

# **SCERC Needs Assessment Survey – FY 2020/2021**

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## **INTRODUCTION**

The continuous quality improvement process of our academic programs in the Southern California Educational and Research Center (SCERC) involves the analysis of our performance, identification of educational needs, design of intervention plans, and further evaluation of outcomes. This process is carried out by the SCERC Planning and Evaluation Administration in collaboration with the External Advisory Committee and the Executive Committee. The analysis of our performance involves review of program evaluations by current trainees, alumni feedback, and program evaluations by our schools, as well as statements on competencies and skills required by the accrediting organizations for each of the academic programs and by the leading professional societies. Another core component of the evaluation process is to conduct needs assessment surveys. Though each program recruits and mentors its own trainees, the alumni feedback obtained refers to both the quality of the individual programs (IH, OEHN, OMR, etc.) as well as SCERC as a whole. This report summarizes findings of the SCERC needs assessment surveys that were conducted during 2020-2021.

For the purpose of the SCERC needs assessment surveys in 2020-2021, we identified three survey target audiences: (1) Potential employers of our graduates in the private and public sector. This group included EHS managers who have participated in our continuing education courses over the last 5 years. (2) Practicing professionals who are members of major professional organizations in the occupational health (OH) field within region IX; including the California State Association of Occupational Health Nurses (CSAOHN, American Industrial Hygiene Association (AIHA), and Western Occupational and Environmental Medicine Association (WOEMA). (3) Alumni from at least the last 4 years (2017-2020) from our three core academic programs: Industrial Hygiene (IH), Occupational and Environmental Health Nursing (OEHN), and the Occupational Medicine Residency (OMR).

Our goal in conducting these needs assessment surveys was to identify unmet needs among potential employers in the region, practicing OH professionals, and our program alumni. The surveys asked private and public employers for information about their organizations' expected future needs for trained OH professionals and what specific qualifications and skills they consider when hiring OH professionals. The surveys asked practicing professionals about their level of educational training, practice setting, important job skills needed, and their needs for continuing education. The surveys asked our alumni if they are currently working in the OH field, about any barriers to finding a job, their perceptions about important competencies and skills, and their views on how our programs prepared them for their current occupation. We are using the survey results to assist us in assessing the need for modifications or enhancements of our academic programs and continuous education courses.

## **METHODS**

### **Survey development**

Five questionnaires for the target groups were developed by Center Administration, with the participation and guidance of the academic program directors. The private and public employers survey comprised questions about current job, academic training, the skills needed for working as an industrial hygienist, occupational health nurse, occupational and environmental epidemiologist and occupational medicine physician, the need for and supply of occupational health professionals, the importance of a professional certification, and CE needs. For the members of the professional organizations, similar sets of questions were formulated for comparison purposes. For Continuing Education, we wanted to identify the preferred type of courses, days and time. The alumni survey included questions about the type of program pursued, certifications obtained, current job, importance of specific skills for the job, quality of the training received for those skills, and questions about CE needs.

Questions for the surveys were developed using prior SCERC needs assessment surveys with additional questions on employer needs and OH professional skills modified from meetings with experts within each field. The surveys also included questions based on the statements of expected competencies and skills delineated by the programs' accrediting organizations and professional societies for each OH discipline. Questions about needed competencies and skills were asked using the same wording for the surveys of employers, practicing professionals, and program alumni in each discipline. Responses were structured as four or five item Likert scale (ordinal) responses. Program directors reviewed the draft surveys and provided comments.

An online survey tool (Survey Monkey) was used for the creation of the five surveys. All respondents were invited to participate via e-mail. The survey was distributed to occupational health program managers. For practicing OH professionals, we contacted the American Industrial Hygiene Association (AIHA) for IH, the American Association of Occupational Health Nurses (CSAOHN) for OEHN, and the Western Occupational and Environmental Medicine Association (the largest regional affiliate of the ACOEM) to request that the societies either provide us with email lists of their members or distribute email notices of the survey with a link to the online survey. The alumni were notified by email about the survey, since each academic program maintains contact information for their alumni. All communications provided a hyperlink to the online survey. Two survey reminders were sent to all target groups approximately two and four weeks after the first email had been sent.

## **Data analysis**

Descriptive statistics were calculated for each survey questionnaire by target group. For questions with Likert scale responses, we examined the distribution of responses by response category and also calculated average rating using scores of 1 to 4 for questions with four response categories or 1 to 5 for questions with five response categories. For example, responses to the questions about importance of skills in the job had five response categories from "not important" to "very important", which were scored from 1 to 5. The average rating was the numerical average of the response scores by all respondents to the question.

**Employers perception of current need for and supply of occupational health professionals by discipline.** To assess private and public employers need for and supply of occupational health professionals, responses to the question "thinking about the next 5 years, what is the

likelihood that your company will search for an occupational health professional in the following areas?” were tabulated. A four-point Likert scale with responses that ranged from “not at all” to “very high” (scored from 1 to 4) was used to calculate average ratings.

Regarding the employers perception of the supply for well-trained professionals in EHS, responses to the question “do you believe that the supply of well-trained professionals is:” were tabulated. A four-point Likert scale with responses that ranged from “clear shortage” to “over supply” was used to calculate average ratings.

**Employers anticipated need for academically trained OH professionals.** In order to identify employers anticipated future needs of OH professionals with academic training, responses to the question “if you are hiring in these areas, how important is it for you to hire professionals with formal training in that discipline?” were tabulated. A four-point Likert scale with responses that ranged from “not at all” to “very high” was used to calculate average ratings.

**Importance of the skills for the job.** Responses to the question “how important are these skills for the work as”: industrial hygienist, occupational health nurses, and occupational medicine were tabulated. A five-point Likert scale with responses that ranged from “not important” to “extremely important” was used to calculate average ratings.

**Quality of the training received.** To assess the quality or quantity of the training received by survey respondents, responses to the question “At the time of your graduation, how well were you trained in the following skills?” were tabulated. A five-point Likert scale with responses that ranged from “no training”, “limited training”, “good training”, “very good training”, and “excellent training” was used to calculate the average ratings.

**Continuing education.** Our SCERC provides training in a broad range of Environmental Health and Safety (EH&S) topics. These courses are targeted to different audiences including students, occupational hygienist, nurses, physicians, and professionals interested in occupational health and safety issues. All of the surveys asked the target populations about the importance of a list of EH&S topics for continuing education. A five-point Likert scale with responses that ranged from “not at all” to “very high” was used to calculate rating averages.

## RESULTS

### 1. **Response Rates and Respondent Characteristics**

A total of 187 professionals in the occupational health and safety field answered the needs assessment survey. The response rate ranged from 1.36% (private and public employers) to 17.2% (EHS/OSH survey going to Occupational Medicine Residency alumni and WOEMA, Table 1).

**Private Employers.** A total of 2200 working professionals were contacted through e-mail and 14 (1%) of them answered the survey. Among them, their highest academic degree was a master degree (62.5%), or associate/bachelor degree (25%). None were certified in industrial hygiene

(CIH) or safety professional (CSP). Most of them were working in the healthcare sector (66.7%), followed by other (33.3%).

**Public Employers.** A total of 2200 working professionals were contacted through e-mail and 16 (1%) of them answered the survey. Among them, their highest academic degree were doctorate degree (25%), master degree (37.5%), or associate/bachelor degree (37.5%). Four participants were certified industrial hygienists (33.3%), three were certified safety professionals (27.3%) and one had a continuing professional education (CPE) certification (10%). The respondents reported working in the following industry sectors: university or education organization (52.9%), other (25.5%), local public health department (17.7%), health care provider organization (11.8%), state public health department (5.9%), national occupational health or public health department (5.9%) and regulatory agency (5.9%, multiple responses allowed).

