Information-seeking practices of dental hygienists

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This paper reports on a survey of the information-seeking, critical-analysis, and computer-application practices of dental hygienists. Questionnaires were mailed to a convenience sample of seventy-one dental hygiene practitioners. A 62% response rate was achieved. Results indicated that discussions with colleagues, continuing education courses, journals, and newsletters were the sources used most frequently for professional development and information retrieval. To evaluate professional information, these hygienists tended to rely on personal experience, credibility of the journal, and discussions with colleagues. Word processing was the most frequently used computer application; online database searching was rare in this group. Computer use within the employment setting was primarily for business rather than clinical applications. Many hygienists were interested in attending continuing education courses on use of computers to acquire professional information.

INTRODUCTION

Health practitioners need information management skills to cope with the growing volume of medical knowledge [1–7]. The ability to quickly access, track, coordinate, critique, and store information is essential to informed daily decision making related to patient care, education, and research [8]. In addition, changes in the health care systems of industrialized countries have placed new demands on health care services. Delivery of care has “become interwoven with adoption of and adaptation to computer and information technologies” [9].

Dental hygienists function in a constantly changing information environment and need to keep up to date in the practice of their profession. Not only does information facilitate their ability to make valid decisions and statements about dental hygiene, but information also enables hygienists to provide quality care to their patients. There has been little research on dental hygienists’ information-seeking practices.
The few studies that have been conducted indicate that dental hygienists primarily use continuing education courses to obtain information [10-13]. There were no studies found on computer applications used by dental hygienists in patient care, education, and research. It would be useful to identify information-seeking practices, computer applications used, and the degree of user comfort in this profession. Therefore, a survey was undertaken to provide preliminary findings on the validity of the questionnaire for a larger study [14-15]. This paper reports those initial findings.

METHODOLOGY

A thirty-six-item questionnaire was developed to assess the information-seeking, critical-analysis, and computer-application practices of dental hygienists. Numerous studies in the dental, nursing, and medical fields were examined before designing the questionnaire [16-41]. Then an exploratory survey was carried out to evaluate the validity of the measuring instrument in preparation for a larger study [42-43].

In July 1992, a cover letter; questionnaire; and stamped, self-addressed reply envelope were sent to a sample of seventy-one dental hygiene practitioners. These hygienists were selected because of longevity in the profession as well as variation in employment practices. No follow-up questionnaires were sent to nonrespondents. Subjects were informed that all responses would be confidential and reported only in group form.

Statistical analysis included the calculation of frequencies, percentages, and means. A t test was used at the .05 level of significance to analyze variation in type of employment setting as it affected information-seeking and computer-application practices. Results, however, cannot be generalized beyond the selected population due to the small sample size used in this study.

RESULTS AND DISCUSSION

Forty-four (62%) of seventy-one questionnaires were returned and used for data tabulation. Not all respondents answered each question; percentages are based on total responses to each question. The hygienists employed in private clinical practice (PCP) were compared to those working in alternative employment settings (AES) represented by education, public health, hospitals, and other employment settings besides those listed. Given the small sample, it is difficult to draw valid conclusions regarding these comparisons; however, there were some differences between these groups.

Demographic profile

Representation in the sample by state was California, 24 (54.5%); Hawaii, 7 (15.9%); Colorado and Maryland, 2 each, for a total of 4 (9.1%); and Arizona, Georgia, Iowa, Maine, Montana, Nevada, New York, Ohio, and Virginia, 1 each, for a total of 9 (20.5%). All hygienists were female, ranging in age from 30 to 67 years, with a mean age of 42.9 years. Year of graduation from dental hygiene school ranged from 1959 to 1984. Thirty-four of the respondents held certificates or associate degrees in dental hygiene (77.3%), twenty-one held baccalaureate degrees (47.7%), eleven had a master's degree (25%), and four had doctorates (9.1%). One respondent had become a dentist (2.3%). These respondents averaged twenty years of employment in the dental field.

