Factors Related to Evidence-Based Practice Among U.S. Occupational Therapy Clinicians

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OBJECTIVE. The purpose of this study was to examine how U.S. occupational therapists access and use clinically relevant research results.

METHOD. During the spring of 2000, 209 clinically practicing occupational therapists who were members of the American Occupational Therapy Association responded to a survey (58% response rate). The distribution of opinions and self-reported behavior was portrayed by descriptive statistics, and chi-square cross-tabulations and Pearson correlation coefficients were calculated between demographic and evidence-based practice variables.

RESULTS. Respondents occasionally accessed research information through a variety of resource media. The majority (57%) implemented between one and five new, research-based treatment plans in the past year. Compared with respondents with less experience, a greater proportion of respondents with 15 or more years of clinical experience did not believe that research conclusions usually translated into treatment plans for individual clients ($X^2 = 20.620, p < .01$). Almost three fifths (59%) of respondents reported that time was provided on the job to attend continuing education; however, 45% strongly disagreed that time was available at work to access research information. Other reported barriers to research utilization included lack of time on the job, high continuing education costs, weak research analysis skills, and placing higher value on clinical experience than on research.

CONCLUSIONS. These findings suggest that therapists are currently engaging in a modest amount of evidence-based practice. Removing the barriers identified in this study may increase research utilization among clinicians.


The translation of research into clinical practice is the primary goal of scientific health professions (Ottenbacher, Barris, & Van Deusen, 1986) and is the ideal behind evidence-based practice. Evidence-based practice is an ethical, conscientious, discriminative process of applying the best research-based evidence to decisions regarding client care (Lloyd-Smith, 1997). To use evidence-based practice, therapists must be able to obtain current research pertinent to their practice and apply it in their clinical setting. The media used to access current research, however, such as scholarly journals, the Internet, and continuing education lectures, may be confusing, time consuming, or inaccessible because of factors such as urban or rural location (Kohler & Mayberry, 1993) and practice setting (Ottenbacher et al., 1986). Practicing clinicians may not consider topics researched and published by academics relevant or may consider well-researched treatments too elaborate or impractical to implement in some clinical settings (Ottenbacher et al., 1986). Although numerous articles explaining and encouraging evidence-based practice have been published in North American medical and nursing journals, at the time of this study, occupational therapy journals in the United States boasted very few (Holm, 2000; Tickle-Degnen, 2000a, 2000b, 2000c). Of these articles, none was
found to document the frequency of research use among U.S. occupational therapists or perceptions regarding barriers to the evidence-based practice process. Authors of published papers appear to have assumed that U.S. occupational therapists are not engaging in an adequate amount of evidence-based practice (Alsop, 1997; Brown & Rodger, 1999; Lloyd-Smith, 1997) and that barriers identified by nursing studies are similar to those experienced by occupational therapists (Egan, Dubouloz, von Zweck, & Vallerand, 1998; Law & Baum, 1998; Lloyd-Smith, 1997; Ottenbacher et al., 1986).

Key goals of occupational therapy research are to validate occupational therapy as a profession and to aid in the clinician’s decision-making process (Llorens, 1990). These goals include (a) theory development, (b) evaluation and validation of tests and measurements, (c) identification of treatment intervention effects, (d) increasing the professional knowledge base for clinical reasoning, and (e) contributing to society’s understanding of occupation (Brown & Rodger, 1999; Deitz, 1998). For these goals to be achieved fully, therapists need to be able to access, understand, and use research findings.

In the modern health care climate of limited resources, new technology, self-advocating clients, and an emphasis on outcomes, therapists must be effective and efficient (Brown & Rodger, 1999). One method to optimize clinical effectiveness and efficiency, as advocated by Alsop (1997), is to base therapeutic interventions on quality research through the professional process known as evidence-based practice. This process has recently gained the attention of a variety of health care professions.

Evidence-based practice is the systematic process of finding, analyzing, and using the best available, scientifically sound research to guide therapists in decision making so that clients may be treated with the most powerful, effective, and safe interventions (Egan et al., 1998; Lloyd-Smith, 1997; Rosenberg & Donald, 1995; Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). Rosenberg and Donald (1995) outlined steps for implementing evidence-based practice: (a) formulate a clinical question; (b) search for relevant literature; (c) analyze results for validity, reliability, and usefulness; (d) implement results; and (e) evaluate their effect.

