
Barriers to Advanced Education for Occupational Health Nurses

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From a focus in the 1890s on home health care for employees and their families through an emphasis on providing emergency care for victims of traumatic accidents, the role of the occupational health nurse has greatly changed. Today, the scope of practice for the nurse still includes provisions for emergency services, but also encompasses the performance of health assessments; environmental surveillance and control; health education; wellness programs; counseling; management of health services; community relations; and special programs related to the needs of a particular firm or industry.

The type of occupational health program in which the nurse may be employed ranges from first aid services to sophisticated health care departments with full-time staffs of physicians, nurses, and technicians. In general, particularly in small plants, "the full-time registered nurse, more than any other health professional, is the predominant provider of health care" (NIOSH, 1980).

As the practice of occupational health nursing expands, so must the educational preparation. To develop the appropriate knowledge base, many occupational health nurses participate in continuing education activities, while others return to school for baccalaureate and master's degrees. However, several factors may serve as barriers to the occupational health nurse interested in returning to school. This article reports the results of a survey regarding perceived barriers to enrolling in a master's program in occupational health nursing. In addition, nurses'

interest in attending such a program, the types of roles for which the nurses would seek preparation, and employer support for educational advancement are described.

AN EXPANDING ROLE

Previously, basic nursing principles and an awareness of environmental hazards provided a sufficient knowledge base for the occupational health nurse. Today, the nurse must be well-prepared to anticipate problems in a number of areas: detect subtle changes in the environment before they pose serious hazards, provide leadership to correct or eliminate the problem, and develop prevention or treatment programs for employees.

Additionally, in the many settings in which the nurse is the only health care professional available for the majority of the time, the occupational health nurse must also have a thorough knowledge of the principles of industrial hygiene, toxicology, epidemiology, and safety. The occupational health nurse must be able to address problems arising from a variety of sources and identify and utilize resources from different disciplines.

Other topics with which the occupational health nurse must be familiar are the regulatory and legislative changes that affect the workplace. The numerous environmental regulations and standards currently in existence or under development must be incorporated. The nurse is often responsible for coordinating efforts toward compliance with these regulations, for developing programs and policies to ensure the health and safety of the worker, and for monitor-

ing the results of programs that have been initiated.

With the increasing societal and corporate interest in promoting health, the occupational health nurse often assumes responsibility for wellness or health promotion programs. Successful development of these programs requires knowledge of risk factors, strategies for changing behavior, principles of program planning and evaluation, and availability of community resources.

REVIEW OF PREVIOUS STUDIES

A number of studies have been conducted regarding the need for additional educational preparation for occupational health nurses. Most of the studies have focused on the need for, or the effect of, continuing education (CE) programs. Archer (1983) explored the impact of continuing education on occupational health nursing practice. The sample, chosen in two stages, consisted of a sampling of 50 of 153 constituent association presidents of the American Association of Occupational Health Nurses, and a listing of 557 members supplied by the presidents. Sixty-nine questionnaires (12%) were returned. Archer found significant positive relationships between years of experience in occupational health nursing practice and whether the nurse planned and implemented new programs.

Another survey of occupational health nurses regarding the impact of CE on practice was conducted by Connor (1983). The purpose of this study was to evaluate the impact of a series of CE programs in Georgia on

occupational health nurses. Questionnaires were sent to 93 occupational health nurses who had attended at least one of two programs in an occupational health nursing series and 186 potential supervisors and peers of the occupational health nurses. A total of 58 responses (21%) were returned. Most nurses from all three categories stated that the objectives of the CE programs were relevant to the job environment and work requirements, and that the series "somewhat" to "very much" affected their performance.

Bernhardt's (1980) survey of Wisconsin occupational health nurses found a high level of interest in attending CE programs and a preference for one-day workshops scheduled on Tuesday, Wednesday, or Thursday. Thirty-seven percent (73 out of 197) of those who did not have a bachelor's degree were interested in obtaining a baccalaureate degree in nursing. Out of a total sample of 258, 34 nurses expressed interest in obtaining a master's degree in nursing, but only 18 of these nurses had the prerequisite baccalaureate degree in nursing. For both undergraduate and graduate level education, nurses were interested only in part-time study. Specific barriers to attending school were not identified.

The American Association of Occupational Health Nurses (AAOHN) and Schering Corporation collaborated on a project to develop a descriptive profile of the occupational health nurse (Cox, 1985). Forty-nine percent of a random sample of AAOHN members completed the questionnaire. Respondents indicated that their management suggested and encouraged participation in academic and continuing activities, with 90 percent being compensated by management for continuing education programs.