Table 1: SCERC needs assessment survey response rates by target population group.

Survey	Groups Included	Number of Invitations	Completed Surveys	Response Rate(%)
Private + Public Employers	CE contact List	2200	30	1.36
IH Survey	Regional AIHA List + IH Alumni	416	23	5.53
OEHN Survey	Cal State OHN List + OEHN Alumni	126	14	11.11
EHS/OSH Survey	ERC Alumni <sup>1</sup> excluding OEHN and IH + WOEMA <sup>2</sup>	698	120	17.19

<sup>1</sup>ERC alumni targeted for this survey included OMR, TRT and PPRT alumni and awardees

<sup>2</sup>WOEMA has approximately 600 active members of whom 2/3 thirds are physicians.

**IH Survey.** A total of 416 regional AIHA members and UCLA IH alumni were contacted through e-mail and 23 (5.5%) of them answered the survey. Among them, their highest academic degree was a master (69.6%), doctoral (17.4%) or bachelor (13.0). Seven respondents (30.4%) were alumni of the UCLA IH program. More than half of the participants completed academic training as an industrial hygienist (69.6%) and 3 (13.0%) completed training as an occupational safety specialist. Among these participants, 14 (66.7%) were certified as industrial hygiene professionals (CIH) and 10 (50%) were certified as safety professionals (CSP). One person was certified in ergonomics (CPE) (6.7%). Respondents worked in research (21.8%), corporate occupational health (17.4%), consulting (13.0%), other (13.0%), governmental agency (13.0%), academic education (8.7%), corporate environmental health (8.7%) and training/continuing education (4.4%, multiple responses allowed).

**OEHN Survey.** A total of 126 Cal-State OHN members and UCLA OEHN alumni were contacted through e-mail and 14 (11.1%) of them answered the survey. Among them, all respondents had a masters degree (92.9%), except one who had an Associate of Science (AS) degree (7.1%). Eight respondents (57.1%) were alumni of the UCLA OEHN program and 64.3% were graduates from an OEHN/OHN academic program. Among the professionals who did not have an OEHN/OHN degree, 21.4% had an OEHN/OHN certification. Most of the

participants selected ‘other’ for their practice setting (54.6%), followed by clinical occupational health (18.2%), government agencies (9.1%), consultation (9.1%), and management (9.1%).

**EHS/OSH Survey.** A total of 698 WOEMA members and ERC alumni were contacted through e-mail and 120 (17.2%) of them answered the survey. ERC alumni targeted for this survey included OMR alumni (n=11), targeted research training (TRT) and pilot project research training (PPRT) alumni and awardees (n= 32). A total of 53 physicians (44.2%) responded to the survey. Of the respondents, 47 were MDs and 6 were DOs. Among respondents, 28 (23.7%) were alumni from the UCLA SCERC and 48 (44.4%) had occupational medicine as their primary discipline. Among all participants, 56 (49.6) stated they have full-time work that includes all occupational health responsibilities.

## **2. Employer Need and Supply of Occupational Health Professionals**

A core objective of the needs assessment survey is to determine the perceived need for and supply of academically trained OH professional by private and public employers in the region. This section reports on these issues.

### **A. Private Employers**

According to the private employer survey, the likelihood that a private company will search for an occupational health professional by discipline in the next five years is moderately high for nursing, moderate for safety and industrial hygiene, and relatively low for occupational medicine, ergonomics, and environmental and occupational epidemiologists (Table 2).

**Table 2.** Likelihood that a private employer will search for an EHS professional in certain areas during the next five years.

<b>Need for professionals</b>	<b>Average Rating*</b>	<b>Response Count</b>
Safety	2.2	6
Industrial Hygiene	2.2	6
Ergonomics	1.8	6
Occupational Medicine	1.8	6
Occupational Health Nursing	2.7	6
Environmental Epidemiology	1.5	6
Occupational Epidemiology	1.5	6

\*Numerical average of Likert scale responses: not at all (1), fairly low (2), moderately high (3), and very high (4).

Private employers also perceive that the supply of well-trained professionals is low in all employment sectors including safety, industrial hygiene, ergonomics, occupational medicine, occupational health nursing, occupational epidemiology and environmental epidemiology (Table 3).

Table 3. Private employers’ perception about the supply of EHS professional in certain areas

<b>Supply of Professionals</b>	<b>Average Rating*</b>	<b>Response Count</b>
Safety	1.7	6
Industrial Hygiene	1.7	6
Ergonomics	1.5	6
Occupational Medicine	1.6	6
Occupational Health Nursing	1.5	6
Occupational Epidemiology	1.5	5
Environmental Epidemiology	1.5	6

\* Numerical average of Likert scale responses: clear shortage (1), low supply (2), sufficient supply (3) and over supply (4).

### **B. Public Employers**

The likelihood that a public employer will search for an occupational health professional (industrial hygiene, safety, ergonomics, occupational health nursing, occupational medicine, occupational epidemiology, and environmental epidemiology) during the next five years is moderately high for safety and industrial hygiene and fairly low for occupational and environmental epidemiology, occupational medicine, occupational health nursing and ergonomics. (Table 4).

Table 4. Likelihood that a public employer will search for an occupational health professional in certain areas during the next five years.

<b>Need for professionals</b>	<b>Average Rating*</b>	<b>Response Count</b>
Environmental Epidemiology	1.6	11
Occupational Epidemiology	1.5	11
Occupational Medicine	1.6	11
Industrial Hygiene	2.5	11
Safety	3.0	11
Occupational Health Nursing	1.7	11
Ergonomics	2.0	11

\* Average of Likert scale responses: not at all (1), fairly low (2), moderately high (3), and very high (4)

Public employers reported that the supply of well-trained professionals is low in safety, ergonomics and industrial hygiene and that there is a clear shortage in occupational health nursing, occupational medicine and environmental and occupational epidemiology (Table 5).

Table 5. Public employers perception about the supply of EHS professional in certain areas

<b>Supply of Professionals</b>	<b>Average rating*</b>	<b>Response count</b>
Safety	2.0	11
Ergonomics	1.9	10
Industrial Hygiene	2.0	11
Occupational Health Nursing	1.0	11
Environmental Epidemiology	1.0	11
Occupational Medicine	1.0	11
Occupational Epidemiology	1.0	11

\*Likert scale includes: clear shortage (1), low supply (2), sufficient supply (3) and over supply (4).

### **C. Employers Future Need for Formally Trained OH Professionals**

Private employers reported that hiring professionals with formal training in safety is very important (Table 6). Hiring professionals in industrial hygiene, occupational health nursing, occupational medicine, occupational epidemiology, environmental epidemiology, and ergonomics is of average importance. On the other hand, public employers think that formal training is very important for all disciplines (Table 7).

Table 6. Private employers' rating of importance of hiring professionals with formal training in a specific discipline

<b>Need for academic training of professionals</b>	<b>Average Rating*</b>	<b>Response Count</b>
Industrial Hygiene	3.4	5
Occupational Health Nursing	3.3	6
Occupational Medicine	3.0	6
Occupational Epidemiology	2.6	5
Safety	3.6	5
Environmental Epidemiology	2.8	5
Ergonomics	3.0	5

\*Likert scale includes: not at all important (1), of little importance (2), of average importance (3), very important (4), extremely important (5).