The nursing literature has reported the positive effects of evidence-based practice for clients and employees for more than a decade. Heater, Becker, and Olson (1988) conducted a meta-analysis of 84 randomized controlled studies and concluded that research-based nursing interventions yielded gains in behavioral, psychological, and physiological client outcomes compared with standard nursing care. Mosley, Galindo-Ciocon, Peak, and West (1998) attributed the dramatic success of a hospital-based fall prevention program to the use of evidence-based practice, declaring it as “the best way to establish standards of care” (p. 43). Titchen and Binnie (1993) noted that nurses who accessed research experienced greater motivation and interest in their work as well as a sense of ownership of their profession. This finding, however, may not generalize to other nurses or health professionals because only nurses working on a single hospital ward were studied.

Despite these favorable reports, evidence-based practice still may not be used widely. A survey of 1,500 nurses by Bostrum and Suter (1993) revealed that only 23.4% had ever used a new research finding in their practice, and only 15.9% reported making such a practice change in the past 6 months. Although this somewhat outdated study may not reflect current trends among nurses accurately, it is noteworthy that low research utilization has been (and still is) an issue within the nursing profession. In contrast, the prevalence of evidence-based practice among occupational therapists remains largely unknown. For example, Egan et al. (1998) cited Ottenbacher et al. (1986) as claiming that research evidence necessary for therapeutic clinical decision making was lacking—a conclusion Ottenbacher et al. reached based on nursing research, not occupational therapy-related studies. Similarly, Brown and Rodger (1999) wrote that a research–practice gap existed within occupational therapy and cited Lloyd-Smith (1997), who had defined and encouraged evidence-based practice among occupational therapists without citing empirical evidence that such a gap actually existed. The Evidence-Based Practice Forum in The American Journal of Occupational Therapy (AJOT) has contained theoretical and prescriptive articles not based on empirical data of practice itself. One qualitative study of eight Canadian occupational therapists has been published (Dubouloz, Egan, Vallerand, & von Zweck, 1999). The study revealed important insights but did not attempt a comprehensive, national scope or claim generalizability to therapists in the United States.

Factors influencing evidence-based practice implementation exist on system and individual levels (Law & Baum, 1998). At the system level, factors include administrative support (Alsop, 1997), physical accessibility (Funk, Champagne, Wiese, & Tornquist, 1991; Kohler & Mayberry, 1993), and the perceived applicability of research findings (Egan et al., 1998; Haynes, 1993). Factors at the individual level include knowledge and skill (Funk, Champagne, Tornquist, & Wiese, 1995), motivation (Van Deusen & Fox, 1981), attitude (Hatcher & Tranmer, 1997), and learning style (Ottenbacher et al., 1986). Available time is a major factor that influences the use of evidence-based practice at both system and individual levels.
Information about how U.S. occupational therapists access and use research as well as about what factors are related to evidence-based practice were not found in the published literature. The purpose of this study, therefore, was to examine how occupational therapists in the United States access clinically relevant research literature, how they incorporate research findings into their practice, and what factors are related to this professional process.

Method
Design
The primary purpose of this study was to estimate the prevalence of evidence-based practice use among U.S. occupational therapists. Also of interest were therapist perceptions of resource accessibility, quality of research, and use of evidence-based practice. Prevalence, perceptions, and opinions can be obtained through self-report, and because the population of interest is large and geographically scattered, a survey questionnaire was chosen as the most efficient means of collecting data for descriptive and association analysis.

Instrument
A two-page questionnaire was developed by the first author and contained three sections: demographics, current use of evidence-based practice, and factors related to its use. For the purpose of the survey, research was defined as scientifically based information focusing on human health and wellness. The demographics section included region of practice (urban or rural); practice setting; years of clinical experience; educational degree; and research experience, including involvement in research studies and hours of research classes in the past 2 years. To examine current use of evidence-based practice, we asked how often respondents used various research media to which they had access. The survey also asked how frequently respondents used current research information to develop or alter therapeutic treatment plans in the past year.

The section on factors related to evidence-based practice required respondents to rate on a 5-point Likert scale (from strongly disagree to strongly agree) items that they perceived to either hinder or encourage their use of evidence-based practice. The factors consisted of 21 items under the categories of accessibility of various information media, time availability on the job, skills necessary to obtain and comprehend information, applicability of research to clinical practice, value of current research, and administrative support.