These studies have documented occupational health nurses' interest in educational programs and reported employer support for their participation. Only the study by Bernhardt (1980) assessed interest in academic programs and the only potential barrier addressed in that study was the

level of enrollment. This present study assesses the interest, employer support, and barriers to entering academic programs.

METHOD

Sample

A systematic sampling (selection of every *K*th element in total list, Babie, 1973) of members of AAOHN constituent organizations in Michigan, Ohio, and Indiana was utilized. Of a total listing of 911 occupational health nurses in the three states, 400 members were systematically selected to receive questionnaires. Questionnaires were sent to 166 members in Michigan, 169 members in Ohio, and 65 members in Indiana.

Survey Instrument and Procedures

A questionnaire was developed to obtain information regarding educational and experiential background, place of employment, and perception of the need for and interest in enrolling in a master's program in occupational health nursing. Additionally, information was sought about their preferences for scheduling of a master's degree program, perceived barriers to attending such a program, and types of educational assistance available from employers. Content validity for the instrument was established through review by a panel of three master's-prepared nurses with expertise in occupational health nursing.

Questionnaires were mailed to the 400 occupational health nurses. Accompanying the questionnaire was a letter explaining the purpose of the study and assuring anonymity of responses, a form to request a copy of the survey findings, and a stamped, self-addressed envelope.

FINDINGS

A total of 204 questionnaires (51%) were returned. Ninety-six of the 204 respondents were from Michigan (47.3%), 83 were from Ohio (40.9%), and 24 from Indiana (11.8%). (Data regarding state were missing for one nurse.) Returns represented a 57.8% response rate from Michigan, a 49.1%

rate from Ohio, and a 36.9% rate from Indiana.

One hundred and thirty nurses worked in manufacturing companies (66.7%), while an additional 30 nurses worked in the transportation industry (15.4%). The remaining 35 nurses (17.9%) worked in various other industries (eg, services, government, and publishing). Employing companies varied in size, but 63% of the nurses worked in companies with more than 1,000 employees. Table 1 reflects the differences in size among the companies employing the nurses.

Almost all of the respondents were currently employed (95.6%), and the majority (87%) worked 40 hours per week or more. The nurses in the sample represented a mean length of experience in occupational health nursing of 12.3 years. Thirty-eight nurses reported 20 or more years of experience.

Table 2 describes the highest level of education attained by the nurses. The majority of the occupational health nurses (64.7%) were currently prepared at the associate degree or diploma level, and for 85.3% the first nursing preparation was at the associate degree or diploma level.

Significant differences in years of experience were found among nurses who had attained various levels of education. Nurses with a diploma, followed closely by those with a baccalaureate degree in another field, had the most years of experience in occupational health nursing (see Table 3).

Sixty-two of the nurses (31.2%) held some type of certification. Almost all of these nurses (93.2%) received certification status through the American Board for Occupational Health Nurses. Other certifying groups were the International Health Care Safety Organization, the American Nurses' Association, and Wayne State University.

NEED FOR A MASTER'S PROGRAM

Respondents perceived a need for a master's program in occupational health nursing in the region. In

response to the question, "How strongly do you feel that a master's program in occupational health nursing is needed in Michigan, Ohio, or Indiana?" a total of 166 nurses answered positively (82.2%), with 45 of these nurses reporting strong feelings (22.2%), and another 39 nurses reporting very strong feelings about the issue (19.3%). Although the program is not currently admitting students, a master's degree program for occupational health nurses had been in existence in southwest Ohio.

Responses about need varied by nurses' educational backgrounds. Nurses with a baccalaureate degree in another field were the most supportive of a need for a master's program in occupational health nursing (see Table 4). Using the Scheffe test, significant differences existed in two of the comparisons of groups, the associate degree (AD) nurses differed from the bachelor of science (BS) in another field ($p = .029$) and the diploma nurses differed from nurses with a bachelor of science in nursing (BSN) ($p = .006$) and with those having a BS in another field ($p = .00001$).

INTEREST IN A MASTER'S PROGRAM

As one might expect, a relationship exists between an individual's interest in attending a master's program in occupational health nursing and the perceived need for such a program. Nurses who were curious about a program or who planned to enroll in one at some point in the future were more likely to feel a need for the program ($p < .00001$).