Table 7. Public employers rating of the importance of hiring professionals with formal training in a specific discipline

<b>Need for academic training of professionals</b>	<b>Average Rating*</b>	<b>Response Count</b>
Occupational Medicine	4.1	11
Occupational Epidemiology	3.9	11
Industrial Hygiene	4.1	11
Safety	4.2	11
Environmental Epidemiology	3.8	11
Occupational Health Nursing	4.0	11
Ergonomics	3.8	11

\*Likert scale includes: not at all important (1), of little importance (2), of average importance (3), very important (4), extremely important (5).

### 3. Assessment of Skills and Training by SCERC Academic Program Discipline

The SCERC needs assessment surveys asked equivalent questions to employers, practicing professionals, and program alumni for each discipline about the importance of specific skills in the job position. This section will report on the responses for each discipline for each group of respondents.

#### A. **Industrial Hygiene**

##### Industrial Hygiene Skills

The surveys asked questions about the importance of skills to AIHA members and the IH program alumni.

The top five skills ranked as most important for the job as an industrial hygienist were: identify potentially hazardous agents or work conditions (4.9), evaluate and control of physical, mechanical, chemical, and biological hazards (4.8), exposure assessment and risk characterization (4.7), understand workers' jobs (4.6), proper interpretation of exposure monitoring data (4.6) and understand the fundamentals of occupational safety (4.6) (Table 8). The five skills ranked as least important were: understand workers compensation insurance issues (3.0), hazard associated with nanotechnology (3.5), emergency response planning (3.7), hazardous waste management (3.8) and apply statistical concepts and tools appropriate to professional practice in the field (3.8) (Table 8). It should be noted that even the lower rated skills were considered to be at least moderately important by the AIHA members.

Table 8. IH survey respondent rating of importance of job skills for an industrial hygienist.

<b>Skills</b>	<b>Average Rating* (n=22)</b>
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1	Identify potentially hazardous agents or work conditions	4.9
2	Interpret and apply state or federal regulations	4.3
3	Understand workers' jobs	4.6
4	Exposure assessment and risk characterization	4.7
5	Evaluate and control of physical, mechanical, chemical, and biological hazards	4.8
6	Proper interpretation of exposure monitoring data	4.6
7	Understand professional and ethical responsibilities of an industrial hygienist	4.4
8	Evaluate and recommend personal protective equipment	4.3
9	Evaluate indoor air quality	4.1
10	Communicating with management	4.4
11	Communicating with mid-level management - supervisors	4.4
12	Ability to write technical reports and summaries	4.4
13	Understand the need for working as part of an interdisciplinary team.	4.5
14	Recognize the need for life-long learning	4.5
15	Understand the fundamentals of occupational safety	4.6
16	Prevent work accidents and manage safety programs	4.3
17	Communicating with colleagues	4.6
18	Attain recognized professional certification after the required period of professional practice	4.1
19	Program leadership and management	4.2
20	Communicating with workers, union reps, or the public	4.5
21	EH&S training for employees	4.0
22	Evaluate and recommend administrative controls	4.4
23	Evaluate and manage ergonomic factors	3.9
24	Emergency response planning	3.7
25	Apply qualitative and quantitative risk assessment tools from ACGIH, NIOSH, and others to identify unacceptable risk	4.2
26	Hazardous waste management	3.8
27	Critically analyze and evaluate scientific literature	4.0
28	Apply statistical concepts and tools appropriate to professional practice in the field	3.8

29	Program budget and finance skills	4.0
30	Understand workers compensation insurance issues	3.0
31	Hazard associated with nanotechnology	3.5

\*Average of responses scored: not important (1), slightly important (2), moderately important (3), important (4), and very important (5).

### **Quality of the Training Received**

The survey respondents were asked to rate the quality of the training received during the academic program in skills for the job as industrial hygienist. The five highest rated skills by numerical average of the 5-point Likert scale responses were: recognize the need for life-long learning (3.6), critically analyze and evaluate scientific literature (3.5), ability to write technical reports and summaries (3.3), evaluate and control of physical, mechanical, chemical, and biological hazards (3.2) and proper interpretation of exposure monitoring data (3.2). On the other hand, lower evaluations were for: hazards associated with nanotechnology (1.7), program budget and finance skills (1.8), understand workers compensation insurance issues (1.8), communicating with mid-level management – supervisors (1.9), communicating with management (2.0), emergency response planning (2.0), and communicating with workers, union reps, or the public (2.0, Table 9).

Table 9. IH survey respondent evaluation of the quality of the training received during their academic program in the skills for the job as industrial hygienist.

	<b>Skills</b>	<b>Average Rating* (n=20)</b>
1	Critically analyze and evaluate scientific literature	3.5
2	Recognize the need for life-long learning	3.6
3	Ability to write technical reports and summaries	3.3
4	Understand professional and ethical responsibilities of an industrial hygienist	3.1
5	Evaluate and control of physical, mechanical, chemical, and biological hazards	3.2
6	Proper interpretation of exposure monitoring data	3.2
7	Identify potentially hazardous agents or work conditions	3.1
8	Apply statistical concepts and tools appropriate to professional practice in the field	3.1
9	Attain recognized professional certification after the required period of professional practice	2.9
10	Exposure assessment and risk characterization	3.1

11	Understand the need for working as part of an interdisciplinary team.	2.6
12	Evaluate and recommend personal protective equipment	2.9
13	Evaluate and recommend administrative controls	2.8
14	Understand the fundamentals of occupational safety	3.0
15	Apply qualitative and quantitative risk assessment tools from ACGIH, NIOSH, and others to identify unacceptable risk	2.9
16	Interpret and apply state or federal regulations	2.8
17	Understand workers' jobs	2.3
18	Evaluate indoor air quality	2.6
19	EH&S training for employees	2.6
20	Evaluate and manage ergonomic factors	2.9
21	Prevent work accidents and manage safety programs	2.4
22	Communicating with colleagues	2.4
23	Hazardous waste management	2.1
24	Program leadership and management	2.2
25	Communicating with workers, union reps, or the public	2.0
26	Emergency response planning	2.0
27	Communicating with mid level management - supervisors	1.9
28	Communicating with management	2.0
29	Understand workers compensation insurance issues	1.8
30	Program budget and finance skills	1.8
31	Hazards associated with nanotechnology	1.7

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\*Average of responses scored: no training (1), limited training (2), good training (3), excellent training (4), and outstanding training (5).

A comparison of the rating average of the importance of the skills for the work as an industrial hygienist ranked by AIHA members and the quality of the training received in those skills by the IH alumni is shown in Table 10. The top 5 notable differences were observed for ‘communicating with mid-level management- supervisors’ (importance of skill: 4.4; quality of training: 1.9), ‘communicating with workers, union reps or the public’ (importance of skill: 4.5; quality of training: 2.0), ‘communicating with management’ (importance of skill: 4.4; quality of training: 2.0), ‘understand workers’ jobs’ (importance of skill: 4.6; quality of training: 2.3), and ‘program budget and finance skills’ (importance of skill: 4.0; quality of training: 1.8).

Table 10. Comparison of the average ratings of the importance of skills for work as an industrial hygienist and the quality of the training received in those skills by survey respondents.