The majority of the statements were worded in a research-positive manner (e.g., “I can easily obtain research articles”). Seven questions, however, were stated in a research-negative manner (e.g., “Enrollment costs prevent me from attending important continuing education courses”) and, therefore, were reverse Likert–coded in the database. Numeric coding for all statements, then, retained the same values, where 3 indicated a neutral opinion, 1 (strongly disagree) and 2 (disagree) described inhibiting factors, and 4 (agree) and 5 (strongly agree) indicated facilitating factors. The survey also provided an opportunity for respondents to write comments.

Participants and Procedure
Following university Human Subjects Review, a pilot questionnaire was administered to 6 occupational therapists, and revisions were made on the basis of their input. The final formatted questionnaire was mailed to 400 occupational therapists selected from the most recent American Occupational Therapy Association (AOTA) membership list through a systematic random process. In January 2000, each selected therapist was sent a packet through first-class mail that contained a cover letter explaining the study’s purpose, the questionnaire, and a coded business response envelope. Occupational therapists who were currently practicing or who had practiced within the previous 3 months in a clinical setting met the inclusion criteria. The coded envelope was used to eliminate respondents from the reminder mailing list. Upon its return, the envelope was immediately separated from the unmarked survey to maintain confidentiality. After 3 weeks, another first-class mailing was completed for nonrespondents. To determine whether the response patterns of late respondents differed from those of the initial respondents, second mailing responses were coded separately in the database. Returned questionnaires were not accepted after March 2000.

Data Analysis
Demographic and use of evidence-based practice variables were characterized by descriptive statistics, including frequency, central tendency, and variability, to portray the distribution of opinions and behavior (Portney & Watkins, 2000). For example, to give a convenient indicator of the strength of responses reflecting greater use of evidence-based practice, means and standard deviations were calculated for each of the 21 factors related to use of evidence-based practice (see Table 1). Chi-square cross-tabulations were calculated between demographic and evidence-based practice variables. Data were coded as “missing” if no answer was given, if a mark was between two options rather than in one or the other, or if answers were double-marked.
Table 1. Factors Related to Evidence-Based Practice

