not specific to occupational medicine or occupational health nursing); public health practitioner; and educator/researcher. It is important to note, primary profession and a secondary question inquiring about additional professions outside of primary for which time is spent, were all self-report. Responses to these questions were influenced by how the responder identified professionally, not their job title.

Additional analysis was done to examine the respondents’ perceived interdisciplinarity of work. This was done by observing the number of individuals who responded “yes” that their work was interdisciplinary in nature and also selected at least one additional task outside of their primary profession. A practical example of TWH is the integration of occupational safety and health promotion or business related functions. While some people may select that they are a TWH professional, others may be practicing, but not identifying with TWH. In order to understand the evolving nature of the OSH professions related to TWH, primary and secondary professions were coded to identify individuals that indicated a primarily occupational safety related profession (e.g., industrial hygiene, occupational medicine, occupational safety, etc.) and a primarily health promotion related profession (e.g., worksite wellness, occupational health psychology, human resources, benefits and compensation, etc.), recognizing that within any of these professions overlap may occur. For example, if a respondent selected industrial hygiene as a primary profession and worksite wellness as secondary, they would have been coded into the category of practicing TWH. If a respondent selected occupational safety as a primary and industrial hygiene as their secondary, they would not have been coded into this category. Although TWH was both a primary and secondary professional option for respondents, it was possible that respondents were practicing TWH, but perhaps not labeling it as such. It is also possible that some people might be practicing what we consider TWH but were not labeled as such. For example, an occupational health nurse, who only indicated a primary profession, may have aspects of the job that are both safety and health promotion activities.

Potential CE topics were organized into four categories: 1) management and legal issues; 2) information tools and communication resources; 3) general occupational practice; and 4) workplace concerns. Respondents could indicate an interest in a basic and/or advanced offering for each topic. The number of responses for each answer choice and the percentage of that that number represents are presented for each question. For the questions that were “select all that apply” the percentages may add up to more than 100%, as respondents had the option to select multiple answers.

Results

Respondents

There were 2,064 responses to the survey. There were 1,501 complete responses. Full completion was not mandatory to submit the survey. Number of responses and percent responses for a particular question are reported.

Respondents were from 48 states and Washington, DC. A little over half of the responses (53%) were concentrated among 10 states: Michigan (12%), Texas (8%), Washington (8%), California (5%), Florida (5%), Colorado (4%), North Carolina (4%), New Jersey (3%), Ohio (3%), and Iowa (2%). The over-representation by certain states in the response likely reflects the key survey distribution channel of ERCs. The current place of employment (type), age range, CE decision-making authority and employer sponsored CE activities were asked in the demographic section of this survey. The majority of respondents were from private industry (46%), over the age of 50 (63%), and either decided for themselves or made decisions for others around CE participation (66%). Almost all respondents (85%) indicated that their organizations had resources dedicated to CE. The most commonly selected resource was time for employees to participate in CE (68%), followed by funding for tuition (59%) and funding for travel to attend CE activities (49%). The demographics of respondents are presented in Table 1.

The most common primary professions reported by respondents were safety (28%), occupational health nursing (18%), and industrial hygiene (12%). Nearly two-thirds of respondents (61%) indicted that they perform work outside of their primary professions. The most frequently reported secondary professions were safety (23%), ergonomics (15%), and workplace wellness (14%). Table 2 lists the primary and secondary professions reported by the respondents. Eight percent of primary and ten percent of secondary professions were classified as “other” and include jobs such as firefighting or emergency medical services, engineering, consulting, and administrative work.

There are more interdisciplinary requirements for employees working in smaller organizations, as seen in Table 3 which presents interdisciplinary work by organization size. A chi-square test was run to examine if there was a statistical difference in those performing secondary tasks (i.e., interdisciplinary work) among respondents in small employers (i.e., Less than 300 employees) versus large employers (i.e., greater than 300 employees). The p value was < 0.01 indicating a significant difference.

Of the two-thirds of respondents that indicated their work is interdisciplinary in nature, 14% directly selected TWH as a secondary profession. Furthermore, 587 individuals or 60%, were classified as practicing TWH based on having both safety and health promotion job responsibilities as outlined in the methods section.

Continuing Education Preferences

Most respondents (77%) had participated in an online or hybrid course, though only 52% preferred online or hybrid CE courses. The most preferred course format was live or in person courses, with 77% of respondents indicating that they preferred this type of format. A

vast majority of respondents (89%) were willing to travel, typically within the county, state or region (65%). Fewer respondents indicated they were willing to travel nationally (28%) or internationally (8%).

The preference for price varied by the level and style of CE courses. Most respondents were willing to pay between $50 and $499 for basic courses and $100 and $499 for advanced courses. In general respondents were willing to pay more for live, in-person courses. Respondents most often learned of new CE courses from emails (49%), local professional societies (41%), and advertisements or announcements in publications (36%) (Table 4).

