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Original Research

The "Near-Peer" Approach to Teaching Musculoskeletal Physical Examination Skills Benefits Residents and Medical Students

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Abstract

Background: The musculoskeletal physical examination (MSK PE) is an essential part of medical student training, and it is best taught in a hands-on, longitudinal fashion. A barrier to this approach is faculty instructor availability. "Near-peer" teaching refers to physicians-in-training teaching their junior colleagues. It is unknown whether near-peer teaching is effective in teaching this important physical examination skill.
Objective: To investigate attitudes of medical students and physical medicine and rehabilitation (PM&R) residents regarding near-peer teaching in an MSK PE curriculum.
Design: Qualitative, anonymous paper and online surveys.
Setting: Tertiary academic center with a medical school and PM&R training program.
Participants: Ninety-nine second- and third-year medical students and 13 PM&R residents in their third or fourth postgraduate year.
Methods: Attitudes of second- and third-year medical students were measured immediately after their MSK PE course. Resident attitudes were measured in a single cross-sectional sample.
Main Outcome Measurements: Student attitudes were assessed via a questionnaire with 5-point Likert scales and a free-text comment section. The resident questionnaire included a combination of multiple-choice questions, rankings, free-text responses, and Likert scales.
Results: All 99 students completed the questionnaire. The majority of students (n = 79 [80%]) reported that resident involvement as hands-on instructors of examination skills was "very useful," and 87 (88%) indicated that resident-led small discussion groups were "very helpful" or "somewhat helpful." Fifty-seven of 99 students (58%) reported that the resident-facilitated course was "much better" than courses without resident involvement. Twelve of 13 eligible residents completed the survey, and of those, 8 found teaching "very helpful" to their MSK knowledge, and 11 became "somewhat" or "much more confident" in clinical examination skills.
Conclusions: Our study supports educational benefits to medical students and resident instructors in our MSK PE program. We recommend including near-peer teaching in medical student education, particularly for hands-on skills; we also recommend providing opportunities for PM&R residents to participate in formal near-peer education.

Background

The musculoskeletal physical examination (MSK PE) is an important part of medical student training, yet musculoskeletal education consistently is regarded as inadequate in medical school and postgraduate curricula [1-3]. Longitudinal integration of clinical MSK PE education into each year of medical education has been recommended to enhance skill mastery [4,5], and hands-on instruction is thought to be the most successful method of teaching MSK PE skills [4,6,7]. Ideally, the MSK PE is taught concurrently with various topically related basic and clinical science courses such as human anatomy and neurology [1,3,6]. Accordingly, in the United States, the Association of American Medical Colleges' Task Force on the Clinical Skills Education of Medical Students has mandated the longitudinal integration of hands-on training for the MSK PE [4].

Challenges to achieving these educational goals include staff time and human resources. A longitudinal, integrated educational model requires multiple MSK PE sessions spread out over each educational year, with increasing clinical relevance according to the students' level of understanding [3,4,6]. Each session should have a low student/teacher ratio to maximize hands-on instruction and individual assessment [4,7].

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In 2006, our medical school curriculum was modified to implement a longitudinal curriculum with more clinical content and clinical skills, particularly during the first 2 years of medical school (Appendix 1) [3]. The new musculoskeletal curriculum consists of multiple half-day sessions, including hands-on skills practice with a low student/teacher ratio. These sessions are spread throughout all 4 years of medical education (but predominantly occur in year 2). Each session is clinically focused and held concurrently with a related class topic such as human anatomy or musculoskeletal medicine. Sessions are facilitated by physical medicine and rehabilitation (PM&R) staff physicians, who are ideal MSK PE instructors because of their clinical focus on musculoskeletal and neurologic conditions [3-5].

Multiple yearly sessions with a low student/instructor ratio, however, require a significant time commitment from clinician teachers, who have increasing workload and productivity demands in the current medical reimbursement climate. At our institution, achieving a 4:1 student/teacher ratio would result in staff missing 30 clinical workdays per year for the department. To decrease the clinical time lost by staff physicians and to offer benefits of teaching to physicians-in-training, PM&R residents were recruited to help teach clinical skills to medical students (Appendix 1) [3].

The relationship between trainees and educators who are close in age and educational level is termed "near-peer teaching" [8]. Evidence suggests that near-peer teaching has a positive effect on both learners and educators. A systematic review of students (learners) who received near-peer teaching showed improved student confidence and better psychomotor and cognitive skills compared with standard educational practices [9]. Several authors have described largely positive subjective comments from students describing their clinical skills and professional attitudes after near-peer teaching sessions [8,10]. In addition, objective test scores of medical students performing general physical examinations showed no differences between students taught by faculty versus students taught by near-peers [11]. From the peer-educators' perspective, several noteworthy benefits have been affirmed, including improved clinical skills, increased confidence, improved communication skills, acquisition of practical teaching skills, and a deeper understanding of the educational topic of interest [8,12,13]. These benefits are beyond what a resident can achieve from additional exposure to educational material or from independent practice [14].

The goal of this study was to evaluate medical student and resident attitudes and opinions about near-peer teaching. We assessed student feedback regarding the curriculum before and after resident involvement. We evaluated student attitudes toward resident teaching. Finally, we surveyed residents about their perceptions of near-peer teaching and how teaching affected their clinical skills.

Methods

The study was approved by the Mayo Clinic Institutional Review Board.

Resident Teachers

Participating PM&R residents were recruited as volunteer teachers after a 15-minute descriptive presentation and a follow-up group e-mail. Eligible residents had to have completed at least 1 cycle of the 6-month didactic program, which consists of weekly, 3-hour sessions incorporating physical examination practice, ultrasound evaluation, case-based classroom lectures, and an annual physical examination test; thus, residents in postgraduate years (PGYs) 1 and 2 were excluded because of their relative inexperience. PGY 3 and 4 residents who were scheduled for inpatient rotations during the teaching sessions were excluded to avoid interfering with patient care. Eligible residents on outpatient rotations had their schedules revised to relieve them of clinical obligations. The residents were given access to the instructor's presentation slides ahead of the sessions, and they were able to observe any didactic portions of the courses before assisting in the sessions.

Medical Student Course Evaluations

An impetus for the curriculum change to include residents in teaching was feedback from students. For this study, we believed it would be helpful to retrospectively review student course evaluations and assess student feedback from the 5 years preceding the curriculum change. We thus reviewed standard, medical school—administered course evaluations from medical students who took the 2001-2006 PM&R MSK PE course without resident involvement. We specifically noted student comments regarding "hands-on" practice, student/teacher ratios, instructor qualification and effectiveness, and student confidence about performing an MSK PE. Representative comments from these evaluations (Table 1) provide context underlying the change in the curriculum.

We developed and administered a focused questionnaire to assess student attitudes toward resident participation in the MSK PE courses. The anonymous, paper-based questionnaire included directed questions with 5-point Likert scales and a free-text comment section. The questionnaire was administered to all medical students in their second and third (out of 4 years) of training during the 2011-2012 academic year, immediately after their participation in MSK PE courses taught by near peers (Appendix 2).

Resident Surveys

We assessed resident attitudes regarding their role as near-peer teachers, as well as the resident-teacher