<table>
<thead>
<tr>
<th>Factor Statement</th>
<th>M ± SD</th>
<th>SD (%)</th>
<th>D (%)</th>
<th>N (%)</th>
<th>A (%)</th>
<th>SA (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resource availability</strong></td>
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<tr>
<td>Community, university or professional libraries are conveniently accessible to me.</td>
<td>3.34</td>
<td>± 1.18</td>
<td>17 (8)</td>
<td>41 (20)</td>
<td>34 (16)</td>
<td>87 (42)</td>
</tr>
<tr>
<td>I can easily obtain research articles.</td>
<td>3.50</td>
<td>± 0.98</td>
<td>6 (3)</td>
<td>24 (12)</td>
<td>50 (24)</td>
<td>103 (50)</td>
</tr>
<tr>
<td>Continuing education courses are offered at reasonably convenient times and locations.</td>
<td>3.23</td>
<td>± 1.04</td>
<td>12 (6)</td>
<td>39 (19)</td>
<td>45 (22)</td>
<td>105 (51)</td>
</tr>
<tr>
<td>Enrollment databases are conveniently available to me.</td>
<td>2.67</td>
<td>± 1.23</td>
<td>38 (18)</td>
<td>69 (33)</td>
<td>36 (17)</td>
<td>51 (25)</td>
</tr>
<tr>
<td><strong>Time</strong></td>
<td></td>
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<td></td>
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<tr>
<td>Time is provided on the job to access research information.</td>
<td>1.90</td>
<td>± 1.05</td>
<td>94 (45)</td>
<td>65 (31)</td>
<td>27 (13)</td>
<td>18 (9)</td>
</tr>
<tr>
<td>Time is provided on the job to attend continuing education courses.</td>
<td>3.29</td>
<td>± 1.21</td>
<td>28 (13)</td>
<td>26 (12)</td>
<td>32 (15)</td>
<td>103 (49)</td>
</tr>
<tr>
<td><strong>Skill</strong></td>
<td></td>
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<tr>
<td>I can confidently use electronic databases to search for research information.</td>
<td>2.45</td>
<td>± 1.14</td>
<td>45 (22)</td>
<td>77 (37)</td>
<td>46 (22)</td>
<td>29 (14)</td>
</tr>
<tr>
<td>I can confidently use the Internet as a tool to search for research information.</td>
<td>3.15</td>
<td>± 1.16</td>
<td>16 (8)</td>
<td>50 (24)</td>
<td>49 (24)</td>
<td>70 (34)</td>
</tr>
<tr>
<td>I feel confident critically appraising the quality of research studies.</td>
<td>2.96</td>
<td>± 0.98</td>
<td>9 (4)</td>
<td>71 (34)</td>
<td>54 (26)</td>
<td>69 (33)</td>
</tr>
<tr>
<td><strong>Research applicability and usefulness</strong></td>
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<tr>
<td>Research results are usually written clearly and understandably.</td>
<td>2.79</td>
<td>± 0.96</td>
<td>14 (7)</td>
<td>64 (31)</td>
<td>77 (37)</td>
<td>49 (24)</td>
</tr>
<tr>
<td>Many research results are interesting and relevant to my clinical practice.</td>
<td>2.97</td>
<td>± 0.91</td>
<td>11 (5)</td>
<td>47 (23)</td>
<td>88 (42)</td>
<td>58 (28)</td>
</tr>
<tr>
<td>Research conclusions usually translate into useful treatment plans for individual clients.</td>
<td>2.78</td>
<td>± 0.85</td>
<td>10 (5)</td>
<td>67 (32)</td>
<td>88 (42)</td>
<td>42 (20)</td>
</tr>
<tr>
<td>It is not difficult to base practice decisions on research literature due to a prevalence of conflicting conclusions.</td>
<td>2.83</td>
<td>± 0.84</td>
<td>5 (2)</td>
<td>64 (31)</td>
<td>97 (47)</td>
<td>38 (18)</td>
</tr>
<tr>
<td>Research is not overly scientific nor does it undermine my professional artistry.</td>
<td>3.55</td>
<td>± 0.94</td>
<td>6 (3)</td>
<td>14 (7)</td>
<td>62 (30)</td>
<td>103 (50)</td>
</tr>
<tr>
<td><strong>Values</strong></td>
<td></td>
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<tr>
<td>Learning procedures and gaining clinical experience is less valuable to me than understanding research and theory.</td>
<td>2.76</td>
<td>± 1.04</td>
<td>20 (10)</td>
<td>76 (36)</td>
<td>55 (26)</td>
<td>50 (24)</td>
</tr>
<tr>
<td>More therapists should use research in their practice.</td>
<td>3.55</td>
<td>± 0.71</td>
<td>1 (0)</td>
<td>9 (4)</td>
<td>87 (42)</td>
<td>98 (47)</td>
</tr>
<tr>
<td><strong>Administrative support</strong></td>
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<tr>
<td>Administration and managers at my work site support the implementation of new treatment plans based on research information.</td>
<td>3.30</td>
<td>± 0.88</td>
<td>6 (3)</td>
<td>30 (14)</td>
<td>80 (38)</td>
<td>82 (39)</td>
</tr>
<tr>
<td>I feel I have enough authority to change established therapeutic procedures.</td>
<td>3.51</td>
<td>± 0.96</td>
<td>6 (3)</td>
<td>29 (14)</td>
<td>49 (23)</td>
<td>103 (49)</td>
</tr>
<tr>
<td>The facility in which I currently work is adequate for new treatment plan implementation.</td>
<td>3.72</td>
<td>± 0.88</td>
<td>3 (1)</td>
<td>20 (10)</td>
<td>40 (19)</td>
<td>115 (55)</td>
</tr>
</tbody>
</table>

Note. SD = strongly disagree; D = disagree; N = neutral; A = agree; SA = strongly agree. For each item, n varied from 207 to 209.