Identified Needs for Continuing Education

Table 5 presents the topics where at least 70% of respondents indicated an interest. See Appendix B for full results. While this needs assessment was designed to be comprehensive, there are many other potential OSH topics that were not included, mainly due to length of the assessment. Results stratified by profession are presented in Appendix C. Only the results for professions with a large enough sample size were included: safety (N = 553), occupational health nursing (N = 360), industrial hygiene (N = 236), and occupational medicine (N = 165).

Professional Review Courses

There was high interest in full-length professional certification review course (either online or in-person). Safety Professionals (Certified Safety Professional and Certified Hazardous Materials Manager), Health Physicists (Health Physics Society), and Ergonomists (Certified Professional Ergonomist), all had over 60% of respondents interested in their professional certification review. Nearly half of Occupational Health Nurses (Certified Occupational Health Nurse (COHN & COHN-Specialist) and Industrial Hygienists (Certified Industrial Hygienist) wanted professional review courses. Interest in online professional review courses was slightly higher than live and in-person courses. Of the respondents who indicated interest, 64% preferred online (or both), and only 36% selected live (or both).

Discussion

The 2017 national continuing education needs assessment identifed overall training needs and preferences for respondents from a variety of OSH professions. The types of training identified as most needed fall within several broad topic areas, including management and legal issues, compliance with new standards, communication tools and skills, risk management and assessment, and safety training. The CE topics with the most interest include injury prevention (back injury prevention), occupational stress, exposure assessment, and safety culture. These overlapping topics show a clear need for cross-training and demonstrate the continued interdisciplinary shift of OSH professoinals. This is reinforced by the number of individuals who indicated that they perform work outside of their primary profession.

There was a significant difference in the interdisciplinarity of work among those working at small employers, indicating that OSH professionals working in small business are often asked to perform tasks outside of the areas in which they have been professionally trained.

Given that small employers make up nearly 80% of the businesses in the U.S. and 50% of employment [6], cross training should be specifically designed and developed for those working in small enterprises.

Compared to the WESTAT Report, there was also a shift towards TWH, culture, and health promotion. The WESTAT report indicated that health promotion was not being covered in OSH programs and that employers were not requesting it. In the current survey, a large percent of respondents (37%) were performing tasks related to health promotion, human resources or TWH. With nearly 60% of respondents classified at practicing TWH, providing cross-training opportunities for a variety of professions on integrated health and safety topics is important. Regardless of profession, leadership skills were indicated as a top training need. The age demographic of respondents in this survey confirm anedcotal reports of a large gap between young health and safety professionals and those close to retirement age. It will be important to deliver CE for developing leadership skills in order to train the next generation to replace seasoned professionals as they retire.

It is generally agreed that OSH management systems should be in place at all workplaces to prevent injuries and illnesses from occurring in the workplace. OSHA's Injury and Illness Prevention Program (I2P2) includes management leadership, worker participation, hazard identification and assessment, hazard prevention and control, education and training, and program evaluation and improvement [7]. Training the workforce in OSH management systems will address the broad topics identified in the survey. Implementing effective management systems will lead to improved safety culture, decreased injuries and illnesses, and better communication skills for employees. Training OSH professionals to develop and implement OSH management systems will also uncover additional types of training needed by individuals and their employers. Understanding the vital role that training has for improving worker safety and health is an ongoing process. By having the OSH management system in place will allow employers to identify these needs, and address them through a comprehensive training program.

It's important to note that no marketing dollars were spent administering, distributing, and collecting and analyzing survey responses. As such, the respondents in this study consisted of a convenience sample prompted by various partner listservs, social media posts and direct outreach at events. Although the current survey does have a large national geographic reach, some areas are less represented and the results may not apply to all OSH and related occupations broadly. Future training and education survey research should expand findings to include responses from employers – i.e., what training to they need and what skills are they looking for, professional societies and academic institutions who are the traditional mechanism for training professionals.

Continuing to develop and deliver training opportunities for professionals using a variety of instructional design methods ranging from asynchronous online courses to live, in-person training events is critically important. Respondents indicated a mix of preferences in CE delivery, and location and cost emerged as the most significant barriers to participation. Although many respondents indicated they were willing to travel for CE, the distance was often limited to regional travel. This trend validates the need for regional NIOSH-funded

ERCs, who focus on serving local, state and regional training needs. The 18 NIOSH-funded ERCs across the U.S. house experts for developing and implementing training. The ERC CE programs are a valuable resource to help OSH professionals identify training needs and to develop courses to meet those needs, in addition to the valuable CE opportunities that are provided by other organizations, including professional societies, academic institutions, and private vendors. The ERC CE programs can provide both broad approaches and specific training that will increase the effectiveness of OSH professionals to meet the challenges they face.

Conclusions

The success of ERCs and TWH Centers of Excellence to develop and deliver relevant CE courses hinges on their ability to be responsive to evolving workforce needs and preferences. Developing relevant, tailored and cross-cutting courses will help ensure that OSH professionals have access to the training they need.

