Methodology for the Systematic Reviews on Occupation- and Activity-Based Intervention Related to Productive Aging

Marian Arbesman, Deborah Lieberman

Systematic reviews of the literature relevant to community-dwelling older adults are important to the practice of occupational therapy. We describe the four questions that served as the focus for the systematic reviews of the effectiveness of occupational therapy interventions for older adults living in the community. This article includes the background for the reviews; the process followed for each question, including search terms and search strategy; the databases searched; and the methods used to summarize and critically appraise the literature. The final number of articles included in each systematic review; a summary of the results; the strengths and limitations of the findings; and implications for practice, education, and research are presented.


Spurred on by the demands of payers, regulators, and consumers, occupational therapists and occupational therapy assistants, like many other health care professionals, increasingly have to demonstrate clinical effectiveness. In addition, they are eager to provide services that are client centered, supported by evidence, and delivered in an efficient and cost-effective manner. Over the past 20 years, the use of evidence-based practice (EBP) has been widely advocated as one approach to effective health care delivery.

Since 1998, the American Occupational Therapy Association (AOTA) has instituted a series of EBP projects to assist members in meeting the challenge of finding and reviewing the literature to identify evidence and, in turn, use those findings to inform practice (Lieberman & Scheer, 2002). Following the evidence-based philosophy of Sackett, Rosenberg, Muir Gray, Haynes, and Richardson (1996), AOTA’s projects are based on the principle that the EBP of occupational therapy relies on the integration of information from three sources: (1) clinical experience and reasoning, (2) preferences of clients and their families, and (3) findings from the best available research.

A major focus of AOTA’s EBP projects is an ongoing program of systematic review of multidisciplinary scientific literature, using focused questions and standardized procedures to identify practice-relevant evidence and discuss its implications for practice, education, and research. Systematic reviews of literature relevant to productive aging for community-dwelling older adults strengthen our understanding of the foundations of this important area of practice. It is imperative that occupational therapy practitioners, researchers, scientists, and educators have access to information that is up to date and of the highest quality.

According to Law and Baum (1998), evidence-based occupational therapy practice “uses research evidence together with clinical knowledge and reasoning to make decisions about interventions that are effective for a specific client”
(p. 131). An evidence-based perspective is founded on the assumption that scientific evidence of the effectiveness of occupational therapy intervention can be judged to be more or less strong and valid according to a hierarchy of research designs, an assessment of the quality of the research, or both. AOTA uses standards of evidence modeled on those developed in evidence-based medicine. This model standardizes and ranks the value of scientific evidence for biomedical practice using the grading system outlined in Table 1 (Sackett et al., 1996). In this system, the highest levels of evidence include systematic reviews of the literature, meta-analyses, and randomized controlled trials (RCTs). In RCTs, the outcomes of an intervention are compared with the outcomes of a control group, and participation in either group is allocated randomly.

The systematic reviews presented here include Level I RCTs; Level II studies, in which assignment to a treatment or control group is not randomized (cohort study); and Level III studies, which do not have a control group. Level IV studies, which have a single-case experimental design, sometimes reported for several participants, were included in one systematic review. Evidence tables summarizing the studies reviewed in each systematic review are available online at http://ajot.aotapress.net (navigate to the article, and click on “supplemental materials”).

This study was initiated and supported by AOTA as part of the EBP project. In 2005, the Ad Hoc Workgroup on Implementing Occupation-Based Practice recommended to the AOTA Board of Directors to “fund and disseminate the results of disciplinary and interdisciplinary research that supports the effectiveness of occupation based practice” (p. 6). As a result of the Ad Hoc Workgroup’s report, then-President Carolyn Baum’s report to the Representative Assembly included a motion to “charge the President to integrate an evidence-based literature review on the effectiveness of occupation- and activity-based intervention into the AOTA Evidence-Based Practice initiative” (Welch-Gillen, 2006, p. 9). To select an appropriate population for the review, AOTA staff and Marian Arbesman, EBP project consultant, reviewed the evidence-based literature reviews completed by 2008 and categorized them by the six practice areas identified in AOTA’s Centennial Vision: productive aging; children and youth; rehabilitation, disability, and participation; work and industry; mental health; and health and wellness. Input on the selection of a potential target population was requested from occupational therapy practitioners, researchers, and educators. In addition, AOTA and American Occupational Therapy Foundation staff were asked for input.