	<b>Skills for the work as IH</b>	<b><u>Importance*</u> of the skills (n=22)</b>	<b><u>Quality<sup>y</sup></u> of training (n=20)</b>
1	Identify potentially hazardous agents or work conditions	4.9	3.1
2	Interpret and apply state or federal regulations	4.3	2.8
3	Understand workers' jobs	4.6	2.3
4	Exposure assessment and risk characterization	4.7	3.1
5	Evaluate and control of physical, mechanical, chemical, and biological hazards	4.8	3.2
6	Proper interpretation of exposure monitoring data	4.6	3.2
7	Understand professional and ethical responsibilities of an industrial hygienist	4.4	3.1
8	Evaluate and recommend personal protective equipment	4.3	2.9
9	Evaluate indoor air quality	4.1	2.6
10	Communicating with management	4.4	2.0
11	Communicating with mid-level management - supervisors	4.4	1.9
12	Ability to write technical reports and summaries	4.4	3.3
13	Understand the need for working as part of an interdisciplinary team.	4.5	2.6
14	Recognize the need for life-long learning	4.5	3.6
15	Understand the fundamentals of occupational safety	4.6	3.0
16	Prevent work accidents and manage safety programs	4.3	2.4
17	Communicating with colleagues	4.6	2.4
18	Attain recognized professional certification after the required period of professional practice	4.1	2.9
19	Program leadership and management	4.2	2.2
20	Communicating with workers, union reps, or the public	4.5	2.0
21	EH&S training for employees	4.0	2.6

22	Evaluate and recommend administrative controls	4.4	2.8
23	Evaluate and manage ergonomic factors	3.9	2.9
24	Emergency response planning	3.7	2.0
25	Apply qualitative and quantitative risk assessment tools from ACGIH, NIOSH, and others to identify unacceptable risk	4.2	2.9
26	Hazardous waste management	3.8	2.1
27	Critically analyze and evaluate scientific literature	4.0	3.5
28	Apply statistical concepts and tools appropriate to professional practice in the field	3.8	3.1
29	Program budget and finance skills	4.0	1.8
30	Understand workers compensation insurance issues	3.0	1.8
31	Hazard associated with nanotechnology	3.5	1.7

\*Average of responses scored: not important (1), slightly important (2), moderately important (3), important (4), and very important (5).

γ Average of responses scored: no training (1), limited training (2), good training (3), excellent training (4), and outstanding training (5).

## B. Occupational and Environmental Health Nursing

### Occupational and Environmental Health Nursing Skills

The surveys asked equivalent questions about the importance of skills to CSAOHN members, and the OEHN program alumni.

Among the OEHN survey respondents, the top five skills ranked as most important for work as an Occupational Health nurse were: interpreting and applying state and federal regulations (4.9), assessing the health needs of works and worker populations (4.8), clinical practice (4.8), communicating with workers, union reps, or the public (4.7), and conducting health and injury assessments (4.7). In contrast, the five skills ranked as less important were: case management programs (3.6), program budget and finance skills (3.6), managing travel health programs (3.7), managing substance abuse programs (3.7), and technical writing (3.8, Table 11).

Table 11. CSAOHN members (with master or doctoral degree) rating of the importance of the skills for the job as an occupational health nurse.

	<b>Skills</b>	<b>Average Rating * (n=9)</b>
1	Communicating with management	4.4

2	Assessing the health needs of works and worker populations	4.8
3	Analyzing risks associated with worksite hazards	4.6
4	Communicating with mid-level management & supervisors	4.4
5	Communicating with colleagues	4.3
6	Communicating with workers, union reps, or the public	4.7
7	Managing occupational health surveillance program	4.3
8	Interpreting and applying state and federal regulations	4.9
9	Managing workers compensation cases	4.2
10	Conducting health and injury assessments	4.7
11	Developing injury and illness prevention programs	4.0
12	Program leadership and management	4.1
13	Evidence-based practice	4.2
14	Developing return to work programs	3.9
15	Evaluating and managing ergonomic factors	3.9
16	Clinical practice	4.8
17	Program budget and finance skills	3.6
18	Managing health promotion programs	3.8
19	Case management programs	3.6
20	Critically analyzing and evaluating scientific literature	4.1
21	Technical writing	3.8
22	EH&S training for employees	4.0
23	Managing sprains and strains	4.2
24	Participating in health care quality improvement	4.0
25	Managing emergency preparedness plan	4.3
26	Managing workplace violence programs	4.3
27	Managing travel health programs	3.7
28	Managing substance abuse programs	3.7

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\*Average of responses scored: not important (1), slightly important (2), moderately important (3), important (4), and very important (5).

## Quality of the Training Received by the OEHN Alumni

Regarding the evaluation of the quality of the training received during the academic program in the skills for the job as an occupational health nurse, the five higher scores were: critically analyzing and evaluating scientific literature (4.7), evidence-based practice (4.7), communicating with colleagues (4.2), clinical practice (4.0), conducting health and injury assessments (4.0), and analyzing risks associated with worksite hazards (4.0). On the other hand, the lower evaluations were for: managing substance abuse programs (2.9), case management programs (2.9), program budget and finance skills (2.9), managing travel health programs (3.0), and EH&S training for employees (3.2), communicating with workers, union reps, or the public (3.2), developing return to work programs (3.2), and managing workplace violence programs (3.2, Table 12).

**Table 12.** Ranking of the quality of the training received in the skills for the work as an Occupational Health Nurse by respondents of the OEHN survey.

	<b>Skills for the work as an Occupational Health Nurse</b>	<b>Average Rating* (n=9)</b>
1	Assessing the health needs of worker populations	3.9
2	Analyzing risks associated with worksite hazards	4.0
3	Evaluating and managing ergonomic factors	3.9
4	Managing occupational health surveillance program	3.3
5	Conducting health and injury assessments	4.0
6	Managing sprains and strains	3.8
7	Managing workers compensation cases	3.6
8	Managing emergency preparedness plan	3.4
9	Managing workplace violence programs	3.2
10	Managing substance abuse programs	2.9
11	Managing travel health programs	3.0
12	Managing health promotion programs	3.4
13	Participating in health care quality improvement	3.3
14	Critically analyzing and evaluating scientific literature	4.7
15	Evidence-based practice	4.7
16	Clinical practice	4.0
17	Case management programs	2.9

18	Developing injury and illness prevention programs	3.4
19	Developing return to work programs	3.2
20	Program leadership and management	3.7
21	Program budget and finance skills	2.9
22	Communicating with management	3.7
23	Communicating with mid level management - supervisors	3.6
24	Communicating with colleagues	4.2
25	Communicating with workers, union reps, or the public	3.2
26	Technical writing	3.8
27	EH&S training for employees	3.2
28	Interpreting and applying for state and federal regulations	3.7

\*Average of responses scored: no training (1), limited training (2), good training (3), excellent training (4), and outstanding training (5).

A comparison of the rating average of the importance of the skills for the work as an occupational health nurse and the quality of the training received in those skills by the OEHN survey respondents is shown in Table 13. The top 5 notable differences were observed for ‘communicating with workers, union reps or the public’ (importance of skill: 4.7; quality of training: 3.2), ‘interpreting and applying for state and federal regulations’ (importance of skill: 4.9; quality of training: 3.7), ‘managing workplace violence programs (importance of skill: 4.3; quality of training: 3.2), ‘managing occupational health surveillance program’ (importance of skill: 4.3; quality of training: 3.3) and ‘assessing the health needs of worker populations’ (importance of skill: 4.8; quality of training: 3.9).

**Table 13.** Comparison of average ratings of the importance of the skills for the work as an occupational health nurse and the quality of the training received in those skills by the OEHN survey respondents.