A more significant national survey effort should include more responses from peripheral professionals who are engaged with OSH at work, such as human resource professionals. As indicated in this study, the interdisciplinary demands on employees continue to grow, especially for those working in small employers. This trend is anticipated to continue as the nature of work is evolving. The way individuals experience work – i.e., contingent, part-time, contract, remote, etc., will continue to impact OSH as well as other emerging issues such as disaster preparedness and response, cultural shifts, and the opioid crisis. These may not be traditional core OSH issues, but they certainly intersect with the workplace in a dramatic and unavoidable way. As these issues rise to the level of key business decisions for organizations, the need for training high quality OSH professionals that can aid in complex problem solving will be critically important.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Institution at which the work was performed

Center for Health, Work & Environment at the Colorado School of Public Health and the University of Colorado Denver, Anschutz Medical Campus

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Table 1.

Respondent Demographics

Employer Type of Respondents	
Industry (N = 1,975)	**N (%)**
Private Industry	889 (46%)
Federal Government	143 (7%)
State Government	223 (11%)
Local Government	151 (8%)
Higher Education	286 (15%)
Not for Profit (i.e. nonprofit)	232 (12%)
Foreign Government	5 (0.3%)
Non-Governmental Organization	35 (2%)
Tribal Government	1 (0.1%)
Age Ranges of Respondents	
Age Range (N = 1,528)	**N (%)**
18 – 29	65 (4%)
30 – 39	183 (12%)
40 – 49	310 (20%)
50 – 59	534 (35%)
60 – 69	386 (25%)
70 or older	50 (3%)
Decision Making for CE	
Response (N = 1,541)	**N (%)**
I don’t decide (directed by others)	96 (6%)
I decide (informed by others – e.g., professional society, supervisor)	434 (28%)
I decide (completely self directed)	771 (50%)
I decide and am responsible for others	240 (16%)

Table 2.

Primary and Secondary Professions of Respondents

Response	Primary Profession, N=1,984 N (%)	Secondary Profession, N=1,984 N (%)
Safety	553 (28%)	473 (23%)
Occupational health nursing	360 (18%)	58 (3%)
Industrial hygiene	236 (12%)	265 (13%)
Occupational medicine	165 (8%)	91 (4%)
Epidemiology	74 (4%)	115 (6%)
Environmental health and safety (EHS)	59 (3%)	19 (1%)
Total Worker Health	49 (3%)	165 (8%)
Human resources	46 (2%)	163 (8%)
Education/research	45 (2%)	23 (1%)
Health care	43 (2%)	34 (2%)
Environmental engineering	41 (2%)	125 (6%)
Ergonomics	32 (2%)	314 (15%)
Workplace wellness	31 (2%)	285 (14%)
Public health practitioner	19 (1%)	11 (1%)
Health physics	17 (1%)	55 (3%)
Occupational health psychology	16 (1%)	49 (2%)
Toxicology	14 (1%)	105 (5%)
Benefits and compensation professional	11 (1%)	85 (4%)
Physical therapist	7 (0.4%)	9 (0.4%)
Other	166 (8%)	196 (10%)

Table 3.

Interdisciplinary Work by Organization Size

Response	300 or fewer employees N = 597	More than 300 employees N = 898
Yes	417 (70%)	564 (63%)
No	180 (30%)	334 (37%)

A chi-square test yielded a p-value of < 0.01.

Table 4.

Sources of Information for Continuing Education Offerings

	N (%)
Email listservs	1,014 (49%)
Local professional society announcements	841 (41%)
Advertisements or announcements in publications	747 (36%)
From colleagues	737 (36%)
Direct mailing	660 (32%)
Online search	585 (28%)
Word of mouth	455 (22%)
Conference expos	445 (22%)
Employer	365 (18%)
Social media	216 (11%)
ERC website	127 (6%)
Other	42 (2%)

Table 5.

Continuing Education Topics of Greatest Interest

Topic	Percent Interest (N=1501)
Management and Legal Issues	
Legal Issues in occupational safety and health	88%
Compliance with new standards (OSHA, state, other)	88%
Risk management/risk assessment	85%
Health and safety system management issues	83%
Leadership skills for occupational safety and health professionals	75%
Workers' compensation	70%
Information Tools and Communication Resources	
Communications in accident prevention	81%
Risk communication	83%
Right to know & hazard communication	76%
Use of social media in occupational safety and health	75%
Workplace health promotion	72%
General Occupational Practice	
Occupational safety	84%
Ergonomics	79%
Total Worker Health	74%
Industrial hygiene	73%
Workplace Concerns for Which CE Courses are Needed	
Exposure assessment	83%
Safety culture	83%
Injury prevention (including traumatic injuries)	82%
Back injury prevention	80%
Occupational stress	80%
Disaster preparedness and emergency response	79%
Musculoskeletal health	75%
Respiratory health (including respiratory protection)	75%
Hearing loss/conservation program	74%
Workplace violence	70%