

Public Radio as a Means of Continuing Education in Pharmacy

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Public radio has been used as an educational medium in Finland for over 50 years, but not within pharmacy until 1990, when a radio series called "Safe Use of Medicines" was arranged. In the first part of the study we evaluated the listener response and listener activity by sending two questionnaires to a random sample of 22 pharmacies in Eastern Finland. In the second part of our study we measured the cognitive changes associated with three of the six programs that were recorded on audio cassettes and given as in-house training material to four large pharmacies with 64 participating assistant pharmacists (2.5-year university diploma). Despite positive attitudes towards continuing education via radio the readiness to participate was modest among pharmacy personnel in Finland. However, radio programs in the form of audio cassettes significantly enhanced the levels of participants' cognitive knowledge. According to the opinions of the participants both radio programs and audio cassettes are suitable means of continuing education for keeping up pharmacists' professional skills. The participants found it desirable to arrange this kind of education in the future as well.

INTRODUCTION

Continuing education (CE) is a big challenge worldwide^(1,2) New developments within medicine and pharmacy require a constant updating of knowledge and skills. For CE to be successful, a wide range of options is necessary. Innovative approaches using CD-rom technology and Internet connections offer new and exciting possibilities. However, in practice the majority of pharmacists in most countries do not necessarily use or have the possibility of using these innovations for various reasons. Financial limitations and attitudinal resistance will still limit the use of these new means. Therefore it is important to look for alternative and additional methods that suit different audiences in diverse settings, both in developed and developing countries.

Public radio has been used as an educational medium in Finland for more than 50 years⁽³⁾, mostly for school children, but during the last few decades, for adult education and open university education as well. The long time use of this medium has proven it to be an easily accessible way to study, cost-effective and also able to reach a wide audience. However, radio as an educational medium in pharmacy, was not used until 1990, when the Finnish Centre for Continuing Pharmaceutical Education together with the YLE (The Finnish Broadcasting Company) regional radio of eastern Finland and the University of Kuopio arranged a radio series titled "Safe Use of Medicines."

As radio was being used for the first time in Finnish continuing pharmaceutical education, we wanted to determine how actively the pharmacists and assistant pharmacists in the transmission area participated in this type of education. Their opinions regarding this kind of education were also of interest to us. Furthermore, we also wanted to find out how much this education would affect pharmacists' and assistant pharmacists' cognitive knowledge about the topics in question.

MATERIALS AND METHODS

The radio series "Safe Use of Medicines" consisted of six programs (30 min each), broadcast twice a week. The topics of the programs were: 1) Analgesics; 2) Vitamins and trace elements in nutrition; 3) First aid of poisonings; 4) New dosage forms for medicines; 5) Design of new medical substances; and 6) The proper attitude about medicines. Printed material was also produced by the experts of each program. A written exam, based on these programs, was arranged for volunteer participants by the University of Kuopio.

The University of Kuopio sent altogether 9,000 information leaflets about the radio series to schools and educational institutions; libraries, health care organizations, health centers, hospitals and the pharmacies in the audibility area. The content of the radio programs was also published in the

Finnish pharmacy professional journals. The broadcasting company did not conduct any inquiries among the public to what extent people in general had followed the programs.

Part 1. Survey of the Listening Activity and Opinions of Participants

We sent two different questionnaires to 22 randomly selected pharmacies from a total of 81 pharmacies in the area. It was not possible to determine the exact number of pharmacies covered by the transmissions as the broadcasting company could not give any precise audibility data. Therefore, a conservative estimate of the coverage was used. The pharmacies were stratified into four groups: (i) small rural pharmacies (n = 26) with their annual number of prescriptions less than 30,000; (ii) larger rural pharmacies (n = 23) with their annual number of prescriptions 30,000 or more; (iii) small pharmacies (n = 18) in the cities with their annual number of prescriptions less than 60,000; and (iv) large pharmacies (n = 14) in the cities with their annual number of prescriptions 60,000 or more. Twenty-five per cent of each subgroup was taken by lot to the study, *i.e.*, seven pharmacies from group 1, six from group 2, five from group 3 and four from group 4.

The first questionnaire was directed to the pharmacy as a unit, with questions about the listening activity of the professionals and background information on the pharmacy. The second questionnaire was designed for the individual pharmacists (a five-year university degree) and assistant pharmacists (2.5-year university degree; assistant pharmacists are regarded as a part of the pharmaceutical staff in Finland). It consisted of questions regarding the listeners' background and opinions of the programs. The same questionnaire was also given to the voluntary participants in the written exam at the University of Kuopio.

Only 11 of the 22 pharmacies selected in this study returned the questionnaires. A total of 83 individual questionnaires were returned and further processed. These included the questionnaires from 24 assistant pharmacists, 11 pharmacists, 23 pharmacy students, seven pharmacy technicians and 15 nurses or other health care professionals. In addition, there were also three respondents who did not give their professional status.