	<b>Skills for the work as an Occupational Health Nurse</b>	<b>OEHN- Importance of the skills* (n=9)</b>	<b>OEHN alumni - Quality of the training received<sup>v</sup> (n=9)</b>
1	Assessing the health needs of worker populations	4.8	3.9
2	Analyzing risks associated with worksite hazards	4.6	4.0
3	Evaluating and managing ergonomic factors	3.9	3.9
4	Managing occupational health surveillance program	4.3	3.3



5	Conducting health and injury assessments	4.7	4.0
6	Managing sprains and strains	4.3	3.8
7	Managing workers compensation cases	4.2	3.6
8	Managing emergency preparedness plan	4.3	3.4
9	Managing workplace violence programs	4.3	3.2
10	Managing substance abuse programs	3.7	2.9
11	Managing travel health programs	3.7	3.0
12	Managing health promotion programs	3.8	3.4
13	Participating in health care quality improvement	4.0	3.3
14	Critically analyzing and evaluating scientific literature	4.1	4.7
15	Evidence-based practice	4.2	4.7
16	Clinical practice	4.8	4.0
17	Case management programs	3.6	2.9
18	Developing injury and illness prevention programs	4.0	3.4
19	Developing return to work programs	3.9	3.2
20	Program leadership and management	4.1	3.7
21	Program budget and finance skills	3.6	2.9
22	Communicating with management	4.4	3.7
23	Communicating with mid level management - supervisors	4.4	3.6
24	Communicating with colleagues	4.3	4.2
25	Communicating with workers, union reps, or the public	4.7	3.2
26	Technical writing	3.8	3.8
27	EH&S training for employees	4.0	3.2
28	Interpreting and applying for state and federal regulations	4.9	3.7

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\*Average of responses scored: not important (1), slightly important (2), moderately important (3), important (4), and very important (5).

∇ Average of responses scored: no training (1), limited training (2), good training (3), excellent training (4), and outstanding training (5).

### C. EHS/OSH Survey

As this survey was distributed to a wide range of disciplines, it did not seem feasible to ask equivalent questions about the importance of skills to individuals who represented a wide range of professions, industries, and sectors. Rather, we implemented a separate approach that targeted OM physicians in order to understand the current struggles and needs they felt were important to address in occupational health and safety. The following questions highlight the most prominent health disparities, areas for improvement, and views regarding the need for Eastern Medicine among OM professionals.

Occupational Medicine Residents were asked to list the three most significant health disparities that they encountered among their patient populations that related to sexual, ethnic or cultural characteristics. The table below (Table 14) lists these characteristics as captured by the survey’s open ended question. Common themes reported included factors associated with socioeconomic status including education level, race, ethnicity, language barriers and rural residency. Other themes included gender and access to care.

Table 14. Most significant health disparities encountered in practice.

<b>Answer 1 [open ended]</b>	<b>Answer 2 [open ended]</b>	<b>Answer 3 [open ended]</b>
Language	Education	Socioeconomic status
Access to healthcare	Lack of preventive care	-
Lack of primary care	Lack of access to medications	-
Language barriers	-	-
Race	Gender	Ethnicity
Education	Income	Belief system
Pay equity	Minority hiring	-
Socioeconomic status	-	-
Rural community	Education level	-
I do not see patients	-	-
Income	Race	Insurance coverage
Access to health	-	-
Racial	Gender	Language
Language	-	-
Culture	Beliefs	Intelligence
Educational background	Dietary Habits	Alcohol consumption
Socioeconomic status	Language	Multiple jobs
Cultural	Ethnic	Sexual
Gender pay	Ethnic barriers to health care	-

Ethnic	Sexual	Cultural
Language issues	Lack of health insurance	Company support
Lack of access to care	Language barriers	Lack of training in causation analysis of occupational disease
Education	Language	Employers
Lack of interest in improving Quality of care to BIPOC	Care for ESL	Clients in rural areas
Basic health literacy	Job types versus non ethnic job types	-
Obesity	Diabetes	Lack of knowledge about prevention
Hispanic patients not knowing their WC rights	Hispanic patients not wanting to return to work	Patients' access to care in WC system
Socioeconomic	Language	Citizenship status
Hispanic Workers	Healthcare Workers	-
Multicultural population	-	-
No access to a primary care provider	Knowledge about health care systems	-
Being African American	High obesity rate in hispanics	Poor trust in medicine

Occupational Medicine residents were asked to think about the areas of their practice where they are having the most difficulty and to list the first three CME topics they would like to see covered that would benefit their practice. Their recorded responses are in Table 15. Common themes included Covid-19 management and treatment, treatment of work-related musculoskeletal and other injuries, working with claims/insurance and office management.

**Table 15.** OMR topic preferences for improving their practice

<b>Answer Option 1</b>	<b>Answer Option 2</b>	<b>Answer Option 3</b>
Interpreting MRI reports (age normal vs pathology)	How to treat nonsurgical musculoskeletal ailments	Covid-19 management/ work disposition
Common work-related musculoskeletal injuries	Common work-place hazards	-
DOT exams	Chronic pain	Pre-existing conditions
Infectious disease	Occupational injuries	-
Regs	Current topics	-
Chemical toxicology	Covid-19 issues	Repetitive motion injuries
Obtaining appropriate and high-quality specialty-referrals	-	-
Getting adequately compensated for my clinical occupational health work	Funding for injury prevention programs	Funding for trained occupational health clinic staffing
Business management	Record keeping	Time management

Working with third party administrator (TPA)/workers compensation (WC) and getting feedback	Understanding what they look at to determine acceptance or denial of workers compensation claims	Managing history, exam, evaluation, and injury
Finding a new occupational health provider to join our practice	ACOEM Guidelines MTUS California	Chronic pain management
Delayed recovery	Dealing with Dept of Labor patients	Managing concussions
Covid-19 and research, training, development (RTD)	Nanotechnology exposure and control	-
Standard OM approach in leisure sector	Vaccination triage for Covid-19	On the job mental health methodologies
Electronic medical records, switching to EPIC	Treatment of musculoskeletal conditions	Psychiatric aspects of occupational medicine
Causation analysis with literature review	Office management for the solo doc	-
Post injury case management	Work relatedness of Covid-19	Addressing return to work decisions with other providers
Budget	Unions	Time management
Pain management	Radiology interpretation	Pandemic response
Patient safety	Total worker health	-
Keeping workforce healthy	Safety in the workplace	Covid-19 mitigation in the workplace
Communicating with specialists	Communicating with insurers	Communicating with patients
Masks	Case management	Exposure assessment
Workplace Violence	Covid-19	Chemical Exposures
Covid-19 diagnosis determination prior to testing	-	-
Support from admin	Support from union	-
Root cause analysis	Cost benefits of a program prevention	Epidemiology

More than half of physician respondents reported that they wanted to know more about Eastern Medicine and that incorporating techniques of Eastern Medicine would improve their ability to treat patients and/or improve patient outcomes, and assist patients on preventing injury or illness (Table 16). Eastern medicine focuses heavily on prevention (as well as treatment), mental health and untraditional forms of treatment such as acupuncture.

Table 16. Physician interest in Eastern Medicine Techniques

Areas	Yes (%)	No (%)
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<i>Would incorporating techniques of Eastern Medicine...</i>	N= 44	
Improve your ability to treat patients and/or improve patient outcomes for those who are already culturally disposed to eastern medicine	28 (63.6%)	16 (36.4%)
Improve your ability to treat patients and/or improve patient outcomes for those not yet disposed to eastern medicine?	25 (56.8%)	19 (43.2%)
Improve your ability to assist patients on preventing injury or illness?	24 (54.5%)	19 (43.2%)
I don't know enough about eastern medicine, but I want to know	26 (59.1%)	14 (31.8%)

#### **4. Occupational Epidemiology Skills and Professional needs**

During the past several years, the SCERC has provided research training in occupational epidemiology and in work organization through the Targeted Research Training (TRT) program. The Center anticipates that training in the affiliated disciplines, especially occupational epidemiology, will continue in the TRT Program even if it does not become separate academic training program within the SCERC. Therefore, the needs assessment survey asked public employers about the need for and importance of skills in the field of occupational epidemiology. The sampling frame of the public employers survey is described in Section 1 (page 4). In brief, a total of 2200 members were contacted through e-mail and 16 (1%) of them answered the survey. The respondents reported working in the following industry sectors: university or education organization (52.9%), other (25.5%), local public health department (17.7%), health care provider organization (11.8%), state public health department (5.9%), national occupational health or public health department (5.9%) and regulatory agency (5.9%, multiple responses allowed).