Eighty-eight nurses (43.6%) expressed an interest in enrolling in an occupational health nursing program at the master's level. An additional 29 nurses (14.5%) indicated that they either had a master's degree already, felt that they were too old to consider returning to school, or identified other specific barriers to considering such a program. The remaining nurses were not interested in the program at the present time (42.1%).

As with the perceived need for the program, there were significant dif-

TABLE 1

Size of Companies Employing Survey Respondents

No. of Employees	No. of Companies	Percent of Companies
Less than 300	15	7.4
300-500	19	9.3
501-1000	37	18.1
1001-2500	40	19.6
2501-5000	47	23.0
Greater than 5000 employees	34	16.7
Missing data	12	5.9
	204	100.0

TABLE 2

Highest Level of Education Attained by Occupational Health Nurses

Highest Educational Credential	No. of Nurses	Percent of Nurses
Associate Degree	27	13.2
Diploma	105	51.5
Baccalaureate Degree in Nursing	26	12.8
Baccalaureate Degree in other field	35	17.2
Master's Degree in Nursing	5	2.4
Master's Degree in other field	6	2.9
	204	100.0

ferences in the level of interest the nurses expressed according to their educational background. Using the Scheffe test, significant differences existed in each of the comparisons of groups, with AD nurses differing from diploma ($p = .003$), BSN ($p = .05$), and master of science in nursing (MSN) and master of science (MS) ($p = .00001$). Diploma nurses differed from BSN ($p = .00001$), BS in another field ($p = .0001$), and MSN and MS ($p = .0001$). BSN nurses differed from MSN and MS ($p = .00001$), and BS in another field differed from MSN and MS ($p = .00001$) (see Table 5).

SUPPORT BY EMPLOYERS

For nurses enrolling in an occupa-

tional health nursing program, several sources of support were available from employers. The most frequent forms of support mentioned were full tuition offered by 80 employers (40.2%) and partial tuition offered by 74 employers (37.2%). Table 6 reflects the assistance that would be provided by the employers for nurses pursuing advanced preparation in occupational health nursing.

A number of factors would be considered by employers in the decision to offer support to nurses attending school. Relevance of the course or program to the nurse's current position was most frequently cited, identified by 115 nurses (60.2%). The second most frequently identified criterion was maintenance of continued

TABLE 3

Mean Years of Experience in Occupational Health Nursing by Highest Level of Education

Educational Level	Mean Years of Experience	Standard Deviation
Associate Degree	7.7	5.5
Diploma	14.2	7.5
Baccalaureate Degree in Nursing	10.3	7.4
Baccalaureate Degree in other field	13.5	9.4
Master's Degree in Nursing	5.5	5.3
Master's Degree in other field	7.4	3.7

TABLE 4

Analysis of Variance of Need for Master's Degree Program in Occupational Health Nursing by Highest Level of Education

Education	N	Mean	Standard Deviation
Associate Degree	25	3.00	1.58
Diploma	105	3.34	1.41
Baccalaureate Degree in Nursing	26	2.46	1.65
Baccalaureate Degree in other field	35	2.17	1.07
Master's Degree in Nursing or other field	11	2.55	1.81
Grand mean	202	2.94	1.50

Source	Degrees of Freedom	Mean Square	F*	P†
Between groups	4	11.37	5.52	.0003
Within groups	197		2.06	
Total	201			

*F=value.

†P=significance level.

Note. Need for Program Item: 1 = Very Strongly; 2 = Strongly; 3 = Moderately; 4 = Slightly; 5 = Indifferent; 6 = Not Needed.

These data did not meet all of the assumptions for analysis of variance, specifically equal variances between groups and similar cell sizes. However, it is likely that because of the size of the group of diploma nurses, their variance was reduced. A non-parametric analysis of variance, Kruskal-Wallis, was calculated and obtained essentially identical results.

PREFERENCES FOR A MASTER'S PROGRAM

Questions regarding preferences for the program and perceived barriers to the program were answered primarily by those who first indicated some interest in a master's program in occupational health nursing. Consequently, data for this section and the following one on perceived barriers reflect answers from fewer respondents (an *n* of 136 to 146 on those items).

A number of different roles were identified as ones for which the occupational health nurses would seek preparation. The most frequently identified role was that of administrator/director/supervisor. Sixty nurses selected this role, while 50 nurses selected nurse practitioner. Table 8 reports the role choices of all of the respondents. Since a number of nurses selected more than one role, the total exceeds 100%.

