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ORIGINAL RESEARCH

Patient Handling and Mobility Course Content: A National Survey of Nursing Programs

Findings indicate that evidence-based curricula in this area are urgently needed.

Health care workers who perform patient-handling tasks frequently incur musculoskeletal pain and injury as a result, with nurses and nursing assistants among those at highest risk.[1] This continues to be the case despite decades of focus on the body mechanics of patient handling; the availability of specialized equipment, staff training, and educational initiatives; as well as calls for safe patient handling and mobility (SPHM) efforts from agencies such as the Occupational Safety and Health Administration (OSHA).[2] (See *The Heavy Toll of Patient-Handling Injuries*.[1-6]) Numerous barriers prevent the widespread adoption and spread of SPHM programs in health care facilities, despite substantial evidence of their benefits. These barriers can include a safety culture that focuses primarily on patient safety, staff shortages, initial equipment costs, time constraints that keep nursing staff from obtaining assistance or using patient handling equipment, failures by health care leadership to advocate SPHM, difficulties in sustaining SPHM programs after implementation, and weak or nonexistent state and federal legislation regarding SPHM.[7]

We wanted to learn more about the prevalence of SPHM programs in U.S. nursing schools overall and what nursing curricula include with regard to SPHM content and resources. The short-term objective of this cross-sectional descriptive study was to understand what was being taught in nursing programs about lifting, turning, transferring, and repositioning patients.

BACKGROUND: THE EVIDENCE FOR SPHM

Definitions of terms. Early researchers applied principles from the field of ergonomics in an effort to reframe how health care workers think about handling and moving patients. The International Ergonomics Association defines *ergonomics* as "the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance."[8] The term *safe patient handling and mobility* refers to the application of ergonomics to lifting, transferring, repositioning, and mobilizing patients in order to prevent staff injuries and optimize patient mobility. From an ergonomics perspective, safe mobilization takes three aspects into account: the task to be performed (transferring a patient from a bed to a chair, for example), the mobility capabilities of the patient (such as whether a patient can stand with assistance), and any assistive technology used (such as a stand-assist lift).

Improved outcomes for health care workers. In 1999, the Veterans Health Administration (VHA) established a National Center for Patient Safety, and subsequently created four Patient Safety Centers of Inquiry (PSCIs).[9,10] Soon thereafter, researchers at the James A. Haley Veterans' Hospital PSCI in Tampa, Florida, were among the first to apply an ergonomics approach to patient handling. One expert panel identified priority areas for reducing nursing staff injuries associated with manual lifting by assessing the causes

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ABSTRACT

Purpose: Despite the evidence supporting safe patient handling and mobility (SPHM) practices, anecdotal evidence suggests that such practices are not universally taught in academic nursing programs. The primary goal of this cross-sectional descriptive study was to understand what nursing programs teach students about lifting, turning, transferring, repositioning, and mobilizing patients.

Methods: Faculty from baccalaureate and associate's degree nursing programs in the United States were invited via e-mail to complete a 64-item survey questionnaire, which was accessible through an online link. Participants were also invited to send documents related to SPHM course content to the research team.

Results: Faculty from 228 baccalaureate and associate's degree nursing programs completed the questionnaire. Most curricula included outdated manual techniques, taught reliance on body mechanics to reduce the risk of musculoskeletal injuries, and made use of nonergonomic aids such as draw sheets. Elements of SPHM in the curricula were less common, and nearly half of the respondents didn't know whether their affiliated clinical facilities had an SPHM program.

Conclusions: The survey results suggest many possibilities for improvement—such as partnering with faculty in physical and occupational therapy departments, clinical partnering, and working with equipment vendors—to better incorporate evidence-based SPHM principles and practices into nursing curricula.

