Abstract

Future scenarios on the relational and therapeutical treatment of patients of various ages are inevitably restricted by the available material and logistic possibilities. The aim of the study was to establish the logistic capacity of the private dental offices of Iași and the receptivity of their owners to the software products available on the market, as well as the extent of use of modern means of data investigation and storage, for a subsequent monitorization of odontal pathologies. Materials and method. Out of the 130 applied questionnaires, 88 were not filled in by the respondents (participation ratio = 67.69%). Results and discussion: A large number of dentists considered in the present study do have and use computers in their offices, first as they considerably simplify communication (e-mail, internet) and, to a much more reduced extent, for administrative (files recording, book keeping, accounts, schedule records) or clinical aspects. Access to Internet has been frequent, in most cases at higher rate. Conclusions: The main reasons which explain the absence of Internet access in dental offices should be related to the lack of interest from the part of their owners. Keywords: dental practice, personal computer, information systems

INTRODUCTION

Computers are now being present in almost all domains of the modern world. Until 2000, computers were present in almost half of the houses of Canada and the USA (1), their utilization in business fields being even more important: a questionnaire devoted to Canadian institutions revealed that, since 1999, about 82% of them used computers (2). In the last two decades, the frequency of computer utilization in private dental offices has constantly increased. In the USA, the first complete detailed questionnaire, elaborated by the American Dental Association (ADA) was published in 1984, when about 11% of the American stomatologists used computers. Since then, constant increases have been registered: 27% (1987), 37% (1990), 67% (1994), 80% (1997) and 85% (2000) (1). In Australia, the first report on such topic was issued also in 1984, when about 9% of the interviewed dentists used a computer. Seven years later, the percent value was of 37%. In 1989, only 6% of the Scottish stomatologists used computers in dental practice. In 2003, the dental offices from a small province of England gave an utilization rate of computers of 77%. Back in 1984, in dental offices, computers were considered useful exclusively for book keeping, administration and/or for the education of patients (2). Starting with 1992, a constantly increasing utilization of computers in dental practice, with applications in digital radiology, statistics, video imaging, obtaining of images with intraoral cameras and CAD/CAM devices, was anticipated. Last but not least, the questionnaire elaborated in the year 2000 by ADA indicated that administration still represents the main application of computers.

THE AIM OF THE STUDY

The aim of the present study was to establish the logistic capacity of the private dental offices of Iași, for evidencing the receptivity to various software products and the extent of their utilization, as well the application of modern means of data investigation and storage, assuring monitorization of odontal pathologies.
MATERIALS AND METHOD

130 questionnaires were sent to an equal number of dental offices, by e-mail or regular mail, for establishing the existing information base and the extent of its practical utilization, the Internet access, the application of programs and of various correlations regarding the addressability of the information systems.

Data were analyzed by descriptive statistical methods, with Excel (Microsoft) and Statistics (StatSoft) programs. The percent values for each variable were based on the number of respondents to the corresponding question. Previous studies (1-4) reported descriptive statistics, such as frequency and gamma, no attempts at establishing statistical correlations being made.

RESULTS AND DISCUSSION

Out of the 130 applied questionnaires, 88 were not filled in by the respondents (participation ratio = 67.69%). All the 88 respondents provided complete data, all answers being available for analysis.

Demographic distribution of respondents

The average age of the experimental group was of 38.89 years (DS = ± 9.92), and that of the experience in stomatological practice was of 14.2 (DS = ± 8.01).

Table 1. Descriptive statistics according to age distribution and experience of the group

<table>
<thead>
<tr>
<th></th>
<th>Valid N</th>
<th>Mean</th>
<th>Median</th>
<th>Min</th>
<th>Max</th>
<th>Variance</th>
<th>StdDev</th>
<th>Skewness</th>
<th>Std.Err</th>
<th>Kurtosis</th>
<th>Std.Err</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>88</td>
<td>40.22</td>
<td>37.00</td>
<td>29.00</td>
<td>58.00</td>
<td>22.06</td>
<td>4.68</td>
<td>0.57</td>
<td>0.25</td>
<td>-0.79</td>
<td>0.50</td>
</tr>
<tr>
<td>Experience</td>
<td>88</td>
<td>14.39</td>
<td>12.00</td>
<td>3.00</td>
<td>31.00</td>
<td>65.69</td>
<td>8.10</td>
<td>0.43</td>
<td>0.25</td>
<td>-0.99</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Table 4 shows a slight right asymmetry of age distribution (Skewness = 0.57), as well as of stomatological experience distribution (Skewness = 0.43) and a platykurtic distribution of the two variables (Kurtosis = -0.79, respectively -0.99).

The respondents were 31 men (35.2%) and 57 women (64.7%).

Computer use

In the tables to follow, „0” = no while „1” = yes.

Out of the 88 respondents, 84 (95.45%) do have computers, only 4 of them (4.54%) not having such equipments. Most frequently (44 cases, i.e. 50%), the computers are equipped with CD-ROM.

Digital cameras are present in 52 consulting rooms (59.09%).

The observation was made that 4 of the respondents (4.54%) do not have a computer, either at home or in the office.
Software utilization

As to the programs usually employed in dental offices, the most frequent was the e-mail – 56 (63.63%), followed by Internet browser – 48 (54.54%) and programs for patients’ registering – 40 (45.45%).

Internet connection

With the exception of 12 doctors who do not have an Internet connexion, all the others have it either at home or both at home and in the office. The type of connexion is either dial-up or broad-band.