Part 2. Measurement of the Impact on Knowledge

In connection with the radio programs it was not feasible to study the impact of the programs on listeners' knowledge levels under standardized conditions. Therefore we selected three programs (Analgesics, First aid of poisonings and New dosage forms for medicines) representing different aspects of pharmacy practice for further evaluation. These programs were tape-recorded on audio cassettes to be used as in-house continuing education.

The evaluation of the cassettes was done in four branches of the University Pharmacy of Helsinki. The participants (n = 64, all assistant pharmacists) listened to the cassettes in small groups (2-5 persons) once during a normal work day, and in order to make the conditions equal to all listeners, no rewinding was allowed. The assistant pharmacists listened to them as if they were the original radio programs. As we wanted to study the impact of the radio programs on knowledge, the participants did not use the printed material either, which was produced together with the radio programs.

For each topic, the knowledge levels were measured before education, immediately after and again two weeks

Table I. Respondent's opinions about the different modules of the radio series

Topic	Percent			
	Interesting	Timely	Useful	Difficult
Part I (n=47-70)				
Analgesics	58	88	39	3
Vitamins and trace elements	56	93	38	1
First aid of poisoning	60	72	33	2
New dosage forms for medicines	46	79	37	41
Design of new medical substances	29	61	24	55
The proper attitude about medicines	66	82	43	0
Part II (n=63-64)				
Analgesics	58	81	22	16
First aid of poisonings	78	84	17	27
New dosage forms	59	91	21	43

after listening to the cassettes. Three different sets of questions were used. The questionnaires were pretested by a group of assistant pharmacists working in community pharmacies. Based on achieved mean scores there were no differences in the difficulty between the different sets of questions. Besides knowledge levels, the participants in this second part of our study were asked questions regarding their opinions of audio cassettes as a means of education. The results were analyzed with the SPSS/PC- statistical program(4).

RESULTS

Listening Activity and Opinions

From those 11 pharmacies which returned the questionnaires 57 percent (34/60) of the pharmaceutical staff had listened to some of the programs, only five of them (eight percent) more than three programs. An unsuitable transmission time (6 PM.) was the most common complaint, especially among those who worked in pharmacies (50 percent of them found the transmission time to be unsuitable).

Participants' opinions about the different modules of the education showed some interesting differences in terms of how interesting, timely, useful or difficult they found them to be (Table I). The most interesting topic was "The proper attitude about medicines" (66 percent of the respondents from part one of the study found it quite or very interesting). All programs were assessed to be of current interest. The best evaluations were given to the program "Vitamins and trace elements in nutrition" (93 percent regarded it as quite or very timely), the lowest evaluations to "Design of new medical substances" (61 percent: quite or very timely). "New dosage forms for medicines" and "Design of new medical substances" were regarded to be more difficult than the other topics. When participants were asked if the programs had been useful for them in maintaining their professional skills, most of the programs received good

evaluations. The topic "Design of new medical substances" was found to be somewhat less useful than the other topics.

Assistant pharmacists taking part in the second part of our study found the topic "New dosage forms for medicines" very difficult, as was the case in the first part of the study. Assistant pharmacists found the other two topics more difficult than did the respondents in the first part of our study (no statistical evaluations performed). The participants in the first part of the study also used printed material besides listening to the programs, while the participants in the second part did not.

Fifty-nine percent of all the respondents from part one of the study considered that there had been enough preadvertising of the programs. Seventy-eight percent of the respondents (62/80) — despite the fact that many of them had not listened to the programs — found the arranging of this radio series as necessary, while only two respondents from one pharmacy considered it unnecessary (15 respondents chose the alternative "difficult to say", three did not answer at all). A great majority of the respondents (96 percent) shared the opinion that this kind of an education is worth arranging also in the future.

When the respondents in the second part of our study were asked, whether they would listen to the educational cassettes on their way to work, if this opportunity was arranged, only 40 percent told, that they probably would do so. In the first part of the study, the broadcasting time (6:00 PM) of the programs was found to cause difficulties. When assistant pharmacists in the second part of the study were asked if they would like to listen to educational programs from the radio at specific, regular times, only 19 percent of them agreed. Thirty-one per cent of them said, that they would perhaps listen to regular broadcasts, while an equal percentage would not listen to the programs at constant times. They found it difficult because most of them also work late in the evenings.

One disadvantage was found in our study concerning the listening to the audio cassettes: disturbance from the equipment or the environment in the pharmacies. More than half of the respondents had experienced these difficulties. In spite of this listening to the cassettes had been interesting, easy, nice, necessary, important and a quick way to study for most respondents. Seventy-three per cent of the respondents found audio cassettes to be a suitable means of continuing education for pharmacies.