Twelve hygienists conducted professional research, and ten had published in professional journals. Thirty-five hygienists belonged to professional associations (79.5%), an average of 2.4 groups each. Hygienists in PCP (n=19) joined an average of 1.5 professional associations, while those in AES (n=15) averaged 3.6 association memberships.

Thirty-six (81.8%) hygienists were employed at the time the questionnaire was completed, with the remaining eight not employed. All forty-four hygienists had worked in clinical practice, averaging 16.7 years of employment in that setting. Twenty-six hygienists had worked in PCP only (59.1%). Eighteen hygienists had worked in AES (40.9%), and ten respondents had worked in more than one type of AES (22.7%). Eleven hygienists were educators (25%), and two were directors of professional degree programs. Eight hygienists had worked in public health, five were administrators of public health programs, and two had been employed in hospital settings.

A source of confusion in interpreting employment practices is the number of different work settings within which dental hygienists can be employed. In this population sample, thirty-six hygienists worked in 49 settings, resulting in an average of 1.4 work settings per hygienist. Thirty-nine of these employment settings had computers (79.6%). Of those lacking computers, 2 private-practice settings had plans to acquire equipment within the next twelve months. Thus, results indicated that 41 of 49 employment settings would have computers within the year (83.7%).

Professional information

Ninety-three percent of respondents felt it was important to stay current with dental hygiene information. When asked if the volume of professional information was unmanageable, 37.2% agreed, and an equal percentage disagreed. Many hygienists found it difficult to keep up with their reading of relevant
information (59.5%). Sixty-two percent found it was difficult to find time to search and retrieve information related to their professional interests. Also, the majority of respondents (66.7%) felt it would be useful to be able to search through a variety of professional articles when information was needed at work.

A total of 164 journals was received by the forty-four hygienists, so the average number of professional journals received each month was 3.7, with a range from 0 to 15. The PCP hygienists (n=26) received 71 journals each month, for an average of 2.7 journals per person. The AES hygienists (n=18) received 93 journals each month, for an average of 5.2 journals per person. Respondents indicated that, of 164 journals, 66 (40.2%) were read thoroughly, 82 (50%) were read occasionally, and 15 (9.2%) contents were just browsed. One person (0.6%) received a journal but did not read it.

Respondents received 114 professional newsletters or magazines each month, for an average of 2.6 newsletters per hygienist, with a range from 0 to 10. The PCP hygienists (n=26) received 51 publications, for an average of 2 per person, while those in AES (n=18) received 63, for an average of 3.5 publications per person. Forty-nine of these publications were read thoroughly (43%), forty-three occasionally (37.7%), twenty-one browsed (18.4%), and one was discarded (0.9%).

Two questions provided a multi-item list of resources with a frequency-of-use scale to determine sources used for professional development and sources used to obtain professional information. For professional development sources, hygienists most frequently used discussions with colleagues (79.1%), continuing education courses (69.8%), and journals (67.4%), while library resources (14%), computer searches (9.4%), and audiocassettes (9.5%) were used infrequently (Table 1).

Results indicated the main sources used for obtaining professional information pertinent to the practice of dental hygiene were asking colleagues (62.8%) and browsing journals, books, and newsletters (54.8%), while conducting (9.5%) or having someone else conduct (14.6%) a computer search and using the public library (2.4%) were used infrequently (Table 2). Some sources were used significantly more often by the AES than the PCP hygienists: medical or dental library, conducting a computer search, and having a computer search done by someone else.

Thus, the sources used most frequently by this sample of hygienists for professional development and job-related information retrieval were continuing education courses, discussions with colleagues, and journals. These information-seeking practices are similar to those found in other studies of the medical and dental professions [44–51].