#### **Importance of Skills**

According to the public employers' responses, the first five skills ranked as most important for the job as an occupational epidemiologist were: communicating with department or organization leadership (4.6), draw appropriate inferences from epidemiologic data (4.5), exposure assessment for workplace hazards (4.5), health risk assessment (4.5), design and operate a surveillance system (4.3), communicating with workers and community (4.3, Table 17).

Table 17. Public employers rating of the importance\* of job skills for the work as Occupational Epidemiologist

	<b>Skills for the work as Occupational Epidemiologist</b>	<b>Average Rating*</b>
1	Draw appropriate inferences from epidemiologic data	4.5
2	Evaluate the strengths and limitations of epidemiologic reports	4.1
3	Identify key sources of data for epidemiologic purposes	4.3

4	Exposure assessment for workplace hazards	4.5
5	Health risk assessment	4.5
6	Describe a public health problem in terms of magnitude, person, time and place	3.9
7	Apply the basic terminology and definitions of epidemiology	3.8
8	Design and conduct an epidemiological study	3.6
9	Design and operate a surveillance system	4.3
10	Design and conduct an outbreak or cluster investigation	3.9
11	Select and conduct appropriate statistical analyses	3.9
12	Make reasonable inferences from statistical analysis	3.9
13	Deduce public health implications of research results	3.3
14	Make appropriate policy recommendations on the basis on research results and interpretation	3.9
15	Leadership and management	3.8
16	Communicating with department or organization leadership	4.6
17	Communicating with workers and community	4.3
18	Writing technical reports and summaries	4.1
19	Interpret and apply local, state, or federal regulations	4.1

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\*Likert scale includes: not at all important (1), of little importance (2), of average importance (3), very important (4), extremely important (5).

## 5. Continuing Education

Continuing Education is a core mission and program of the SCERC. Therefore, the needs assessment surveys asked each of the target populations about the topics the respondents thought were the most important to be available through Continuing Education.

### A. Employers

**Private Employers.** Few private employers responded to the survey and only 6 identified the importance of EH&S professionals participating in continuing education programs. Among those that did respond, they considered it important for occupational health nursing and safety professionals to participate in continuing education courses (Table 18).

Table 18. Private employers' importance of EH&S professionals participation in continuing education programs.

<b>Professional Area</b>	<b>Rating Average*</b>	<b>Response Count</b>
a. Industrial Hygiene (CIH)	2.4	6
b. Safety (CSP)	2.6	6
c. Ergonomics (CPE)	2.0	6
d. Occupational Health Nursing (COHN)	2.8	6
e. Occupational Medicine (OM board certified)	1.7	6

\*Answer options ranged from “not at all important” to “extremely important” on a 1-5 point Likert scale.

The survey also asked employers about the importance of topics for continuing education. The five topics ranked as the most important were: workers compensation (4.0), toxicology and health effects (4.0), infectious disease (4.0), personal protective equipment (3.8), return to work/stay at work accommodations (4.0, Table 19).

**Table 19.** Private employers’ rating of importance for continuing education topics.

<b>Topic</b>	<b>Average Rating* (n=33)</b>
1 Review of basic topics (e.g. incident investigation, walkthroughs)	3.2
2 Review courses for professional certification	3.4
3 Updates on laws, regulations, standards	3.6
4 Topics in indoor air quality, sampling and instrumentation, risk assessment	3.6
5 Chemical hazards	3.6
6 Physical hazards	3.6
7 Ergonomic hazards	3.6
8 Biological hazards	3.6
9 Machine safety and Mechanical hazards	3.6
10 Electric hazards	3.6
11 Personal Protective Equipment	3.8
12 Confined space	3.6
13 Emergency response	3.6
14 Risk assessment	3.6
15 Hazard communication	3.6
16 Hazardous materials	3.6

17	Infectious disease	4.0
18	Professional ethics	3.6
19	Safety science, Systems Safety	3.6
20	Toxicology and health effects	4.0
21	Epidemiology	3.4
22	Health surveillance	3.6
23	Emerging issues - nanotechnology, green chemistry, climate change, etc.	3.2
24	Business Management Skills (e.g. Risk Management, Risk Communication)	3.4
25	Accident investigation	3.6
26	Return to Work/Stay at Work Accommodations	3.8
27	Workers Compensation	4.0
28	Work Organization	3.6
29	Program evaluation	3.6
30	Total Worker Health	3.6
31	Psychosocial Factors in the Workplace and their Health Effects	3.8
32	Mental health	3.2
33	Productivity	3.4
34	Shift work	3.0
35	Bullying in the workplace	3.2
36	Workplace violence	3.4
37	Chronic pain management	3.6
38	Prevention and management of upper extremity disorders	3.8
39	Prevention and management of neck and shoulder disorders	3.8
40	Prevention and management of low back pain	3.8
41	Prevention and management of lower extremity disorders	3.8
42	Prevention and management of repetitive motion disorders	3.8
43	Patient Handling	2.8
44	Manual material handling	3.6

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\* Average of responses on Likert scale: not at all important (1), of little importance (2), of average importance (3), very important (4), and extremely important (5).



**Public Employers.** The five continuing education courses ranked as the most important were: risk assessment (4.2), emergency response (4.2), physical hazards (4.2), chemical hazards (4.2), updates on laws, regulations, standards (4.1), hazard communication (4.1, Table 20)

Table 20. Public employers rating of importance for continuing education topics.

	<b>Topic</b>	<b>Average Rating* (n=11)</b>
1	Review of basic topics (e.g. incident investigation, walkthroughs)	4.0
2	Review courses for professional certification	3.5
3	Updates on laws, regulations, standards	4.1
4	Topics in indoor air quality, sampling and instrumentation, risk assessment	3.8
5	Chemical hazards	4.2
6	Physical hazards	4.2
7	Ergonomic hazards	3.9
8	Biological hazards	3.9
9	Machine safety and Mechanical hazards	3.3
10	Electric hazards	3.6
11	Personal Protective Equipment	3.8
12	Confined space	4.0
13	Emergency response	4.2
14	Risk assessment	4.2
15	Hazard communication	4.1
16	Hazardous materials	3.9
17	Infectious disease	3.6
18	Professional ethics	3.8
19	Safety science, Systems Safety	3.6
20	Toxicology and health effects	3.6
21	Epidemiology	3.4
22	Health surveillance	3.6

23	Emerging issues - nanotechnology, green chemistry, climate change, etc.	3.5
24	Business Management Skills (e.g. Risk Management, Risk Communication)	3.7
25	Accident investigation	4.0
26	Return to Work/Stay at Work Accommodations	3.5
27	Workers Compensation	3.1
28	Work Organization	3.3
29	Program evaluation	3.4
30	Total Worker Health	3.2
31	Psychosocial Factors in the Workplace and their Health Effects	3.3
32	Mental health	3.3
33	Productivity	3.3
34	Shift work	3.2
35	Bullying in the workplace	3.0
36	Workplace violence	3.2
37	Chronic pain management	2.8
38	Prevention and management of upper extremity disorders	3.6
39	Prevention and management of neck and shoulder disorders	3.6
40	Prevention and management of low back pain	3.6
41	Prevention and management of lower extremity disorders	3.6
42	Prevention and management of repetitive motion disorders	3.5
43	Patient Handling	3.2
44	Manual material handling	3.3

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\* Average of responses on Likert scale: not at all important (1), of little importance (2), of average importance (3), very important (4), and extremely important (5).