Results

A total of 246 questionnaires were returned (of which 1 was marked “return to sender” and 36 were not completed because the respondents indicated that they had not practiced clinically in the past 3 months). Subtracting these 37 nonrelevant recipients from 400 gave a final sample of 363. The 209 appropriate, responding therapists thus represented a response rate of 58% (209/363). Return envelopes were postmarked from 43 states. Respondents represented a range of clinical work experience (< 5 years, 30%; 5–15 years, 32%; ≥ 15, 38%), region of practice (73% urban, 27% rural), academic degrees (68% baccalaureate, 29% master, 3% doctoral), and practice settings (21% schools, 18% rehabilitation facilities, 14% hospitals, 11% early intervention settings, 11% skilled nursing facilities, 8% home health, 6% mental health, 11% other). The sample’s distribution of academic degrees and primary practice settings closely reflected the population described in the 1996 AOTA Member Data Survey. Demographic categories with few respondents were subsumed into similar categories or were not used in the cross-tabulation analysis.

Cross-tabulations were completed for all survey items comparing respondents who replied to the first mailing to those who replied to the second to determine similarity of response patterns. Only two demographic variables—work experience and home health setting—differed significantly. Thus, the data of respondents to the first and second mailings were considered essentially equivalent and combined. The similarity of response patterns of the late responders to those of the early responders may indicate greater generalizability of results to sample nonrespondents—to extend a line of reasoning used by Brogan (1980).

Access to Resources and Frequency of Use

A large majority of respondents reported having access to all listed sources of information (see Table 2). They used journal articles and texts most frequently; 63% read articles at least once a month. Similarly, many (43%) attended in-services, discussion groups, and work meetings at least once a month. A large majority attended conference presentations and continuing education workshops a few times a year. The majority did not use computer resources, however,
except Internet Web sites, which 71% reported using at least a few times a year (68% of those who had access) (see Table 2).

Frequency of resource use was associated with highest academic degree obtained, region of practice, and research experience. Among respondents who used full-text electronic databases at least once a year, a significantly greater percentage had a master’s degree, $X^2 (3, 150) = 9.810, p < .05$. Interestingly, 100% of respondents in rural practice attended continuing education workshops a few times a year, whereas urban respondents’ attendance ranged from never to once a month or more, $X^2 (3, 202) = 9.470, p < .05$. Greater research experience, including course attendance and involvement in research projects, also was associated (through $X^2$ cross-tabulations) with more use of electronic databases, a research specialist, articles and texts, and Internet Web sites ($p < .05$).

Frequency of Research Implementation

Overall, the majority (57%) of respondents reported that they had used current research information to alter or develop one to five research-based treatment plans in the past year. Greater research experience was associated with a greater frequency of research implementation ($r = .235, df = 191, p < .02$). The frequency of research implementation was not associated with any other demographic variables.

Factors Related to Evidence-Based Practice

Resource availability. A majority of respondents believed that they did have convenient access to a professional library (with 56% marking agree or strongly agree); research articles (62%); continuing education classes (54%); and Internet databases (79%), although some noted that Internet access was from home only. On the other hand, a bare majority noted a lack of conveniently available electronic databases (50%) and identified high enrollment costs as a strong barrier to attending continuing education courses (51%) (see Table 1). Additionally, a significantly greater proportion of rural respondents noted a lack of convenient libraries compared with urban respondents, $X^2(4, 204) = 19.864, p < .01$.

Administrative support. Less than half (44%) of the respondents agreed or strongly agreed that they had managerial support for research-based treatment plans; however, a large majority (70%) believed that their facilities were adequate for the implementation of new treatment plans. Similarly, a solid majority (60%) claimed to possess the authority to change established therapeutic procedures, particularly those who had 15 or more years of work experience, $X^2(8, 208) = 19.114, p < .05$. No other variables were associated with perceptions of administrative support.

Time. More than half (59%) of the respondents believed that time was provided on the job to attend continuing education courses. Ironically, a lack of time on the job to access research information was the most predominantly identified barrier—more (45%) strongly disagreed with this statement than with any other. A greater percentage of respondents associated with a skilled nursing facility or long-term-care unit noted this lack of time compared with those in other settings, $X^2(4, 207) = 11.088, p < .05$. No other variables were associated with perceptions of time.

Research applicability. A majority (61%) of respondents reported that they did not perceive that research undermined their professional artistry by being overly scientific. About one third perceived research results as unclear and difficult to understand (38%), believed that research conclusions did not usually translate into useful treatment plans for individual clients (37%), and noted difficulty with basing practice decisions on research literature because of a prevalence of conflicting conclusions (33%). Opinions about whether research was relevant to their clinical practice, however, were nearly evenly divided (30% agree, 28%
disagree, others neutral). Compared with respondents with less experience, a greater proportion with 15 or more years of clinical experience did not believe that research conclusions usually translated into treatment plans for individual clients, $X^2(8, 201) = 20.620, p < .01$.