As a result of these discussions, the focus of the review was narrowed to the study of occupation- and activity-based interventions in community-dwelling older adults, and four focused questions were developed. The questions were generated in conjunction with a group of content experts in productive aging and EBP. The content experts included occupational therapy practitioners, researchers, and educators in this area.

The four focused questions included in the review were as follows:

1. What is the evidence that participation in occupation and activities supports the health of community-dwelling older adults?
2. What is the evidence for the effect of occupation- and activity-based interventions on the performance of selected instrumental activities of daily living (IADLs) for community-dwelling older adults?
3. What is the evidence for the effect of occupation- and activity-based health management and maintenance interventions on the performance of community-dwelling older adults?
4. What is the evidence for the effect of home modification and fall prevention interventions and programs on the performance of community-dwelling older adults?

Method

Databases and sites searched included Medline, PsycInfo, CINAHL, AgeLine, and OTseeker. In addition, consolidated information sources, such as the Cochrane Database of Systematic Reviews and the Campbell Collaboration, were included in the search. These databases are peer-reviewed summaries of journal articles and

Table 1. Levels of Evidence for Occupational Therapy Outcomes Research

<table>
<thead>
<tr>
<th>Levels of Evidence</th>
<th>Definitions</th>
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<tr>
<td>Level I</td>
<td>Systematic reviews, meta-analyses, randomized controlled trials</td>
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<tr>
<td>Level II</td>
<td>Two groups, nonrandomized studies (e.g., cohort, case-control)</td>
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<tr>
<td>Level III</td>
<td>One group, nonrandomized (e.g., before and after, pretest and posttest)</td>
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<tr>
<td>Level IV</td>
<td>Descriptive studies that include analysis of outcomes (e.g., single-subject design, case series)</td>
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<tr>
<td>Level V</td>
<td>Case reports and expert opinion that include narrative literature reviews and consensus statements</td>
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provide a system for clinicians and scientists to conduct evidence-based reviews of selected clinical questions and topics. Moreover, reference lists from articles included in the systematic reviews were examined for additional potentially relevant articles, and selected journals were hand searched to ensure that all appropriate articles were included. Search terms for the reviews were developed by Marian Arbesman and AOTA staff in consultation with the authors of each systematic review and then reviewed by the Evidence-Based Practice Project consultant. The search terms were developed not only to capture pertinent articles but also to make sure that the terms relevant to the specific thesaurus of each database were included. Table 2 lists the search terms related to population and intervention included in each systematic review. A medical research librarian with experience in completing systematic review searches conducted all searches and confirmed and improved the search strategies. In addition, a filter based on one developed by McMaster University was used to narrow the search to research studies (Edward G. Miner Library, n.d.).

Included in the reviews were 5,021 citations and abstracts. Question 1 yielded 1,555 citations and abstracts, Question 2 yielded 1,830, Question 3 yielded 808, and Question 4 yielded 828. The Evidence-Based Practice