## **B. Industrial Hygiene Professionals**

**IH Survey.** The continuing education courses ranked as the most important were: updates on laws/regulations/standards (4.4), business and Management Skills (e.g. Risk Management, Risk Communication) (4.2), emerging Issues - nanotechnology, green chemistry, climate change, etc. (4.1), ergonomic hazards (4.1), professional ethics (4.1, Table 21).

Table 21. IH survey respondents rating of importance for continuing education topics.

	<b>Topic</b>	<b>Average Rating* (n=20)</b>
1	Updates on laws/regulations/standards	4.4
2	Business and Management Skills (e.g. Risk Management, Risk Communication)	4.2
3	Emerging Issues - nanotechnology, green chemistry, climate change, etc.	4.1
4	Ergonomic hazards	4.1
5	Professional ethics	4.1
6	Topics in indoor air quality, sampling and instrumentation, risk assessment	4.0
7	Chemical hazards	4.0
8	Risk assessment	4.0
9	Physical hazards	4.0
10	Personal Protective Equipment	4.0
11	Toxicology and health effects	4.0
12	Review courses for professional certification	3.9
13	Machine safety and mechanical hazards	3.9
14	Hazardous materials	3.9
15	Confined space	3.9
16	Hazard communication	3.9
17	Return to Work/Stay at Work Accommodations	3.9
18	Safety Science, Systems safety	3.8
19	Total Worker Health	3.8
20	Electric hazards	3.8
21	Emergency response	3.8
22	Health surveillance	3.8
23	Program evaluation	3.8
24	Manual material handling	3.7
25	Biological hazards	3.7
26	Infectious disease	3.7

27	Accident investigation	3.7
28	Psychosocial Factors in the Workplace and their Health Effects	3.6
29	Prevention and management of repetitive motion disorders	3.6
30	Epidemiology	3.6
31	Workers Compensation	3.6
32	Work Organization	3.6
33	Prevention and management of upper extremity disorders	3.6
34	Prevention and management of low back pain	3.6
35	Prevention and management of neck and shoulder disorders	3.5
36	Prevention and management of lower extremity disorders	3.5
37	Workplace violence	3.5
38	Review of basic topics (e.g. incident investigation, walkthroughs)	3.4
39	Shift work	3.4
40	Mental health	3.3
41	Bullying in the workplace	3.3
42	Chronic pain management	3.2
43	Productivity	3.1
44	Patient Handling	2.7

\* Average of responses on Likert scale: not at all important (1), of little importance (2), of average importance (3), very important (4), and extremely important (5).

#### D. Occupational Health Nursing

The five continuing education courses ranked as the most important by respondents of the OEHN survey were: Infectious disease (5.0), patient handling (4.6), updates on laws, regulations, standards (4.6), prevention and management of low back pain (4.5), personal protective equipment (4.5, Table 22).

Table 22. CSAOHN\* members’ rating of importance for continuing education topics among those who had training in OHN at the master or doctoral degree level.

	<b>Topic</b>	<b>Average Rating** (n=8)</b>
1	Review of basic topics (e.g. incident investigation, walkthroughs)	4.1

2	Review courses for professional certification	4.4
3	Updates on laws, regulations, standards	4.6
4	Topics in indoor air quality, sampling and instrumentation, risk assessment	3.6
5	Chemical hazards	4.0
6	Physical hazards	4.1
7	Ergonomic hazards	4.1
8	Biological hazards	4.3
9	Machine safety and mechanical hazards	3.8
10	Electric hazards	3.8
11	Personal Protective Equipment	4.5
12	Confined space	3.8
13	Emergency response	5.0
14	Risk assessment	4.1
15	Hazard communication	3.9
16	Hazardous materials	4.0
17	Infectious disease	5.0
18	Professional ethics	4.0
19	Safety science, Systems Safety	3.8
20	Toxicology and health effects	3.9
21	Epidemiology	4.3
22	Health surveillance	4.1
23	Emerging issues - nanotechnology, green chemistry, climate change, etc.	3.8
24	Business Management Skills (e.g. Risk Management, Risk Communication)	3.9
25	Return to Work/Stay at Work Accommodations	4.1
26	Workers Compensation	4.0
27	Work Organization	3.8
28	Program evaluation	3.8
29	Total Worker Health	4.0
30	Psychosocial Factors in the Workplace and their Health Effects	4.3

31	Mental health	4.0
32	Productivity	3.8
33	Shift work	3.6
34	Bullying in the workplace	4.1
35	Workplace violence	4.1
36	Chronic pain management	4.3
37	Prevention and management of upper extremity disorders	4.3
38	Prevention and management of neck and shoulder disorders	4.3
39	Prevention and management of low back pain	4.5
40	Prevention and management of lower extremity disorders	4.1
41	Prevention and management of repetitive motion disorders	4.3
42	Patient Handling	4.6
43	Manual material handling	3.8

\*CSAOHN= California State Association of Occupational Health Nurses

\*\*Average of responses on Likert scale: not at all important (1), of little importance (2), of average importance (3), very important (4), and extremely important (5).

## E. Occupational Medicine Physicians

Continuing Education offered to occupational medicine physicians is considered to be Continuing Medical Education (CME), which requires formal accreditation. Both the SCERC and the UC Irvine Occupational Medicine Program are accredited to offer CME lectures and courses. The CME topics must be relevant to physicians, so the questions on CME asked of the occupational medicine physicians were somewhat different than those asked of the employers and other OH professionals.

Among all participants, 78.7% indicated that they required continuing education credits or units in order to keep their license current. When asked to indicate their need for additional training through continuing education, the following topics were reported as being in highest need: advanced health and safety topics (2.3) and laws/regulations/standards including updates (2.3, Table 23). When asked what type of learning format is most preferred for CME courses, respondents slightly preferred in-person courses (2.1) and courses held during the workday (1.9). For online formats, respondents preferred both asynchronous (1.9) and synchronous (1.9). Evening courses were least preferred (1.5, Table 24). Factors that were considered most important in deciding whether to take a CME course included content (67%) and professional accreditation (13%) and factors that were least important were number of days (0%) and reputation of CE provider (0%, Table 25).

Table 23. Need for training through CME courses

<b>CME Topics</b>	<b>Average Rating* N=92</b>
Review courses for professional certification	2.2
Laws/regulations/standards including updates	2.3
Emerging issues - nanotechnology, green chemistry, global warming, etc.	2.1
Advanced health and safety topics	2.3
Review of basic health and safety topics	1.8

\*Average of responses on a three-point Likert scale: low need (1), medium need (2), high need (3).

**Table 24.** CME course format preferences

<b>CME Format</b>	<b>Average Rating (N=83)</b>
Asynchronous (offline, at your own pace) learning only	1.9
Synchronous (live webinar) learning only	1.9
Hybrid (asynchronous and synchronous) learning	1.8
In person courses	2.1
Courses held during the workday (M-F, 9AM-5PM)	1.9
Courses held during the evening (5PM onwards)	1.5
Courses held on the weekends	1.8

\*Average of responses on a three-point Likert scale: neutral (1), prefer (2), highly prefer (3).