Keywords: moving and lifting patients, nursing curriculum, nursing education, occupational safety, patient handling, safe patient handling and mobility

of injury and then redesigning high-risk patient transfer tasks.[11] Researchers then assessed the biomechanical loads of high-risk tasks in the laboratory,[12] and implemented a controlled demonstration project on 23 high-risk units in seven Department of Veterans Affairs facilities.[13] The demonstration project resulted in a significantly reduced rate of musculoskeletal injury and fewer modified workdays taken per injury.[13] The initial equipment investment was regained in less than four years, based on savings in workers' compensation costs and costs related to lost or modified workdays.[13] Researchers working outside the PSCIs have shown similar results. For example, in an Ohio study of nursing home workers, an investment in ergonomic equipment of $500 per worker was associated with a 21% reduction in back injury, and equipment costs were more than offset by reductions in compensation claims.[14]

There is strong evidence indicating that the implementation of multicomponent SPHM programs results in improved outcomes.[3, 15-17] For example, a three-year longitudinal evaluation of the VHA's nationally implemented SPHM program showed that from 2008 to 2011, the incidence rates of patient handling–related musculoskeletal disorders in nurses dropped markedly, with safe patient handling practices accounting for 23% of the reduction.[16] Another evaluation of the VHA's SPHM program by Hodgson and colleagues found that from 2006 to 2011, patient handling injuries declined by more than 40%.[18] Program components associated with decreased injury rates included peer leader training, peer leader effectiveness, equipment deployment, competency in equipment use, and safety committee involvement.[16, 18] The use of decision-making algorithms and policy changes were also factors.[18]

Based on such results, governmental agencies such as OSHA[19] and the National Institute for Occupational Safety and Health (NIOSH)[20] endorsed this systematic ergonomic approach for the prevention of musculoskeletal injuries among health care workers. To our knowledge, at the time of this writing, at least 11 states have promulgated SPHM-specific legislation.[7] In 2013, the American Nurses Association (ANA) published *Safe Patient Handling and Mobility: Interprofessional National Standards Across the Care Continuum*.[21] And with regard to professional education, beginning in 2004 a workgroup of ANA, NIOSH, and VHA experts designed curricular materials on safe patient handling, including ergonomics, for nursing schools; this curriculum module was subsequently published by NIOSH in 2009.[22, 23]

Improved patient outcomes. Besides reducing staff injuries, there is evidence that SPHM programs have played a role in improved patient outcomes, including improved mobility[24] and fewer complications of immobility.[25] Evidence supporting SPHM from a patient perspective has been persuasive to the Joint Commission, which is responsible for standard setting, evaluation, and accreditation of U.S. health care organizations. The Joint Commission now includes a chapter on patient safety systems in its hospital, ambulatory care, and office-based surgery program manuals.[26]

Yet most studies of SPHM programs have neither used strong research designs nor linked program components to outcomes. In 2006, de Castro and colleagues outlined the problem of patient handling injuries, highlighting the ANA's Handle with Care campaign, and issued a call to nurse administrators to advocate SPHM in health care.[27] Since then, while many organizations have implemented elements of SPHM programs, implementation of comprehensive SPHM programs throughout health care has been uneven.

SPHM curricula in nursing schools. Despite support for SPHM by the ANA and other professional organizations (including the American Physical Therapy Association and the Association of periOperative Registered Nurses[28,29]), anecdotal evidence suggests that SPHM has not been universally taught in academic health care programs and technical schools. According to Menzel and colleagues, barriers to SPHM curricula in nursing schools include opinion leaders objecting to change, traditional teaching of body mechanics, faculty resistance to adding introductory course content, faculty unfamiliarity with patient care ergonomics, a lack of SPHM equipment in clinical skills laboratories, outdated questions on the National Council Licensure Examination for Registered Nurses (NCLEX-RN) that emphasize manual handling, and the use of textbooks that don't include SPHM practices.[22] Indeed, textbook content is driven by NCLEX-RN questions, and while progress has been made, there is still reason for concern. For example, while Yoost and Crawford's *Fundamentals of Nursing* includes ergonomically based recommendations for the use of equipment when moving and transferring patients, it also includes photographs of nurses repositioning patients in bed using draw sheets.[30] The 2016 NCLEX-RN detailed test plan states that the test covers "use [of] ergonomic principles when providing care (e.g., safe patient handling, proper lifting)"[31]; similarly, the 2017 detailed test plan for the practical nurse version (NCLEX-PN) mentions "use [of] safe client handling techniques (e.g., body mechanics)" in the ergonomic principles section.[32] But it's unclear to what extent test items actually reflect this.