<table>
<thead>
<tr>
<th>Category</th>
<th>Key Search Terms</th>
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<tbody>
<tr>
<td>Population</td>
<td>Aged (includes ages 80 and older and frail elderly), aging, aged (80 and older), 65+, gerontology, frail elderly</td>
</tr>
<tr>
<td>Occupation and health</td>
<td>Healthy aging, productive aging, successful aging, activity participation, activity patterns, work, job satisfaction, retirement, employment, postretirement work, reemployment, volunteerism, voluntary workers, volunteer experiences, volunteer services, activism, leisure, leisure time, leisure activities, hobbies, holidays, recreation, social participation, friends, friendship, interpersonal relations, family, intergenerational relations, grandparents, grandparent as parents, peer group, social support, community involvement, involvement, lifestyle, daily activities, activities of daily living, physical mobility, mobility aids, toileting, bowel and bladder management, instrumental activities of daily living, financial management, financial strain, economic security, economic resources, caregivers, caregiver burden, elder care, child rearing, automobile driving, highway safety, automobiles, education, adult education, learning (in adulthood), education (continuing), sleep, relaxation, relaxation techniques, relaxation therapy, rest, work rest cycles, habits, walking, pedestrians, health promotion, health education, health behavior, healthy attitudes, preventive medicine, patient education, food preparation, diet, nutrition education, weight control, smoking cessation programs, tobacco use cessation, diet, menu planning, exercise, physical activity, physical fitness, therapeutic exercise, bicycling, sports, yoga, tai chi, exercise movement techniques, hydrotherapy, swimming, early ambulation, sexual behavior, psychosocial behavior, urinary incontinence, constipation, pets, bonding (human–pet), communication, communication skills, communication skills training, communication aids for the disabled, religion, religiosity, religious practices, religious activities, religious service attendance, spirituality, spiritual well being, rehabilitation (psychosocial), psychosocial rehabilitation, disease management, treatment compliance</td>
</tr>
<tr>
<td>Instrumental activities of daily living</td>
<td>Instrumental activities of daily living, activities of daily living, activity participation, instrumental activities, home maintenance, household management, household maintenance, housekeeping, home management, shopping, cooking, food preparation, menu planning, driving, automobile driving, highway safety, bicycles, bicycling, walking, pedestrians, habits, pets, bonding (human–pet), child rearing, grandparents, caregivers, caregiver burden, elder care, financial strain, economic security, financial management, financial skills, money management, habits, emergency medical service communication services, security measures (electronic), equipment alarm systems, alarm systems, safety devices, household security, safety, assistive technology, assistive devices, assistive devices and communication, communication, communication aids for the disabled, communication assistive devices, communication devices, communication skills training, optical aids, eyeglasses lenses, hearing aids, religion, religion and religions, activities, religious service attendance, religiosity, spirituality, spiritual well being, healthy aging, productive aging, successful aging, wellness programs</td>
</tr>
<tr>
<td>Health management</td>
<td>Health promotion, health education, health behavior (includes patient compliance, self-examination, and treatment refusal), health management, health maintenance, patient education, client education, disease management, lifestyle, health behavior, healthy attitudes, diet, nutrition education/aging, weight control, diets, dental health education, diet therapy, menu planning, diabetic diet, tobacco use cessation, smoking cessation, substance-related disorders, substance dependence, drug rehabilitation, relapse, drug use, alcoholism, rehabilitation (psychosocial), psychosocial rehabilitation, exercise, therapeutic exercise, yoga, tai chi, physical activity, physical fitness, exercise movement techniques, bicycling, exercise adherence, strength training, hydrotherapy, swimming, sports, activity participation, activity patterns, habits, rigidity (habit rigidity) sleep, relaxation, relaxation therapy, rest</td>
</tr>
<tr>
<td>Fall prevention and home modification</td>
<td>Falls, accidental falls, accidents (home), home accident, accident proneness, home accidents, fractures, hip injuries, fear of falling, fall prevention, accident prevention, architectural accessibility, aging in place, independent living, naturally occurring retirement communities, community-dwelling, home safety, home environment, home evaluation, home assessment, environmental modifications, environmental interventions, environmental hazards, housing adaptation, environmental barriers, environmental design, universal design, person environment fit, housing for the elderly, home maintenance, home modification, housing improvement, assisted living facilities, retirement communities, retirement housing, homes for the aged, interior design, interior design and furnishings, furnishings, floor and floor coverings, activities of daily living, instrumental activities of daily living, occupational performance, personal care, self-care skills, self-help devices, hip protectors, equipment design, assistive technology, adaptive equipment</td>
</tr>
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</table>
Project consultant completed the first step of eliminating citations on the basis of citation and abstract. Review authors and their team of students completed the next steps of eliminating citations, also on the basis of citation and abstract. The full-text versions of potential articles were retrieved. Then the review teams determined final inclusion in the review on the basis of predetermined inclusion and exclusion criteria, which were critical to providing a structure for the quality, type, and years of publication of the literature incorporated into the reviews. The review of all four questions was limited to the peer-reviewed scientific literature published in English. Literature published in Spanish was also included in the review for Question 2. The review also included consolidated information sources such as the Cochrane Collaboration.

Except as described here, the literature included in the review was published between 1990 and October 2008. Selected articles published in 2009–2011 were recommended by experts in the field and included in the review. All studies in the review included interventions that were within the scope of occupational therapy practice (AOTA, 2010). Participants for studies in the review were community-dwelling older adults and included those living at home or with family, in retirement communities, and in assisted living facilities. Except for one Level IV study included in the review for Question 2, all studies incorporated in the reviews provided Level I, II, and III evidence.

The review excluded data from presentations, conference proceedings, non–peer-reviewed research literature, research reports, dissertations, and theses. In addition, studies of participants in hospitals, skilled nursing facilities, and hospice were excluded from the review because they were not considered to be community-dwelling older adults. Also excluded from the review were studies of older adults with major diagnoses such as stroke, dementia, and Parkinson’s disease. Level IV and V evidence, as well as studies outside the scope of occupational therapy practice, were also excluded. Procedures specific to each question are described in the text that follows.