**Table 25.** Factors important in deciding whether to take a CME course

<b>Factors</b>	<b>Response Rate (N=91)</b>
Content	67.0%
Course faculty	3.3%
Professional accreditation	13.2%
Number of days	0%
Cost	7.7%
Reputation of CE provider	0%
If my employer will pay	5.5%
Location/travel	3.3%

## DISCUSSION

For the SCERC regional needs assessment survey, we developed questions regarding OH professionals' skills and competencies based on previous Needs Assessment Surveys conducted

by our center. We also collaborated with the SCERC program directors to incorporate questions about the quality of training and areas for improvement that could be asked of the program alumni. The range of OH professional skills and competencies was broad and encompassing. It should be noted that some skills and competencies might be more relevant to specific OH disciplines than others, so it is not surprising that some responses by the OH professionals and alumni indicated that some skills were not particularly important for their discipline. It is more important to focus on the respondents reporting of skills that are most important for their OH discipline.

## **Participant Response**

A total of 187 professionals in the occupational health and safety field answered the needs assessment survey. The response rate ranged from 1.36% (private and public employers) to 17.2% (EHS/OSH survey going to Occupational Medicine Residency alumni and WOEMA). The response rates were generally low, as is typical for online surveys with only email notices about the surveys. Additionally, as our survey was distributed during the Covid-19 pandemic, when we expect many OH professionals to be overwhelmed with pandemic preparedness and disease prevention tasks, we experienced lower response rates for our IH, OEHN, public and private employer surveys compared to previous years. In contrast, our survey administered to WOEMA had a higher response rate than the previous survey (17.2% vs. 3.5%, respectively). As alumni email addresses and CE contact emails were collected prior to distributing the survey, sometimes many years in advance, it is possible that the low response rate is a reflection of changes in employment and email over the years.

Challenges to developing sampling frames for private and public employers. It was difficult to obtain relevant and robust lists of EH&S managers for the present survey. We attempted to contact WestON for their list of public employers, but were unsuccessful in reaching them after multiple attempts. As such, we distributed these surveys to past participants of our CE courses and asked them to self-identify as either a public or private employer of EHS professionals. Thus, our sampling frame may not be representative of all EH&S employers. The EH&S managers for both the public and private employers tended to have at least master level training. However, these ES&H managers may not be able to report accurately on their employer's future hiring plans, especially for positions such as doctoral level OH professionals or OM physicians.

The smallest group of respondents was from the OEHN survey. This may be due to the smaller sampling frame used this year (CSAOHN members restricted to region IX), compared to previous years (using the entire national database of AAOHN members). One benefit of using this restricted sampling frame is that most respondents graduated from an OEHN/OHN academic program (64.3%). Similarly, half of all respondents reported having work experience in occupational health nursing after graduation.

The response rate was relatively high for our EHS/OSH survey (17.2%) and higher than in the 2016 survey (3.5%). There were a significant number of physicians who participated in the survey (53), with 33 having graduated from an OM residency. We believe the high response rate was due to the larger sampling frame used for this survey and that WOEMA members received a



dedicated email message from their professional organization asking them to participate in the survey.

### **CME Summary**

The greatest need for training through CME courses were on topics of laws/regulations/standards, including updates, advanced health and safety topics and review courses for professional certification. There was a slightly higher preference for in-person courses, though both synchronous and asynchronous online formats were popular among respondents. The most favored course time was during the work day (i.e., Monday to Friday, 9AM to 5PM). Weekend courses were also preferred but evening courses were not (after 5PM). When OM physicians were asked whether they would consider attending a 2-hour quarterly meeting for occupational medicine physicians, which would address a different topic each session, 89% selected 'yes' (table not shown). Among those who said yes, lunch and dinner meetings were preferred, while morning meetings were not unless they were online or linked with a meal in-person.

### **Regional Need**

According to the public employer survey, the likelihood that a private company will search for an occupational health professional by discipline in the next five years is moderately high for safety. In contrast, likelihood is moderate for industrial hygiene and fairly low for occupational and environmental epidemiology, occupational medicine, occupational health nursing and ergonomics.

The likelihood that a private employer will search for an occupational health professional (industrial hygiene, safety, ergonomics, occupational health nursing, occupational medicine, occupational epidemiology, and environmental epidemiology) during the next five years is moderately high for nursing, moderate for safety and industrial hygiene, and relatively low for occupational medicine, ergonomics, and environmental and occupational epidemiologists.

Private employers reported that hiring professional with formal training in the industrial hygiene, occupational health nursing, occupational medicine, occupational epidemiology, safety, environmental epidemiology, and ergonomics is of average importance. On the other hand, public employers think that formal training is very important for all disciplines.

These findings indicate that there is a clear need for additional training of OH professionals in each of the SCERC academic programs and for occupational epidemiology in the TRT and PPRT programs of the research training core. The employer respondents also emphasized the importance of the OH professionals having formal training and certification.

Overall, the SCERC needs assessment surveys of employers, OH professionals, and program alumni showed that there is a clear regional need for OH professionals who are formally trained and certified in the OH disciplines. The SCERC academic programs in Industrial Hygiene, Occupational and Environmental Health Nursing, and Occupational Medicine Residency are providing training that is highly appropriate for the future skills and competencies of OH

professionals in their discipline and the program alumni. The training by the programs are particularly strong in areas such as critical interpretation of the literature, study design and analysis. These findings reflect the strength of programs based in strong graduate programs of the two leading research universities of our SCERC.

Some areas of improvement were noted for each program as well. Based on responses from IH professionals and program alumni, it was noted that programs could provide more training in the areas of program leadership, management and communication. Specific deficiencies were noted for communicating with management, supervisors and union reps or the public. There was also a noted need for further training in finance and budget skills. The lowest score for the quality of training received during respondents' academic program was given for hazards associated with nanotechnology (score: 1.7). We have addressed this deficiency with the recent recruitment of a certified IH faculty who is currently developing an asynchronous CE course on this topic. Though hazardous waste management was given a lower score than other practical IH skills (score: 2.1), the IH Program Director, Dr. Que Hee, currently teaches a course on this topic once every two years. An R25 grant was recently submitted that, if funded, will allow the course to be offered annually.

Among OEHN professionals and alumni, areas of further training included communicating with workers, union reps or the public, workers compensation, as well as applying for state and federal regulations, and management of workplace violence and occupational health surveillance programs. There is currently a recorded course on worker's compensation provided in the OEHN program and we plan to transition this course to a webinar format so that it can be offered as CE. Training in case management programs was rated 2.9 (the lowest score); however, a chapter on disability management is required as part of the core OEHN curriculum that covers this topic extensively. OEHN program director, Dr. Robbins, and core OEHN Faculty, Dr. Thomas, will make an effort to discuss this chapter, and its relevant implications, in greater detail with students moving forward. Similarly, training in substance abuse was also given a score of 2.9 and we note here that the CE program addressed this gap in the past with a course on substance abuse. We understand that there is a continual need for training in this area and will work to have this course offered again through CE, likely as a webinar or asynchronous course.

Practicing OM physicians reported a desire for training in themes related to Covid-19 management, work-related injuries, management of insurance claims, general office duties, and finance. The SCERC faculty continue to discuss the optimum balance between providing training in the important skills and competencies expected of OH professional in the academic programs with the need to prepare for the long-term development of their careers as future program leaders. All programs plan to enhance training in program leadership, management and communication, while recognizing that there remains an important role for these skills to be addressed through the Continuing Education program.