Our literature search yielded no evidence on the prevalence of SPHM coverage in U.S. nursing programs or what SPHM content and resources are included in nursing curricula. In evaluating the effects of the aforementioned NIOSH curriculum in 26 nursing schools, Nelson and colleagues found that nurse educators' and students' knowledge about SPHM equipment, as well as intention to use mechanical lifting devices in the near future, improved significantly at intervention schools.[33] A study by Powell-Cope and colleagues found that faculty were overwhelmingly positive about the NIOSH curriculum.[34] The researchers identified several implementation facilitators and recommendations for overcoming barriers, such as partnering with academic, clinical, and community colleagues; working with equipment vendors; using the curriculum module, which they

The Heavy Toll of Patient-Handling Injuries

Nurses and nursing assistants fare worse.

Health care workers who are responsible for manual patient handling, particularly nurses and nursing assistants, have among the highest rates of nonfatal occupational injuries requiring days away from work, according to the Bureau of Labor Statistics.[1] Indeed, in 2015, the incidence rate for these types of injuries among nursing assistants was 328 cases per 10,000 full-time workers, placing nursing assistants among the five occupations with the highest rates of such injury. This occupation was also among the top five regarding musculoskeletal disorders, including sprains, strains, and tears caused by overexertion when lifting, with an incidence rate of 171 cases per 10,000 full-time workers. Similarly, a report on data from 112 participating facilities in the Centers for Disease Control and Prevention's Occupational Health Safety Network found that rates of patient-handling injuries were highest among nurses and nursing assistants.[2] The researchers recommended targeted prevention strategies.

In addition to the human toll of such injuries, the performance of health care systems is adversely affected by the high costs associated with lost workdays, workers' compensation claims, and the training of replacement workers.[3-5] In a Canadian study of people with work-related musculoskeletal disorders who filed workers' compensation claims between 2010 and 2012, McLeod and colleagues used sequence analysis to describe postinjury work trajectories.[6] The researchers examined 81,062 claims and identified nine trajectory clusters based on return-to-work dates. Although workers with back strains were more likely to return to work within one month, those with other musculoskeletal disorders such as fractures and dislocations were much more likely to have prolonged absences. The quality of patient care may also be adversely affected, as when an injured worker isn't immediately replaced.[5]

characterized as structured yet flexible; and obtaining nursing school leadership support. Educational institutions could play a key role in achieving universal SPHM in all patient care settings by teaching SPHM knowledge and skills, expecting students to use SPHM in patient care, and reinforcing SPHM in clinical settings.

Study objectives. As noted earlier, the short-term objective of this study was to understand what was being taught in nursing programs about lifting, turning, transferring, and repositioning patients. More specifically, we sought to determine the extent to which SPHM content and resources were present in nursing program curricula, and to identify program characteristics associated with such presence. The long-term objective was to raise awareness of SPHM principles and practices in nursing academia so that they could be more fully integrated into the curricula.

METHODS

Study design. The study design was a cross-sectional descriptive survey of baccalaureate and associate's degree nursing programs in the United States. The survey was reviewed by the James A. Haley Veterans' Hospital Department of Research and Development. Since it was determined that the survey constituted an operations activity, institutional review board approval was not required.

Most nursing schools continue to rely heavily on manual handling content, despite evidence that manual handling increases a worker's risk of musculoskeletal disorders.

Sampling procedures. The sample consisted of faculty course coordinators and instructors for nursing fundamentals courses or courses in which SPHM was taught. Internet searches using Google, Wikipedia, and state boards of nursing websites were conducted to yield 2,196 unique baccalaureate and associate's degree programs of nursing. We located websites for 1,875 programs and used these to find e-mail and postal mail addresses and other contact information for nursing school leaders and administrators, who were asked to identify course coordinators or instructors as survey respondents.

