Information technology in community pharmacies for supporting responsible self-medication

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Self-medication is an important health-related concept.1-5 Thomas and Noyce4 showed that self-treatment of common ailments with nonprescription medicines is almost universal. It is currently accepted that self-care and responsible self-medication can be beneficial for patients and health systems.5 However, it is also recognized that self-medication must be accompanied by appropriate health information.1,2,4-6 These ideas are elaborated in a 1994 document from the European Commission,7 which stressed that community pharmacies have a key responsibility in providing information to the public about nonprescription products and the circumstances under which a physician should be consulted. This function of pharmacists is substantiated by their central role in the distribution of medicines, along with their availability to patients (there are more than 128,000 community pharmacies in the European Union with extended hours of service). To help community pharmacists provide drug information, specially tailored information and appropriate training are required.5,8 New information technologies offer a wide range of possibilities.9-12 These technologies seem especially appropriate for drug information because community pharmacies are geographically dispersed and because the type of information to be supplied needs frequent updating and benefits from interactivity.

TESEMED (TElematics in Community Pharmacies for Responsible SELF-MEDication) and TESEMED-II are research projects funded by the European Commission. Their objective is to develop, test, and implement informatics applications in European community pharmacies in...
order to disseminate information and training on responsible self-medication. TESEM ED applications are multilingual; the languages currently used are English, Italian, Spanish, and Catalan.

**TESEM ED application for community pharmacists.** To act as patients’ advisers on self-medication, pharmacists need to distinguish cases in which they are qualified to suggest possible remedial actions from those in which the patient should be referred to a physician. In cases in which only a minor ailment (one that can be considered nonserious, self-limiting, of short duration, and responsive to symptomatic treatment) is present, the pharmacist is qualified to suggest possible remedial actions. This process benefits from the existence of appropriate protocols that support the effective identification of alarm signals.

One of the TESEM ED applications is a set of computer programs for informing and training community pharmacists. These applications are based on ad hoc protocols for handling minor ailments (protocols for colds, influenza, hemorrhoids, constipation, and cough are currently available) that have been prepared by a panel of pharmacists and physicians from several European countries. Each program (one per ailment) consists of three modules. The first module is a hypertext version of the protocol that includes a description of the ailment and its symptoms, the circumstances that require referral to a physician, the appropriate treatment with nonprescription medicines or hygienic measures, and a selection of appropriate protocols that the pharmacist is qualified to select the ones that are appropriate for the automatically generated patient profile.

The TESEM ED application for pharmacists runs on personal computers with a Pentium processor and MS-Windows and is distributed, downloaded, and updated through the TESEM ED Web site (www.imim.es/tesemed).

**Evaluating the application.** A central activity of the TESEM ED projects is systematic evaluation of applications. In the case of the application for community pharmacists, this activity has involved pharmacists who have not participated in the application’s development. The main topics assessed during testing have been the pharmacists’ general opinion of this type of program, their opinion of the structure and appearance of the TESEM ED application, and their views on its usefulness. A questionnaire was developed to investigate these issues. This questionnaire was administered after demonstrations of the program in London (n = 14 pharmacists), Almería (n = 31), Barcelona (n = 23), and Verona (n = 16). The first three demonstration sessions involved the first version of the application. The session in Verona involved an improved release of the application developed by taking into account opinions collected during the previous demonstration. The mean ± S.D. age of the 84 pharmacists interviewed was 41.2 ± 11.6 years. Thirty-four respondents were men and 48 were women (the sex of 2 was not recorded).

One question asked about the use of the Internet for drug information and ongoing training of community pharmacists. The mean ± S.D. score of responses (on a scale from 0

### Table 1. Evaluation of TESEM ED Application for Community Pharmacists

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean ± S.D. Score (No. Respondents)</th>
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</thead>
<tbody>
<tr>
<td><strong>Initial Version</strong></td>
<td></td>
</tr>
<tr>
<td>Overall opinion of the TESEM ED application</td>
<td>3.60 ± 0.68 (67)</td>
</tr>
<tr>
<td>General structure of program: ailment descriptions, protocol scheme, and encounter simulator</td>
<td>3.79 ± 0.69 (66)</td>
</tr>
<tr>
<td>Style and appearance of ailment descriptions</td>
<td>3.31 ± 0.76 (62)</td>
</tr>
<tr>
<td>Layout of protocol scheme</td>
<td>3.42 ± 0.72 (66)</td>
</tr>
<tr>
<td>Structure of encounter simulator</td>
<td>3.33 ± 0.71 (66)</td>
</tr>
<tr>
<td>Appearance of encounter simulator</td>
<td>3.31 ± 0.87 (64)</td>
</tr>
<tr>
<td><strong>Improved Version</strong></td>
<td></td>
</tr>
<tr>
<td>Overall opinion of the TESEM ED application</td>
<td>4.50 ± 0.63 (16)</td>
</tr>
<tr>
<td>General structure of program: ailment descriptions, protocol scheme, and encounter simulator</td>
<td>4.50 ± 0.73 (16)</td>
</tr>
<tr>
<td>Style and appearance of ailment descriptions</td>
<td>4.44 ± 0.63 (16)</td>
</tr>
<tr>
<td>Layout of protocol scheme</td>
<td>4.19 ± 0.66 (16)</td>
</tr>
<tr>
<td>Structure of encounter simulator</td>
<td>4.06 ± 0.85 (16)</td>
</tr>
<tr>
<td>Appearance of encounter simulator</td>
<td>4.44 ± 0.63 (16)</td>
</tr>
</tbody>
</table>

*Scored on a scale from 1 to 5, where 1 = worst opinion and 5 = best opinion.

*Each score for the improved version is significantly different from the corresponding score for the initial version (p ≤ 0.003, Mann-Whitney U test).
More needs to be learned about the use of such kiosks by patients and about patients’ and pharmacists’ opinions of their usefulness. A controversial question is the effect that information kiosks could have on the pharmacist–patient dialogue. One possibility is that such systems will replace needed pharmacist–patient dialogue; another is that kiosks will encourage such dialogue. According to the Finnish Association of Pharmacists, experience gained with the ELIAS system supports the second hypothesis.

TESEMED projects are systematically assessing these issues as kiosks circulate through European pharmacies. The sampled pharmacies are stratified with respect to the mean cultural level of customers and urban versus rural location. The kiosks automatically record the number of uses and the characteristics of each use (screens visited and time spent). In addition, pharmacists hosting the kiosks and customers who have just used them are being surveyed by professional interviewers. Similar questionnaires are being used in Finland to investigate the same topics for the more than 150 ELIAS kiosks in use there.

**Conclusion.** TESEMED and TESEMED-II, research projects funded by the European Commission, are successfully developing, testing, and implementing information applications in European community pharmacies designed to disseminate information and training on responsible self-medication.

**References**