The systematic review for Question 1 was structured slightly differently from the other questions. The question examined how occupation and activities can affect a variety of outcomes related to health (e.g., mortality, depression, dementia, institutionalization). The studies included in the review were longitudinal studies, primarily large follow-up studies of older adults. One-time surveys of older adults that examined the relationship between occupation and health were not included in the review because they lacked the longitudinal perspective that strengthens the ability to determine potential causation.

For Question 3, a second search was performed (through November 2010) to include articles more current than those published by October 2008. A total of 187 citations and abstracts were found and reviewed, resulting in 193 articles in the final review.

Table 3 presents the number and level of evidence of articles included for each review question. The teams working on each focused question reviewed the articles according to their quality and levels of evidence. Each article included in the review was then abstracted using an evidence table that provides a summary of the methods and findings of the article and an appraisal of the strengths and weaknesses of the study on the basis of design and methodology. Review authors also completed a Critically Appraised Topic (CAT), a summary and appraisal of the key findings, clinical bottom line, and implications for occupational therapy of the articles included in the review for each question. AOTA staff and the Evidence-Based Practice Project consultant reviewed the evidence tables and CATs to ensure quality control.

**Summary**

The results of the systematic reviews published in this issue of the *American Journal of Occupational Therapy* provide important information for practitioners working with older adults. By reviewing the scientific literature broadly and appraising and synthesizing specific studies, the authors of the reviews have been able to provide up-to-date answers to critical questions that may previously have been informed only by clinical expertise. Readers are encouraged to examine all four systematic reviews included in this special issue for a complete summary of the results of each focused question.

The systematic review of the relationship of occupation and health found evidence for the impact of physical

### Table 3. Number of Articles by Level of Evidence for Each Review Question

<table>
<thead>
<tr>
<th>Review Question</th>
<th>Level I</th>
<th>Level II</th>
<th>Level III</th>
<th>Level IV</th>
<th>Total for Each Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Occupation and health</td>
<td>9</td>
<td>95</td>
<td>0</td>
<td>0</td>
<td>98</td>
</tr>
<tr>
<td>2. Instrumental activities of daily living</td>
<td>31</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>38</td>
</tr>
<tr>
<td>3. Health management</td>
<td>24</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>28</td>
</tr>
<tr>
<td>4. Fall prevention and home modification</td>
<td>31</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>Total</td>
<td>89</td>
<td>103</td>
<td>4</td>
<td>1</td>
<td>197</td>
</tr>
</tbody>
</table>
activity, social participation, religious participation, work and volunteering, caregiving, sleep, and participation in leisure and cognitive activity (e.g., reading, writing, doing word games or puzzles, attending lectures) on various indicators of health for older adults. Results of multiple longitudinal studies indicated that greater participation in physical and general activities resulted in reduced mortality. In addition, older adults who were more physically active and involved in more productive roles had higher functioning and reduced levels of ADL and IADL dependence.

Longitudinal studies of social participation in older adults have indicated that the presence of social supports and larger social networks were predictive of survival. In addition, studies have found that a strong social network over time results in less physical and cognitive decline and better quality of life. People who engage in more leisure and cognitive activities during aging may demonstrate a reduced risk for the development of dementia. However, the evidence that those who participate in leisure activities have fewer medical comorbidities is limited.

Although the definition of participation in religious activities varied among the studies included in the systematic review, the evidence indicated that participation in religious activities was predictive of lower mortality and improved mental health. In the area of caregiving, limited evidence exists that aspects of caregiving, such as restriction in engagement in personal activities because of caregiving, are associated with increased use of long-term care services. In addition, limited evidence indicates that living in a home with grandchildren under highly stressful situations has a negative impact on the health and health behaviors of grandparents. In the area of sleep, the evidence that women sleeping <6 hr or >7.5 hr per night report more functional limitations is limited. Evidence has also shown that daytime sleepiness may be related to decreased functional status and increased mortality.

Studies examining the effectiveness of IADL interventions have found moderate evidence that client-centered and task-specific occupational therapy interventions improve IADL performance in adults with chronic conditions. Some evidence, with small sample sizes, has indicated that short-term occupational therapy improves IADL performance of frail older adults living in the community. Evidence that environmental modification maintains IADL performance and prevents future IADL limitations in adults living in the community is limited.

There is moderate evidence that progressive-resistance strength training and physical activity programs targeting specific areas of IADLs, such as household activities, result in improved IADL performance. The evidence that cognitive and vision rehabilitation improves IADL performance is limited but positive. Also limited is the evidence that interventions such as simulator-based driver training, physical activity interventions, and driver education programs improve older adults’ driving skills.