Data collection instrument. The questionnaire, Patient Handling and Movement Course Content: A National Survey of Nursing Programs, was developed by the authors and is based on an instrument used in an earlier study.[33] Scales were developed by experts in the field to ensure content validity, and were pilot tested with a sample of five faculty. All scales had good to excellent internal reliability scores (above 0.70).

The online survey consisted of 64 items in six sections: screening (two items), curriculum (33 items), faculty role (two items), clinical facilities (four items), skills lab equipment (19 items), program characteristics (three items), and one open-ended item. The first two survey items were screens to ensure that the respondent was a faculty member and was either a nursing fundamentals course instructor or someone who had a role in determining fundamentals course content. If the respondent answered "no" to both items, a thank-you message would appear and the survey would close. The 33 curriculum items were subcategorized into content background, curriculum, manual handling content, SPHM content, student evaluation, teaching methods, and vendor support. Response choices were either "yes" or "no." Of these, three questions asked whether the respondent's school's curriculum was based on the NIOSH curriculum module, an evidence-based curriculum developed by that school, or the ANA's *Safe Patient Handling and Mobility* standards (or a combination thereof). Twenty items focused on curriculum content. These were subcategorized as background knowledge (two items addressed risk and mechanisms of musculoskeletal injuries), SPHM activities (11 items addressed elements such as ergonomic assessment protocols and use of SPHM equipment), and manual techniques (seven items addressed elements such as the use of gait belts, manual repositioning skills, and body mechanics). Two items addressed student evaluations, including competency evaluations and mastery of SPHM skills. Five items addressed teaching methods, including use of laboratories, case studies, computer-assisted or web-based instruction, and interprofessional teaching involving students from other health sciences. Three items addressed vendor support with regard to teaching students and loaning or donating equipment.

Two items addressed faculty role, asking about SPHM conference attendance and assistance with SPHM implementation at clinical teaching sites. Four items in the clinical facilities section asked about facilities that students visited during the fundamentals course. Specifically, these addressed the availability of SPHM resources (including ceiling-mounted and

Table 1. Frequency of SPHM Content in the Responding Nursing Programs (N = 228)

Content Area	'Yes' Responses n (%)
Background	
1. Mechanisms by which musculoskeletal injuries occur in nurses	210 (92.1)
2. Epidemiology and risk of musculoskeletal injuries in nursing	191 (83.8)
Curriculum	
3. Evidence-based curriculum	179 (78.5)
4. ANA SPHM interprofessional national standards content	156 (68.4)
5. NIOSH SPHM curriculum module	117 (51.3)
Manual handling	
6. Use of draw sheets for repositioning patients in bed	222 (97.4)
7. Body mechanics to reduce injury risk	221 (96.9)
8. Manually boosting, repositioning, and turning patients in bed	218 (95.6)
9. Manual assistance with standing, pivoting, transfers, and ambulation	218 (95.6)
10. Use of gait belts for standing, pivoting, transfers, and ambulation	215 (94.3)
11. One- and two-person (or more) manual lifts	195 (85.5)
12. Two-person manual lifts between bed and chair	191 (83.8)
SPHM	
13. Strategies for maintaining patient dignity	224 (98.2)
14. Nursing assessment of patient mobility	222 (97.4)
15. Use of patient handling equipment	216 (94.7)
16. Special considerations for special populations (for example, patients with spinal cord injuries)	164 (71.9)
17. Application and positioning of slings	120 (52.6)
18. How to inspect equipment (for example, checking slings for structural weaknesses)	133 (58.3)
19. Ergonomic assessment protocols	128 (56.1)
20. How to assess for and select sling types	120 (52.6)
21. Improved patient outcomes from SPHM	113 (49.6)
22. Working with physical therapists for use of SPHM equipment	97 (42.5)
23. Algorithms to assist students in decisions about equipment use	68 (29.8)
Student evaluations	
24. Competency evaluation in using equipment	131 (57.5)
25. A checklist to indicate the student's mastery of SPHM skills	105 (46.1)
Teaching methods	
26. Hands-on laboratory experience to practice using equipment	196 (86)
27. Computer-assisted instruction	121 (53.1)
28. Web-based teaching	79 (34.6)
29. Case studies in SPHM to stimulate critical thinking	96 (42.1)
30. Interprofessional learning with students from physical therapy, occupational therapy, medicine, or other departments	79 (34.6)
Vendor support	
31. Vendor support in donating equipment to our lab	16 (7)
32. Vendor support in teaching students	22 (9.6)
33. Vendor support in loaning equipment to our lab	16 (7)