Scheduling preferences indicated that most of the nurses would like a part-time option for school (130 out of 136 nurses, or 95.6%), probably reflecting the nurses' needs to maintain employment at their work settings. A number of nurses expressed an interest in evening classes (70.8%) and weekend classes (52.8%). Fewer nurses chose days (16.7%) or summer classes (5.6%).

PERCEIVED BARRIERS TO SCHOOL

To determine what barriers exist for nurses interested in returning to school, a number of potential factors were identified from the literature and consultation with experts. The respondents were asked to rank each of these factors on a scale of 1 to 4 indicating the extent these factors would be a barrier to returning to school (1 = a small extent, 4 = a large extent).

The factor identified most frequently as a large barrier was the need to maintain income, identified by 94 nurses (64.4%). The second most frequently identified factor was the need to maintain fringe benefits, cited by 78 nurses (58.2%). Table 9 reports all of the factors and the

employment while in school, reported by 106 nurses (55.5%). Table 7 lists the perceived factors that

would be considered by employers in evaluating eligibility for educational support.

extent to which each was perceived as a barrier by the nurses.

DISCUSSION

The specialty of occupational health nursing faces a number of unique challenges. The need for an increasing number of well-prepared practitioners grows as a result of changes in the work place and the expanding roles of occupational health nurses. However, several factors have worked against a corresponding increase in the number of nurses returning to school. In this survey, more than 80% of the nurses felt there was a need for an additional master's degree program in a tri-state area, with almost 20% of the nurses feeling strongly about the need for such a program. Moreover, a number of nurses expressed an interest in attending such a program themselves. Occupational health nurses' beliefs in additional education is evidenced by the fact that more than 20% have obtained degrees beyond their original preparation at the associate degree or diploma level. The most preferred prospective role in occupational health nursing was administrator/director/supervisor.

This current survey, however, identified a number of barriers to returning to school. More than half of the nurses (55.5%) indicated that support from their employers would be, at least to some extent, dependent on their continuing employment. Related to the need to continue working were the need to maintain an income, cited by approximately 65% of the nurses, and the need to maintain fringe benefits, identified by almost 60% of the nurses. These barriers reflect some of the unique aspects of occupational health nursing that deter attainment of advanced educational preparation: a majority of occupational health nurses work alone in occupational health settings and, thus, can not take time off for classes; a majority of occupational health nurses have been prepared at the diploma level and would first need baccalaureate preparation; a relatively large percentage of occupational health nurses have been

TABLE 5

Analysis of Variance of Interest in an Occupational Health Nursing Master's Degree by Level of Education

Education	N	Mean	Standard Deviation
Associate Degree	25	3.28	.84
Diploma	89	3.67	.60
Baccalaureate Degree in Nursing	26	2.65	.89
Baccalaureate Degree in other field	31	2.68	.91
Grand mean	171	3.28	.87

Source of Variance	Degrees of Freedom	Mean Square	F*	P†
Between groups	3	11.76	21.06	.00001
Within groups	167	.56		
Total	170			

*F=value.

†P=significance level.

Note. Interest Item; 1 = Intend to enroll in next year; 2 = Intend to enroll sometime; 3 = Curious; 4 = Not interested.

These data did not meet all of the assumptions for analysis of variance, specifically equal variances between groups and similar cell sizes. However, it is likely that because of the size of the group of diploma nurses, their variance was reduced. A non-parametric analysis of variance, Kruskal-Wallis, was calculated and obtained essentially identical results.

TABLE 6

Types of Employer Support for Nurses Returning to School

Type of Support	No. of Nurses Reporting Company Support	Percent of Nurses Reporting Support
Full tuition	80	40.2
Partial tuition	74	37.2
Time off without pay	41	20.1
Leave of absence	40	20.1
Books	38	19.1
Time off with pay	12	6.0
Travel	8	4.0
Other assistance	8	4.0

Note. Respondents were asked to indicate all sources that were offered. Thus, totals exceed the n of 204 and 100%.

practicing for many years in the specialty and are not interested in pursuing additional formal education at

this point in their careers.

Consistent with data from a survey of corporation executives (Lusk,

TABLE 7

Criteria Considered in Employer's Decision to Offer Support

Criteria	No. of Nurses Reporting	Percent of Nurses Reporting
Relevance to current position	115	60.2
Continued employment while in school	106	55.5
Plan for future advancement	60	31.4
Length of educational program	57	29.8
Commitment to return to present employer	47	24.6
Seniority of employee	26	13.6
Other	14	7.3

Note. Respondents were asked to indicate all factors that would be considered. Therefore, totals exceed the n of 204 and 100%.