A frequent observation is that Internet is accessed for obtaining information on various products – 72 respondents (81.81%), followed by accessing for continuous education – 68 (72.27%), and, on the last position, for on-line acquisition of stomatological products.

The necessity of using the computer and computerized applications in stomatological practice

The main reasons recommending the utilization of the computer and of the information applications in dental offices involved: larger access to information (83.36%), simpler data processing (72.72%), increased professionalism of the medical team (68.18%).

Communication/access

As to the possible communication with patients via Internet, 68 respondents (77.27%) considered it as an advantage, 12 (13.63%) payed no attention to it, the remaining ones answering “I do not know”.

An interesting, slightly controversial aspect of the questionnaire refers to question 16, regarding registering of patients’ observation sheets in an on-line data base to which other physicians should have access, as well.

Only 24 doctors (27.27%) would accept such a possibility, 60 (68.18%) being clearly against it, other 4 answering “I do not know”.

As to the access of the patients to their observation sheets, 40 respondents (45.45%) gave a positive answer, 24 (27.27%) a negative one, other 24 persons (27.27%) answering “I do not know”.

Statistical correlations

The tables given below use the following symbols:
• Grp. 1 = physicians who do not consider necessary registering of the observation sheets in an on-line data base accessible to their colleagues, as well (code 0)
• Grp. 2 = physicians who consider necessary registering of the observation sheets in an on-line data base accessible to their colleagues, as well (code 1)
• Grp. 3 = physicians who answered: „I do not know”.

Table 2. Nonparametric test – multiple independent samples (groups) for age

<table>
<thead>
<tr>
<th>Depend.</th>
<th>Age</th>
<th>Code</th>
<th>Valid N</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grp. 1</td>
<td>0</td>
<td>60</td>
<td>2903500</td>
<td></td>
</tr>
<tr>
<td>Grp. 2</td>
<td>1</td>
<td>24</td>
<td>767500</td>
<td></td>
</tr>
<tr>
<td>Grp. 3</td>
<td>2</td>
<td>4</td>
<td>218000</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Nonparametric test – multiple independent samples (groups) for experience

<table>
<thead>
<tr>
<th>Depend.</th>
<th>Experience</th>
<th>Code</th>
<th>Valid N</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grp. 1</td>
<td>0</td>
<td>60</td>
<td>2903500</td>
<td></td>
</tr>
<tr>
<td>Grp. 2</td>
<td>1</td>
<td>24</td>
<td>767500</td>
<td></td>
</tr>
<tr>
<td>Grp. 3</td>
<td>2</td>
<td>4</td>
<td>218000</td>
<td></td>
</tr>
</tbody>
</table>

Tables 2 and 3 evidence a strong correlation (p = 0.0171, respectively, p = 0.0211) between the types of responses and age, and, respectively, experience.

Table 4 shows that the number of younger doctors who do not agree with the on-line access to the observation sheets is of 26 (lower with 4 units than the expected number), the remaining 34 having ages over the calculated average value of 41.96.

Figure 7 shows that the mean age of the doctors who do not agree with on-line registering of the observation sheets and with the access of other doctors to them is of 41.96, while that of the ones who agree is of 35.58. Figure 8 shows that the mean years of experience for those who do not accept registering in an on-line data base is of 15.91, while that of those who accept this idea is of 10.37 years.

Most of the respondents had a CD-ROM reader and a modem. Approximately half of them had a colour printer, the possibility of taking digital photos, graphic and sound cards, and DVD/CD-writers. The respondents said that they use their computers especially for storing documents, for communication and information and less for book keeping and processing of their revenues. In some offices, computers have been also used for visits’ scheduling and in the management of stomatological practice.

High-speed Internet and broad-band modified the manner in which most of us live today, on also modifying stomatological practice. The stomatological community seems to have accepted high-speed services as an acceptable Internet opportunity, 37% of those connected to Internet having also a broad-band connexion, 8% of them indicating that upgrading to broad-band services will be realized in the following 12 months. On-line acquisition of stomatological products is not yet usual in România.

Information on computer and Internet utilization by physicians permits to the suppliers of stomatological services and products to appreciate to what extent their market is prepared to use computerized services (such as, digital radiography and photography, programming and memorization systems, intraoral cameras). The medical staff and the physicians could use these...
data for determining the possible communication with their colleagues and patients by means of Internet (e-mail correspondence, consultations etc.) (5).

On-line data bases (such as PubMed, Cochrane, MEDLINE) represent key instruments in research activities, their utilization depending on the access to Internet. Also, more and more journals provide online access and evaluations. All these represent sound arguments pleading in favour of Internet extended utilization.

Clinic stomatology registered increased information and IT innovations, which permits application of computerized graphs, digital radiology, Florida probe, Oral CDX, simulation programs and CAD/CAM systems (6-8).

CONCLUSIONS

A large number of dentists considered in the present study do have and use computers in their offices, first as they considerably simplify communication (e-mail, Internet) and, to a much more reduced extent, for administrative (files recording, book keeping, accounts, schedule records) or clinical aspects. Among them, only a few use the computer at its full potential, for example for plotting of computerized graphs or for the analysis of clinical results.

Access to Internet has been frequent, in most cases at higher rate. The main reasons which explain the absence of Internet access in dental practice should be related to the lack of interest from the part of their owners.

Computerized technologies represent clinical realities of modern stomatology. In spite of their still limited large-scale access, first because of the high costs they involve, they remain the future instruments of the high-performance medical practice. Denying or ignoring of such systems demonstrates one’s incapacity to understand and adapt to the progresses recorded in technical fields, as well as in medicine, being a proof of one’s fear of facing the challenges of the modern times.

References