**Skills.** Many respondents (45%) felt confident using the Internet as a research tool. About the same proportion (33%) felt confident critically appraising the quality of research studies compared with those who did not (38%). A majority (59%), however, reported difficulty using electronic databases.

Two resource utilization variables significantly cross-tabulated with respondents’ skill levels. A greater proportion with bachelor's degrees felt less confident using electronic databases than those respondents with master's degrees, $X^2(4, 199) = 10.544, p < .05$. Years of work experience was inversely related to confidence using the Internet: Respondents with more than 5 years of experience felt less confident using the Internet as a research tool than those with less experience, $X^2(8, 207) = 18.340, p < .05$.

**Value.** A majority (54%) of respondents believed that more therapists should use research in their practice; however, many (42%) were neutral. A greater percentage of respondents with master's degrees strongly believed that more therapists should use research than did those with bachelor's degrees, $X^2(4, 199) = 14.962, p < .01$. Many respondents (46%) still valued clinical experience over research and theory.

**Discussion**

**Access to and Availability of Resources**

Research on nursing professionals has suggested that an increase of access to research reports would increase research utilization (Funk et al., 1991). Straightforward “access” to research results, ranging from articles to computer-based resources, however, did not appear to be a major difficulty for occupational therapists in the current study. The convenience of this access, not access itself, was an issue for respondents in rural-based practice.

Many respondents employed in a rural setting (44%) reported a lack of convenient professional libraries, although not quite to the limiting degree reported of health professionals in Great Britain (Merry, 1997). Contrary to Kohler and Mayberry (1993), who found that 50% of rural occupational therapists were dissatisfied with the availability of continuing education workshops, rural respondents did not express greater discontent than urban respondents, and overall, fewer (25%) were dissatisfied than in 1993. Despite this dissatisfied minority, all rural respondents indicated attending continuing education courses a few times a year, as did the majority of urban respondents. The issue of inconvenient access to continuing education, then, was only a minor barrier for rural respondents. The high cost of continuing education workshops, however, was noted by more than half of all respondents as a barrier to attending important courses.

**Frequency of Resource Use**

Respondents reported using journal articles and texts most frequently (63% reported use at least once a month) and generally used other resources at least a few times a year, although computer resources aside from Internet Web sites (i.e., Web discussion groups, electronic databases) typically were never used by a majority of respondents. The reported frequency of article use, however, may not generalize to non–AOTA members because surveyed clinicians at least received bimonthly issues of AJOT and biweekly issues of OT Practice (which some may have regarded as a journal) and, thus, had more convenient access to articles. Chi-square cross-tabulation revealed a significant association between frequent use of journal articles and a greater valuing of research and theory. It is unclear, however, whether valuing research and theory motivated respondents to read articles, whether reading articles promoted a greater valuing of research results, or whether other variables were involved.

Respondents attended continuing education courses and conference presentations with similar frequency—a few times a year. As previously stated, despite dissatisfaction regarding availability, all rural respondents attended workshops. A small percentage of urban respondents did not participate in continuing education. Perhaps instead of continuing education workshops, these few urban respondents used other resource avenues to which rural respondents did not have access, such as university libraries. For the majority of respondents, more convenient access to continuing education courses, as experienced by urban respondents, did not correspond with more frequent attendance. Therefore, it could be argued that if convenient access to continuing education were increased for rural therapists, these therapists would not necessarily attend workshops with any greater frequency.

Computer resources were used less frequently than the aforementioned media—a finding consistent with data from other health profession fields (Haynes, 1993). A majority (71%) of respondents, however, used Internet Web sites as a research tool at least a few times a year. The suspected greater rate of computer use among hospital-based therapists compared with those in other practice settings was not substantiated by the data from the current study.
Perceived Barriers to the Evidence-Based Practice Process

As did individuals in the nursing profession (Funk et al., 1991), occupational therapists identified a lack of time on the job as a strong barrier to accessing research information. Unlike the nurses in the study by Funk et al. (1991), other systemic variables, such as a lack of administrative support and inadequate facilities, were not reported. Additionally, contrary to the early suggestion of Ottenbacher et al. (1986), the current study did not find that therapists associated with a hospital setting perceived less administrative support. The reported institutional support may be more philosophical than practical, however, because respondents strongly asserted that within their departments productivity was a greater priority than accessing research. Written statements included: “I would love to use research in my practice if time were allowed. I am constantly under pressure to meet a 75% productivity rate (and it is even higher in some places)” and “Work hours are spent in direct service, after hours in work-related paper work and task planning, plus time for family—no time left to seek out research information (though I highly value the research information I do happen to receive at workshops and conferences).”