When asked to identify barriers encountered when seeking professional information, eight hygienists designated "time." Other cited barriers included problems with "availability or accessibility" of resources. One hygienist lived in an isolated state with no dental school and felt that public-health budget restrictions limited resources. Uncertainty concerning where specific information could be found was expressed by other respondents. "It is difficult to quickly find articles pertaining to a particular subject," stated one respondent. Five respondents indicated there were no barriers, with one stating, "I work in a four-office specialist complex that has many resources available."

The hygienists also were asked about their proximity to a collection of dental information sources.

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Table 1

<table>
<thead>
<tr>
<th>Source*</th>
<th>n</th>
<th>Always</th>
<th>Often</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Discussions with colleagues</td>
<td>43</td>
<td>11</td>
<td>25.6</td>
<td>23</td>
<td>53.5</td>
</tr>
<tr>
<td>Continuing education courses</td>
<td>43</td>
<td>20</td>
<td>46.5</td>
<td>10</td>
<td>23.3</td>
</tr>
<tr>
<td>Journals</td>
<td>43</td>
<td>16</td>
<td>37.2</td>
<td>13</td>
<td>30.2</td>
</tr>
<tr>
<td>Newsletters</td>
<td>42</td>
<td>13</td>
<td>31.0</td>
<td>13</td>
<td>31.0</td>
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<tr>
<td>Association meetings</td>
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<td>13</td>
<td>30.2</td>
<td>11</td>
<td>25.6</td>
</tr>
<tr>
<td>Conventions</td>
<td>43</td>
<td>5</td>
<td>11.6</td>
<td>15</td>
<td>34.9</td>
</tr>
<tr>
<td>Books</td>
<td>43</td>
<td>5</td>
<td>11.6</td>
<td>6</td>
<td>14.0</td>
</tr>
<tr>
<td>Manufacturers' mailing/sales reps</td>
<td>43</td>
<td>2</td>
<td>4.7</td>
<td>8</td>
<td>18.6</td>
</tr>
<tr>
<td>Videos/tapes/slides</td>
<td>43</td>
<td>1</td>
<td>2.3</td>
<td>5</td>
<td>11.6</td>
</tr>
<tr>
<td>Library resources</td>
<td>43</td>
<td>3</td>
<td>7.0</td>
<td>3</td>
<td>7.0</td>
</tr>
<tr>
<td>Computer search</td>
<td>43</td>
<td>2</td>
<td>4.7</td>
<td>2</td>
<td>4.7</td>
</tr>
<tr>
<td>Audiocassettes</td>
<td>42</td>
<td>0</td>
<td>—</td>
<td>4</td>
<td>9.5</td>
</tr>
</tbody>
</table>

* Sources ranked in order of highest combined response to "always" and "often."
Table 2
Sources used by dental hygienists to obtain professional information

<table>
<thead>
<tr>
<th>Source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Always</td>
</tr>
<tr>
<td>Ask a colleague</td>
<td>43</td>
</tr>
<tr>
<td>Browse journals, books, newsletters</td>
<td>42</td>
</tr>
<tr>
<td>Medical/dental library</td>
<td>42</td>
</tr>
<tr>
<td>Consult manufacturer/sales rep</td>
<td>42</td>
</tr>
<tr>
<td>Conduct computer search</td>
<td>42</td>
</tr>
<tr>
<td>Have computer search done</td>
<td>42</td>
</tr>
<tr>
<td>Public library</td>
<td>42</td>
</tr>
<tr>
<td>Continuing education course†‡</td>
<td>42</td>
</tr>
<tr>
<td>Ask the dentist†</td>
<td>42</td>
</tr>
<tr>
<td>Call agencies†‡</td>
<td>42</td>
</tr>
<tr>
<td>Requested reference studies via mail†‡</td>
<td>42</td>
</tr>
</tbody>
</table>

* Sources ranked in order of highest combined responses to "always" and "often.
† These other sources were added by hygienists.

and impact of proximity on access to these sources. It appears that distance is a factor. Twenty-five of the responding hygienists lived within twenty miles of a dental information collection. Twelve hygienists did not find a ten-mile distance to be a limiting factor. On the other hand, among those that were more than ten but less than twenty miles away, four respondents felt this distance was not a factor in their ability to access dental information.