In the area of health management and maintenance, the evidence for the effectiveness of programs that include face-to-face encounters when addressing health routines is stronger than that for programs without that component. The evidence is strong for programs that have a client-centered focus, in which interventions are developed on the basis of the participants’ individual needs and preferences. The use of culturally or linguistically relevant self-management programs is also supported, and evidence has indicated that these programs enhance health behaviors and health status.

In the area of fall prevention and home modification, the strongest evidence is that the multifactorial approach is effective for a wide range of outcomes. In multifactorial interventions, occupational therapy practitioners work with other disciplines to provide a wide range of interventions that may include home modifications or hazard reduction, exercise, education, medication review, and vision screening. The results for physical activity programs alone, such as balance retraining, walking, lower-extremity strengthening, tai chi, and general exercise in sitting and standing, are moderate. The strongest evidence appears to be for those participants with either a history of falling or decreased functional performance. The evidence for home modification programs provided individually is also moderate, and evidence has shown that adherence to recommendations for modifications was significantly higher for those seen by occupational therapists than for those seen by nonprofessionals.

Strengths and Limitations of the Review

The systematic reviews presented in this issue cover many aspects of occupational therapy practice for community-dwelling older adults and have several strengths. The four reviews each included a focused question covering information on various aspects of the Occupational Therapy Practice Framework: Domain and Process (2nd ed.; AOTA, 2008). The reviews included 197 articles; 45% \(n = 89\) were Level I evidence, and 97% \(n = 192\) were Level I and II evidence. The reviews involved systematic methodologies and incorporated quality control measures.

Limitations of selected studies incorporated in the reviews include small sample size, lack of blinding, wide variation of interventions included in reviews, high rates of attrition during follow-up, and use of imprecise or outdated measures. Depending on the level of evidence, a lack
of randomization, lack of control group, and limited statistical reporting may have occurred. Some studies were conducted in simulated settings, and generalizing the findings to real-life daily activities may be difficult. Separating the effects of a single intervention that is part of a multifactorial intervention may also be difficult. Studies included in the fall prevention and home modification review had different or unreported definitions of falls. The meta-analyses and systematic reviews incorporated in these reviews may have included a wide range of diagnoses and clinical conditions.

Implications for Occupational Therapy Practice, Research, and Education

The systematic reviews presented in this issue provide an appraisal of the scientific literature to answer the focused questions of relevance to occupational therapy practice. The results described here can be directly integrated into clinical practice by combining the scientific evidence with clinical expertise and client preferences. In addition, practitioners may use this information when advocating for occupational therapy services with external audiences such as regulators or payers or providing information and support to a client and family member at any point during the intervention process.

Strategies for the future are that researchers should build on the existing studies discussed in the systematic reviews included in this issue. Whenever one is engaging in clinical research, one needs to be familiar with the most recent research to incorporate it into future research plans. Although the systematic reviews show many benefits of occupation- and activity-based approaches to treatment, more work is needed to definitively answer the four questions included in this project for their direct applicability to occupational therapy practice because most of the studies were not performed within that discipline. Conversely, whereas some future research can be conducted in isolation, research questions in the areas of productive aging are often complex and may best be answered through collaborative research between occupational therapy and other disciplines such as nursing, psychology, social work, public health, and a variety of medical specialties. This collaboration should begin in the planning stages to ensure that well-controlled research projects that incorporate the role of occupational therapy from a client-centered and occupation-based perspective are designed.

The future of occupational therapy is based on all its practitioners developing an understanding of the best available evidence. This agenda is also clear for academic programs that are educating, training, and preparing the next generation of occupational therapy practitioners. Educators need to be aware of the results of the systematic reviews and present this multifaceted information to students in consideration of current curricula and interventions with limited supporting evidence. In addition, the evidence should not be presented in a one-size-fits-all framework but should be discussed from a client-centered and occupation-based perspective as described in the Framework (AOTA, 2008).

AOTA’s Centennial Vision (AOTA, 2011) looks to a future in which occupational therapy meets society’s needs by being a powerful, science-driven, and evidence-based profession. Although the results of these systematic reviews have wide-ranging implications for occupational therapy, the Centennial Vision also indicates that the most important target audiences with which practitioners should share the results of these reviews are community-dwelling older adults interested in maintaining an active and productive lifestyle and participating in their homes and communities. ▲

References