ANA = American Nurses Association; NIOSH = National Institute for Occupational Safety and Health; SPHM = safe patient handling and mobility.

floor-based lift devices, a safe patient handling coordinator, and a comprehensive SPHM program) in affiliated clinical facilities. The 19 skills lab equipment items included definitions and pictures of different patient handling devices, among them five lateral transfer devices, three lifts, four powered movers, an electronic hospital bed, and an adjustable-height shower chair; and five non-SPHM devices, including gait or transfer belts, nonpowered stretchers, nonpowered adjustable beds, back belts, and draw sheets. Respondents were asked whether a specific device was present, and if it was, how many were available.

The program characteristics section contained three items about the college or university. The first question asked whether the school offered associate's degrees and baccalaureates in nursing. "Yes" responses prompted the respondent to estimate the number of graduates they had per year from each program. The second item asked whether the school was "private" or "public." If it was private, respondents were further prompted to note whether it was "for profit" or "not for profit." The last question asked whether the nursing program was part of an academic medical or health sciences center. If it was, the respondent was prompted to specify what other programs were available, including physical therapy, occupational therapy, medicine, and public health. The final survey question was open-ended and asked, "Is there anything else you would like to share with us about safe patient handling and mobility?"

Data collection procedures. An invitation was sent via e-mail or postal mail to the contact for each school of nursing in the database. This invitation explained the project and asked that the recipient forward the e-mail to the appropriate course coordinator or instructor. It also contained a link to the online survey, which was created using Qualtrics software (www.qualtrics.com) that has enhanced security features. Each invitation provided a unique survey access code, which allowed us to ensure there was only one respondent per program.

A statement noting that the survey was an operations activity and not research in the traditional sense was included in the invitation. The initial e-mail or letter further explained that results would be reported in the aggregate, no individual schools would be identified, and no personal health information would be requested. Project personnel contact information was provided, in case recipients had questions. Reminders to nonresponsive recipients were sent two and four weeks after the first invitation. After four weeks, follow-up phone calls were made to the appropriate contact people.

In addition to inviting survey participation, each invitation also asked the recipient to e-mail documents related to SPHM course content to the research team. These might include course outlines, bibliographies, recommended websites, and any other training materials or course documents. Potential participants were advised that completing the survey and sending documents were voluntary. Programs that returned a usable questionnaire were offered one 20% discount on registration for the 2015 or 2016 SPHM conference sponsored by the Tampa Veterans Administration Research and Education Foundation.

RESULTS

Sample. Of the 1,875 surveys sent out, 1,617 were delivered and 258 were undeliverable. After subtracting for nonresponses and returned questionnaires that didn't meet eligibility criteria, the final sample was 228, for a 14.1% response rate.

Of the respondents' colleges and universities, 118 (51.8%) offered an associate of arts in nursing degree and 79 (34.6%) offered a bachelor of science in nursing degree. Twelve schools (5.3%) offered both, and 19 (8.3) were missing or did not respond. One hundred forty-nine schools (65.4%) were public and 70 (30.7%) were private (nine participants did not respond). Of the 70 private schools, 28 (40%) were for-profit and 42 (60%) were not-for-profit. Thirty-one (13.6%) of the 228 schools were affiliated with a medical center. These included 11 with a public health program, 10 with a physical therapy program, nine with a medicine program, and nine with an occupational therapy program (4.8%, 4.4%, 3.9%, and 3.9% of the 228 schools, respectively). The state with the most respondents was Texas (30), followed by Missouri (13), and then California, New York, and Virginia (12 each). The states with no respondents were Alaska, Arkansas, Montana, and New Hampshire.

Only half of the responding schools taught the patient benefits of using safe patient handling and mobility equipment.