Evaluation of information

Responses to a multi-item question with a frequency-of-use scale indicated that hygienists rely on personal experience (95.4%), the credibility of a journal (90.7%), and discussions with colleagues (74.4%) to evaluate professional information. Less-popular evaluation tools were methodology used (65.2%), author’s reputation (41.9%), consultation with professional associations (23.3%), and professional teaching institutions (16.7%). There was a significant difference in this area between PCP and AES hygienists, with the latter consulting teaching institutions more frequently to critically analyze professional information.

Dental informatics

The majority of respondents (75%) did not know what the term dental informatics meant. Twenty-nine of the hygienists owned a computer (65.9%), and eight others had access to a computer. Within this group, fourteen of thirty-seven hygienists had modems (37.8%). One respondent did not know if there was a modem connected to the computer. Among hygienists without access to a computer, two had plans to purchase a computer within the next twelve months.

Eleven hygienists had conducted computer database searches when looking for professional information (25%), while another respondent’s secretary did this task. Nine hygienists (all AES) indicated specific databases used to retrieve information. When asked to choose from a list or fill in blank spaces, results showed that seven hygienists had used MEDLINE (15.9%), two had used DENTALPROJ (4.5%), two had used AIDSLINE (4.5%), one hygienist added GRATEFUL MED, and another stated that “a database was developed in-house for staff only.”

Another multi-item question assessed nine computer applications, the degree of comfort using each application, and level of respondent training. A Likert rating scale was used to establish the degree of comfort (Table 3). Twenty hygienists were very or moderately comfortable using the word-processing application (45.5%). Sixteen of the twenty-eight hygienists who indicated use of this application had training (57.1%). Use rates for the other eight applications ranged from fifteen using computer-aided instruction (34.1%) to no users for “voice activated clinical exams.” The AES hygienists used word processing and database management with a statistically significant higher degree of comfort than did PCP respondents.

Thirty-nine employment settings had computers. Respondents who worked in these settings were asked to designate specific computer applications used and type of setting. Five different employment settings (PCP, hospital, public health, teaching institution, and “other”) were listed. Due to the limited representation for all settings except PCP, the other employment settings were consolidated. Findings indicated that the most commonly used computer applications were accounts and billing functions (76.9%) and word pro-
cessing (76.9%). The “bibliographic search and retrieval of information” application was used in ten (25.6%) of thirty-nine employment settings, with more frequent use in AES than in PCP (Table 4).

These findings indicate that many hygienists owned or had access to a computer yet rarely retrieved information pertinent to the practice of their profession through database searching. Word processing was the most frequently used application. Computer applications used within the employment settings were primarily for business rather than clinical functions; these results are similar to other health profession studies [52-53].

The questionnaire concluded with three questions concerning interest in and opinions about computers. Twenty-four of the respondents thought computer skills would assist them in accessing information needed in dental hygiene practice (54.5%). Twenty-eight hygienists were interested in continuing education courses on how to use the computer to acquire professional information (63.6%). Also, the majority of these hygienists felt that computer skills should be introduced to students while they were obtaining a dental hygiene degree (70.5%).

CONCLUSIONS

It is important to know how dental hygienists acquire professional information. Knowledge of information-seeking practices helps in delineating effective means of disseminating dental hygiene information. Such knowledge also serves as a foundation for providing dental hygienists with guidelines for information management and defining the skills they will need to cope with an increasingly computerized health care environment.

The results of this survey suggest there may be differences in information-seeking practices and computer applications based on the type of employment setting. Due to the small sample used in this study, the findings need to be validated with a larger sample of hygienists.

It is difficult to compare information-seeking practices and computer applications used in the dental and medical fields due to variations in clinical practice resources. Most dental personnel work in private offices, while many medical personnel work in hospitals and clinics. Larger facilities often have more space and money to provide an assortment of information resources and computerized equipment that would not be feasible within a solo practice. Therefore, comparisons of the medical and dental fields need to acknowledge the differences in technical resource bases.