A majority (59%) of respondents agreed that time was provided on the job to attend continuing education courses but also noted (51%) that high cost was a moderate barrier to enrollment. How much time and financial support were provided was not explored. Written statements included: “Employers are not paying for continuing education or even paying you to take the day off (even if you are paying out of pocket for the workshop)”; “Due to productivity standards at my facility I feel that continuing education is not supported”; and “My professional conference time off is very limited.”

Contrary to Alsop’s (1997) assertion, respondents of all degree levels and work experience categories generally agreed that research did not undermine professional artistry by being overly scientific (61%). They did believe, however, that research was unclear (38%), difficult to use because of conflicting findings (33%), and did not translate well into useful treatment plans for individual clients (37%); many respondents were neutral about research applicability (37%–47%). In one respondent’s words, “[Research] data gave me more questions than results and the effort produced little new productive information. Practical application [of literature] to daily skills intervention would be refreshing.” These opinions supported previous assumptions that occupational therapists perceive that research is overly theoretical (Ottenbacher et al., 1986), is too confusing because of a prevalence of conflicting results (Ottenbacher & Maas, 1999), and often recommends interventions too elaborate to be useful in a clinical setting (Ottenbacher et al., 1986).

Of the respondents who believed that research did not translate well into individual treatment plans, the majority (57%) had 15 or more years of clinical experience (compared with only 38% with this amount of experience in the entire sample). Research itself or the educational approach to research may have changed in the past 10 years so that less experienced clinicians are more willing and better equipped to use research or that as clinicians acquire expertise, they come to rely more on the effects they see from their own treatments.

In the health professions literature, low computer skills and poor critical appraising skills have been cited as major barriers to the evidence-based practice process (DeLisa, Jain, Kirshblum, Christodoulou, 1999; Funk et al., 1995). Contrary to older literature, many respondents (45%) in the current study claimed feeling confident in using the Internet. Similar to nursing professionals (Bostrum & Suter, 1993), some (38%) noted difficulty critically appraising the quality of research studies, whereas many (59%) reported poor skills using electronic databases. A higher level of education, however, was associated with greater confidence using electronic databases. It may be that master’s level curricula provide more instruction and practice with such databases, or perhaps, the motivation to obtain a master’s degree similarly impelled students to gain the skills to use electronic databases. Critical analysis skill levels were not associated with level of education or any other demographic variable. Having fewer than 5 years work experience, however, was associated with greater Internet confidence, probably also because of these respondents having had more recent professional education.

Hatcher and Tranmer (1997) described attitude as the most important predictor of research use among 392 surveyed nurses. They found that nurses with a positive attitude toward research (as well as access and perceived support) were more likely to engage in research use. The motivation to use research also is derived from perceptions of the value of research, and education may play a role in shaping such opinions (Champion & Leach, 1989; Hatcher & Tranmer, 1997). In the current study, a majority (54%) of respondents believed that more therapists should use research in their practice; however, many (42%) were neutral on this point. Consistent with the literature, respondents with master’s degrees believed more strongly than those with bachelor’s degrees that more therapists should use research. In the past, occupational therapists have been characterized as tending to be kinetic and con-
crete learners who often characterize research as being overly abstract and theoretical (Ottenbacher et al., 1986). Indeed, 46% of respondents in this study indicated that they valued clinical experience over research and theory (although this particular item may have been confusing). Such an undervaluing of research and theory may be a major barrier to increasing research use.