TABLE 8

Preferred Role Choices of Occupational Health Nurses

Nursing role	No. of Nurses	Percent of Nurses
Administrator/director/supervisor	60	41.4
Nurse practitioner	50	34.2
Consultant	42	28.8
Clinical nurse specialist	41	28.1
Educator	21	14.4
Other	5	3.4

Note. Respondents were asked to indicate all roles in which they were interested. Therefore, totals exceed the n of 204 and 100%.

1988), this survey of occupational health nurses indicates that employers do offer assistance in a variety of ways to nurses returning to school. More than 40% of the nurses reported that full tuition reimbursement was a benefit option. Only 18% of the nurses indicated that no form of assistance was available. However, given the constraints of the work setting, new strategies will need to be devised to enable occupational health nurses to return to school.

Based on identification of the particular barriers frequently cited, a crucial aspect would be to develop part-time program strategies that would enable nurses to continue

working. For many reasons, the respondents indicated that maintaining their jobs was important. Few nursing schools offer evening or weekend classes for nurses returning to school, however, part-time options are available in most graduate programs. While other nurses can rotate shifts to attend day classes, the occupational health nurse frequently does not have that option because many occupational health departments are open only during the day shift, or the nurse may be the only health care provider.

An additional strategy that could be explored would be the use of time-sharing by nurses who wish to return

to school. Two nurses sharing one position could provide coverage for the occupational health needs of the institution, and yet have sufficient time off for classes. Financial support would need to be made available, either by the employer or through loans or scholarships. The need for financial assistance is particularly acute for occupational health nurses, since they may have less flexibility for working alternative hours or in alternative settings to maintain their incomes.

Schools of nursing are offering options that can facilitate occupational health nurses earning master's degrees by occupational health nurses. Several schools have developed, and a number of schools plan to develop, an RN-to-master's degree program. These programs admit graduates of associate degree and diploma programs to a combined BSN and MSN degree program, resulting in greater efficiency and a shorter program, than if the BSN and MSN were earned in separate programs.

Another option, which often may not be readily apparent, is the special admission of occupational health nurses with baccalaureate degrees in fields other than nursing to master's degree programs in nursing. Although the school's catalog may state that a baccalaureate degree in nursing is required for admission, special admissions may be possible and worth exploring.

Perhaps of most importance is the need to educate employers about the relative benefits of employing occupational health nurses with advanced preparation. Understanding the long-term contribution that a well-prepared occupational health nurse can provide will increase the likelihood of employers providing the necessary short-term investment required to support the nurse during an educational program.

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ACKNOWLEDGMENT: This project was supported in part by the National Institute for Occupational Safety & Health, grant number 5T15-OH7027, awarded to The University of Michigan Center for Occupational Health & Safety Engineering.

Education IN SUMMARY

Barriers to Advanced Education for Occupational Health Nurses.
Lusk, S.L., Disch, J.M., Barkauskas, V.H. *AAOHN Journal* 1988;
36(11):457-463.

1. The expanding role of the occupational health nurse has increased the need for advanced education.
2. The largest barriers to enrolling in a master's degree program were the need to maintain income and fringe benefits.
3. The large majority of the employers offered some form of assistance for nurses returning to school, with full tuition the most frequently offered benefit.
4. The results suggest the need for part-time program planning because of the need many occupational health nurses have to maintain income, benefits, and employer educational support.

TABLE 9

Extent of Barriers to Attending a Master's Program in Occupational Health Nursing

Barriers	N	Percent of Respondents Indicating Extent of Barrier			
		Small 1	2	3	Large 4
Need to maintain income	146	13.0	8.9	13.7	64.4
Need to maintain fringe benefits	134	16.4	9.7	15.7	58.2
Distance from educational institution	132	9.8	9.1	24.2	56.8
Need to maintain seniority	129	29.5	10.1	16.3	44.2
Lack of necessary credentials	136	33.1	11.8	13.2	41.9
Lack of necessary prerequisites	120	22.5	18.3	20.0	39.2
Family responsibilities	136	30.9	18.4	14.0	36.8
Scheduling conflicts	131	13.0	23.7	28.2	35.1
Cost	134	27.6	29.9	17.2	25.4

Note. Figures in the body of the table refer to the percentage of nurses indicating to what extent the factor was a barrier.