Survey results are presented by survey section: curriculum, faculty role, clinical facilities, and skills lab equipment.

Table 2. Features of the Clinical Facilities Affiliated with the Responding Nursing Programs (N = 228)

Features	None n (%)	Some n (%)	Most n (%)	All n (%)	Don't Know n (%)	No Response n (%)
Ceiling-mounted patient lifting devices	85 (37.3)	91 (39.9)	21 (9.2)	6 (2.6)	21 (9.2)	4 (1.8)
Floor-based patient lifting devices	15 (6.6)	38 (16.7)	74 (32.5)	93 (40.8)	5 (2.2)	3 (1.3)
A safe patient handling coordinator	54 (23.7)	29 (12.7)	19 (8.3)	15 (6.6)	108 (47.4)	3 (1.3)
A comprehensive SPHM program	35 (15.4)	46 (20.2)	26 (11.4)	16 (7)	101 (44.3)	4 (1.8)

SPHM = safe patient handling and mobility.

Curriculum. Thirty-three survey items, grouped into seven broad categories, measured curricular content and topics covered in nursing fundamentals programs (see Table 1). Manual handling topics were frequently covered. These included using draw sheets for repositioning patients in bed (97.4%); using body mechanics to reduce injury risk (96.9%); manually repositioning or turning patients in bed (95.6%); manually assisting patients with standing, pivoting, transfers, and ambulation (95.6%); using gait belts for standing, pivoting, transfers, and ambulation (94.3%); performing one- and two-person (or more) manual lifts (85.5%); and performing two-person manual lifts between bed and chair (83.8%).

Only three SPHM content topics—strategies for maintaining patient dignity (98.2%), assessing patient mobility (97.4%), and using patient handling equipment (94.7%)—were reported by 90% or more of the respondents. The content areas least frequently covered, according to respondents, were teaching methods and vendor support.

Faculty role. Of the respondents, 115 were nursing fundamentals course instructors and 113 had a role in determining such course content. Of the 115 fundamentals course instructors, 45 had assisted in implementing SPHM at clinical teaching sites; only eight had attended a national SPHM conference.

Clinical facilities. Survey respondents were asked whether there were ceiling-mounted patient lifting devices, floor-based patient lifting devices, a safe patient handling coordinator, and a comprehensive SPHM program in the clinical facilities students visited during nursing fundamentals courses (see Table 2). Of those responding, a majority reported that either none (37.3%) or some (39.9%) of their facilities had ceiling-mounted lifts; in contrast, all (40.8%) or most (32.5%) facilities reportedly had floor-based lifts. Many respondents didn't know whether their affiliated clinical facility had a safe patient handling coordinator (47.4%) or said it didn't have one (23.7%). In response to a question asking whether the affiliated facility had a comprehensive SPHM program—one that included equipment, policy, education, peer leaders, and champions—44.3% said they didn't know and 15.4% said there was no such program. Another 20.2% reported that their SPHM program had some of these components, 11.4% had most, and 7% had all of them.

Skills lab equipment. Respondents reported that the skills labs at their schools had a variety of equipment (see Table 3). The most common pieces of equipment were draw sheets (97.4%), electronic hospital beds (powered with electronic controls) (94.7%), gait or transfer belts (92.5%), nonpowered stretchers (76.8%), and lateral transfer sliding boards (69.7%). The least common pieces of equipment were adjustable-height shower chairs (1.3%), powered wheelchair movers (1.3%), and powered transport devices (0.4%).

DISCUSSION

To our knowledge, this is the first survey of U.S. nursing schools to evaluate the extent to which evidence-based SPHM content and resources were present in curricula. The results revealed that most schools continue to rely heavily on manual handling content, despite evidence that manual handling increases a worker's risk of musculoskeletal disorders. More than 90% of respondents indicated that curricula included the use of draw sheets for repositioning patients in bed, the use of body mechanics to reduce one's risk of injury; manual methods for repositioning or turning patients in bed; manual methods for assisting patients with standing, pivoting, transfers, and ambulation; and the use of gait belts for standing, pivoting, transfers, and ambulation. One- and two-person (or more) manual lifts and two-person manual lifts between bed and chair were also commonly taught. Only three SPHM content items—maintaining patient dignity, assessing patient mobility, and using patient handling

equipment—were among the top 10 most frequently covered topics.