**Implementing Research-Based Treatment Plans**

A disparity may exist between reported use of research resources and the translation of this research information into clinical treatment plans. Respondents reported occasional and even frequent use of various research media, but the majority (57%) had only altered or developed 1 to 5 treatment plans based on research results in the past year. The internal factors of skill level and one’s value of research did not correspond with frequency of implementation, nor did administrative support. Rather, the perception that research is clinically relevant and not overly scientific was associated with having more than 11 research-based treatment plans altered or developed in the past year. The perception of low research applicability to clinical practice, then, may be a moderate barrier to using evidence as a basis for practice, as asserted by Ottenbacher et al. (1986) and Ottenbacher and Maas (1999). Compared with increasing access to resources (which probably was more of an issue 5 years ago than today), improving the clinical relevance of research studies while making scientific terminology more accessible may be the challenge for the near future.

**Implications for Occupational Therapy Practice**

Interest within the occupational therapy profession about research use is mounting. Holm (2000) addressed in her Eleanor Clarke Slagle lecture the promotion of evidence-based practice in every issue (Tickle-Degnen, 2000a, 2000b, 2000c). The barriers most significantly impeding greater research utilization in clinical practice identified in the current study were a lack of time on the job, high costs of continuing education workshops, perceptions of low research applicability, moderate devaluing of research, and infrequent use of electronic databases secondary to a lack of convenient access and skills. Overall, it appears that U.S. occupational therapists are engaging in a modest amount of evidence-based practice. If the occupational therapy community determines that increasing evidence-based practice among clinicians is a desirable goal, then mitigating these specific barriers may be one effective means of achieving it.

Although it is difficult to boost directly on-the-job time available, it may be possible to decrease the amount of time required to obtain research. One respondent wrote: “If AOTA had published synopses of research findings with suggestions for application in the field, I would have taken time to read these.” *AJOT* has published companion “Clinical Interpretation” articles in recent years to enhance article applicability. In addition, publications such as the Cochrane Collaboration, a relatively new computer-based phenomenon that emphasizes systematic reviews of research literature (Hayes & McGrath, 1998; Holm, 2000), may prove to be excellent resources for therapists. Access to the Cochrane Collaboration, however, requires some computer skills. The finding in the current study that many respondents read articles frequently suggests that systematic reviews of research would be useful in promoting evidence-based practice (e.g., Baker & Tickle-Degnen, 2001; Kraskowsky & Finlayson, 2001).

The change in entry-level academic degree requirement from baccalaureate to postbaccalaureate in the field of occupational therapy also may encourage evidence-based practice among therapists. In the current study, higher academic degree was linked to greater electronic database skills and slightly greater appreciation of research results. To encourage research utilization further, the findings suggest the need for educational programs to provide numerous opportunities for next-generation therapists to practice resource acquisition (especially computer based); to acquire critical analysis skills; and to absorb a sense of value for research, especially as it applies to clinical practice.

**Limitations**

Because the survey in the current study was a newly developed instrument, its reliability and validity were unknown. The wording of a few items may have been confusing to some respondents. Because the sample’s demographics (academic degree and work settings) closely reflected the distributions among all AOTA members, it is likely that the sample is a good representation of the population from which it was drawn. These results, however, may not generalize to U.S. occupational therapists as a whole. For example, AOTA members may have better access to journal articles because they receive *AJOT* as a benefit of membership, which, in turn, may influence their perceptions and use of research. Finally, the fast rate of change in computer access and Internet use means that some of these findings could become quickly out of date.

**Directions for Future Research**

The goal of this study was to describe the status of evidence-based practice among occupational therapists in the United States. Among the sampled population of AOTA members, the majority accessed research through a variety of resources
(especially journal articles) at least a few times a year and occasionally synthesized these results into individual treatment plans. The most prominent barrier to the evidence-based practice process was lack of time on the job to access research information, a constraint that may be exacerbated by high productivity demands. Ironically, although work sites typically did not provide time on the job to access computer-based resources, they did provide time off to attend continuing education courses yet frequently offered only limited funds for enrollment. The cost of continuing education was cited often by respondents as a barrier to course attendance. Investigation of how to overcome these costs may be warranted.

The perceived weak applicability of research to clinical practice also was cited by respondents as a frequent barrier and was especially important because it was associated with the report of decreased research implementation. Continued efforts to increase the clarity of applied research reports and to describe how results can be translated into practical clinical procedures seem important in the promotion of evidence-based practice among occupational therapists. Discovering the exact mechanism for this difficulty in application among some therapists also could be of value to the profession.

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