Overall, the sample of hygienists in this study had limited computer skills. Many respondents felt that computer skills would be helpful in accessing information needed in professional practice and were interested in attending continuing education courses to learn about online database searching. The majority of hygienists also indicated that computer skills should be introduced to students while they are obtaining their dental hygiene degree.

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Table 3
Dental hygienists’ degree of comfort using computer applications (n = 44)

<table>
<thead>
<tr>
<th>Application*</th>
<th>Very comfortable</th>
<th>Moderately comfortable</th>
<th>Minimally comfortable</th>
<th>Not comfortable</th>
<th>Do not use</th>
<th>Trained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word-processing program</td>
<td>12 27.3</td>
<td>8 18.2</td>
<td>7 15.9</td>
<td>1 2.3</td>
<td>16 36.4</td>
<td>16 28</td>
</tr>
<tr>
<td>Computer-aided instruction</td>
<td>3 6.8</td>
<td>5 11.4</td>
<td>5 11.4</td>
<td>2 4.5</td>
<td>29 65.9</td>
<td>5 9</td>
</tr>
<tr>
<td>Database management</td>
<td>3 6.8</td>
<td>5 11.4</td>
<td>6 13.6</td>
<td>0 —</td>
<td>30 66.7</td>
<td>8 18</td>
</tr>
<tr>
<td>Spreadsheet</td>
<td>3 6.8</td>
<td>4 9.1</td>
<td>6 13.6</td>
<td>2 4.5</td>
<td>29 65.9</td>
<td>8 18</td>
</tr>
<tr>
<td>Statistical package</td>
<td>0 —</td>
<td>5 11.4</td>
<td>5 11.4</td>
<td>2 4.5</td>
<td>32 72.7</td>
<td>3 4</td>
</tr>
<tr>
<td>Telecommunications software</td>
<td>1 2.3</td>
<td>2 4.5</td>
<td>3 6.8</td>
<td>0 —</td>
<td>38 86.4</td>
<td>4 40</td>
</tr>
<tr>
<td>Intraoral video</td>
<td>2 4.5</td>
<td>1 2.3</td>
<td>2 4.5</td>
<td>0 —</td>
<td>39 88.6</td>
<td>3 41</td>
</tr>
<tr>
<td>Periodontal probing</td>
<td>0 —</td>
<td>0 —</td>
<td>1 2.3</td>
<td>0 —</td>
<td>43 97.7</td>
<td>0 44</td>
</tr>
<tr>
<td>Voice-activated clinical exams</td>
<td>0 —</td>
<td>0 —</td>
<td>0 —</td>
<td>0 —</td>
<td>44 100.0</td>
<td>0 44</td>
</tr>
</tbody>
</table>

* Applications ranked in highest combined responses to “very” and “moderate” degree of comfort.

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Table 4
Computer applications used in dental settings

<table>
<thead>
<tr>
<th>Application*</th>
<th>Private clinical</th>
<th>Other†</th>
<th>Total settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient accounts and billing functions</td>
<td>26</td>
<td>4</td>
<td>30</td>
</tr>
<tr>
<td>Word processing</td>
<td>18</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>Third-party claims</td>
<td>18</td>
<td>1</td>
<td>17</td>
</tr>
<tr>
<td>Database management</td>
<td>8</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Scheduling appointments</td>
<td>9</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Bibliographic search and information retrieval</td>
<td>3</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Intraoral video system</td>
<td>8</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>Intraoral imaging system</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Periocular probing</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Computer-aided design/computer-aided manufacturing</td>
<td>1</td>
<td>2.6</td>
<td>1</td>
</tr>
<tr>
<td>Voice-activated clinical exams</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Digital radiography</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* Applications ranked in order of highest combined dental setting responses.
† Teaching/hospital/public health/other.

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