The least frequently covered content areas were teaching methods and vendor support. Although the NIOSH SPHM curriculum for nursing schools was published in 2009,[23] only half the nursing programs in our study (51.3%) reported incorporating it into their nursing curricula. The use of an evidence-based curriculum is urgently needed if nursing programs are to educate students effectively on SPHM equipment and techniques.

It's worth noting that the NIOSH curriculum is almost 10 years old. While its implementation remains important and should be encouraged, there are opportunities for improvement. Several best practices have been identified that suggest specific areas for change. First, since vendor support in securing equipment has been identified as a best practice in implementation of the NIOSH curriculum,[34] nursing programs could partner with equipment manufacturers to obtain equipment loans. Although the skills labs at the respondents' facilities had a variety of equipment, the most commonly reported were those used for manual handling tasks, such as draw sheets, gait or transfer belts, and nonpowered stretchers. A majority of schools lacked ceiling-mounted and floor-based lifts and other friction-reducing devices. Nursing programs could also work more closely with vendors to lower equipment costs.

Second, collaborating with other departments such as physical therapy has been identified as a best practice in implementation of the NIOSH curriculum.[34] Nursing programs can look for opportunities to foster interdisciplinary collaboration among disciplines whose domains of practice include patient handling and mobility. In a survey of nursing and physical therapy students regarding their education in patient handling and mobility, the physical therapy students reported having more supervision when moving patients and being more assertive about adhering to safe practices than the nursing students.[35] In another study of first-year nursing students by McCrorie and colleagues, the researchers found that those students who received instruction in SPHM from fourth-year physical therapy students rated such peer teaching highly.[36] In that study, focus group themes included "enhanced communication and understanding" and "positive teaching experience," suggesting that peer teaching can be an effective method of teaching SPHM. Every discipline has much to contribute to joint educational efforts. Physical and occupational therapists bring their specialized knowledge of gait assessment and therapeutic techniques to improve mobility. Nurses and nursing assistants bring a holistic, "24/7" perspective to patient care, one that informs when and how different patient handling and mobility tasks are undertaken (for example, repositioning a patient for comfort, better visibility of skin for assessment or dressing changes).

Third, students bringing SPHM practices into their clinical settings and teaching others has been identified as a best practice in implementation of the NIOSH curriculum.[34] Our survey results indicated that SPHM wasn't widely incorporated into nursing practice at affiliated clinical facilities. Nursing programs should look for opportunities to coteach with such partners, as this can help drive the implementation of SPHM and SPHM-related practice changes in all clinical environments. For example, nursing faculty could provide nursing councils at clinical affiliates with briefs and presentations that cover the epidemiology and risk of patient handling injuries, explain the evidence base for SPHM, and describe ergonomics-based solutions for decreasing such risk. They could also present programmatic approaches to implementing SPHM, addressing elements such as program leadership, administrative support, initial and ongoing education, peer leadership, and technological support. If feasible, nursing schools might also

Table 3. Frequency of Skills Lab Equipment in the Responding Nursing Programs (N = 228)

Type of Equipment	Programs n (%)
Draw sheets	222 (97.4)
Electronic hospital beds	216 (94.7)
Gait or transfer belts	211 (92.5)
Nonpowered stretchers	175 (76.8)
Lateral transfer sliding boards	159 (69.7)
Floor-based lifts	114 (50)
Seated transfer sliding boards	93 (40.8)
Friction-reducing lateral sliding aids	82 (36)
Manual hospital beds (nonpowered, manual crank)	36 (15.8)
Back belts	36 (15.8)
Stand-assist lifts or aids	31 (13.6)
Mechanical lateral transfer aids	28 (12.3)
Ceiling-mounted lifts	26 (11.4)
Power-driven beds	25 (11)
Powered stretchers	25 (11)
Air-assisted lateral sliding aids	14 (6.1)
Adjustable-height shower chairs	3 (1.3)
Powered wheelchair movers	3 (1.3)
Powered transport devices	1 (0.4)

reconsider their affiliated clinical facilities in light of the strength of a facility's SPHM program and equipment availability.

Lastly, our finding that only half of the responding schools taught the patient benefits of using SPHM equipment was striking. It suggests there's a need for changing the way faculty think about and teach safety. SPHM is good for nurses because it helps prevent musculoskeletal injuries; and it's good for patients because it helps mobilize them, thereby preventing complications of immobility such as muscle weakness, falls, urinary stasis and urinary tract infections, pulmonary stasis and pneumonia, and pressure ulcers. Many of the same concepts apply to efforts to improve both health care worker safety and patient safety, including ergonomics, human factors, incident reporting, learning organizations, safe design, and safety culture. As the Joint Commission has stated, "Few activities in health care link patient and worker safety more directly than lifting, transferring, repositioning, and ambulating patients."[37]

Although our survey didn't assess barriers to SPHM implementation, our findings coupled with Menzel and colleagues' insights provide directions for improvement.[22] Menzel and colleagues found that nursing faculty were often unfamiliar with patient care ergonomics and relied on teaching traditional body mechanics using textbooks that emphasized body mechanics. Nursing faculty who teach nursing fundamentals courses could benefit from attending interdisciplinary SPHM conferences and webinars to refresh their knowledge and gain hands-on experience with SPHM equipment. If faculty members were aware that NCLEX examinations are beginning to include questions about ergonomics-based patient mobility, they might be more inclined to emphasize SPHM. Menzel and colleagues also found that opinion leaders who object to change may present significant barriers.[22] The literature on implementing evidence-based practice changes tells us that opinion leaders who are well respected and knowledgeable about a topic and can communicate persuasively are likely to effect change in others. For example, Elnitsky and colleagues found that hospital-based SPHM champions who demonstrated creativity, credibility, commitment, patience, persuasiveness, positive thinking, and tenacity, and who were skilled in clinical practice, leadership, problem solving, and understanding stakeholder perspectives, were likely to be successful in implementing SPHM.[38] Perhaps academic and clinical nurse leaders could recruit SPHM champions by directly appealing to their academic colleagues and to professional organizations, such as the International Nursing Association for Clinical Simulation and Learning. Faculty could also improve SPHM curricula by using case studies and developing computer-assisted instruction, web-based teaching methods, and simulation to stimulate critical thinking. (The National League for Nursing has specifically called for faculty to "purposefully integrate simulation into the curriculum with clear connections toward achievement of student learning outcomes."[39])

Limitations. The major limitation of this project was the low response rate, despite intensive outreach efforts and reminders. As this project was conceptualized as quality improvement, the results weren't intended to be, and may not be, generalizable.

CONCLUSIONS

This study found limited evidence for the incorporation of SPHM content into nursing curricula. Despite many years of research supporting SPHM, various quality improvement efforts in clinical settings, and the introduction of the NIOSH curriculum to nursing schools nearly a decade ago, patient handling injury rates have not substantially declined. Moreover, practices that put nurses at risk, such as the use of draw sheets for repositioning patients, are still found in nursing school curricula.

We found that nursing students' exposure to the principles of SPHM varied and was generally limited. While the majority of respondents reported using the ANA's SPHM interprofessional national standards in their curricula, they gave limited attention to the elements of evidence-based SPHM programs. Even when such elements were taught in classrooms, their practical application in skills labs was often lacking. Students' limited exposure to SPHM at clinical affiliates may be insufficient in guiding them to seek employment at facilities that best provide for their safety.

Nurse educators may find it challenging to add SPHM content to already full curricula. But schools have an ethical duty to protect students from known occupational risks such as the injuries associated with manually lifting, transferring, and repositioning patients and assisting them with mobility. Expectations of what the profession of nursing entails are first set in nursing school. It's incumbent on all nursing professionals to encourage and support schools to demonstrate commitment to SPHM as an essential standard of practice. ▼

For nine additional continuing nursing education activities on the topic of mobility, go to www.nursingcenter.com/ce.

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