Effects of the Programs on Knowledge Levels

In the simulation of the radio programs through audio cassettes the participants' knowledge levels in all three topics rose significantly higher ($P < 0.001$) immediately after the listening (Figure 1). Two weeks after the education, knowledge levels dropped to some degree compared to the results immediately after listening to the cassettes, but they still remained higher ($P < 0.05$) than before listening. Participants who had 20 years of practice or less, had better scores for the analgesics part than the older colleagues (35 per cent of the old participants, 73 per cent of the young ones had higher than average scores ($P < 0.05$)).

DISCUSSION

This series was not directed exclusively to pharmacies. This might have had some effect on the low response rate and listening activity. Despite the low listening activity to the programs people found it important to get education via

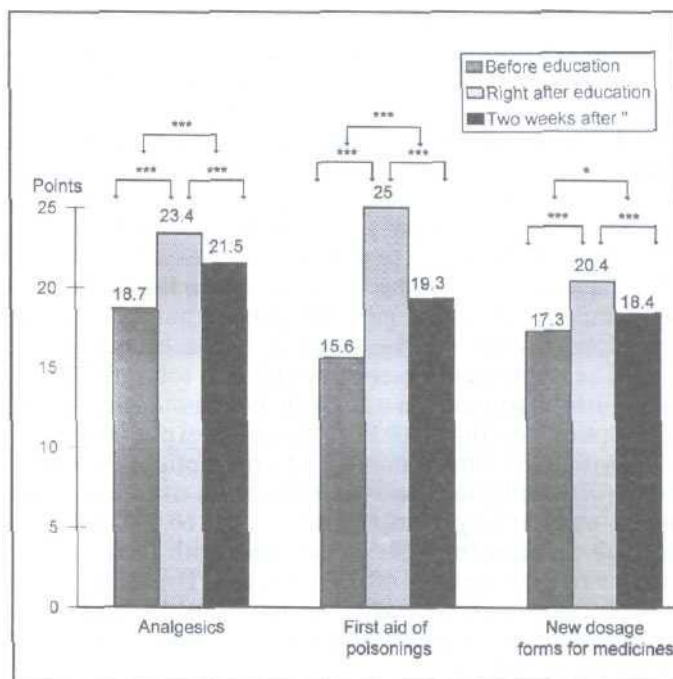


Fig. 1. Influence of education and passing of time on test results of participants' cognitive knowledge. Scores were measured before listening to the cassettes, immediately after and two weeks later ($n = 63-64$).

radio. But when this opportunity was given, they could not find the time to listen to the programs. In a study about preferred methods of continuing education(5). Smith and co-workers found radio to be the least attractive alternative.

Holmberg(6) discusses the choice of media for distance education, quoting his own research. Ninety percent of the respondents in Holmberg's study were satisfied with the radio portions of the education, but more than 50 percent of them were negative about television. This result is different from that of Smith and co-workers(5). Keeping financial and other limitations in mind, Holmberg suggests that radio and television be reserved for topics which cannot be dealt with entirely in writing.

Some of the programs in our study were considered fairly demanding. In spite of this, many respondents thought that the programs were very suitable for all radio listeners, not just pharmacy professionals. This was especially the case with those programs which were considered as quite easy. Perhaps some listeners had found it somewhat confusing whether the programs were directed mainly to the general public or to professionals. Directing the programs clearly to pharmacists might have led to more active participation by professionals. Such a restriction of audience might, however, be a disadvantage for the broadcasting company, even if it is not a commercial one.

Assistant pharmacists in the second part of our study did not find the three topics, which they had listened to, to be as valuable for maintaining their professional skills as did the participants in the first part of this study. However, more than 70 percent of the assistant pharmacists found each topic to be useful at least to some extent for keeping up professional skills. The better results from the first part in our study in this respect might be due to the fact that many participants of the first part were pharmacy students, who took the examination and probably found the programs helpful for passing the test.

Deterioration of the effects of education after two weeks was not a surprise, as it was also the case in a previous study(7), similarly Morrow and Hargie(8) found this effect in their study about communication skills training. Blank and his co-workers(9) who also evaluated audio cassettes in CE by using the same exam as a pretest and a posttest, with two month intervals, found significant changes in the participants' scores on the posttest as compared to those of the pretest. They also found that young pharmacists (10 years or less of practice) did better on the test than older pharmacists. This was the case only in one topic of our study.

According to a comprehensive literature review by Nona and co-workers(10) concerning the effectiveness of continuing education in the health professions, most education has been found to be effective. Miller and Jackson (11) also found multi-media education and traditional lectures to raise the participants' knowledge of the subject in question. Although the efficacy of continuing education in raising the participants' cognitive knowledge and influencing his/her behavior has been established. Boh and co-workers(12) were concerned about the pharmacists' ability to apply the information, gained from cassettes and computer education, in practice settings. The participants' opinions about the education in their study were identical in both the control (cassette) and in the experimental (cassette + computer) groups. However, the experimental group did better in the cognitive knowledge test and, more importantly, in a telephone simulation of patient cases. The results of our present study resemble those of the control group by Boh and co-workers(12). Computers would provide an important addition to the media available for continuing education, but they have not yet been used for professional education in Finnish pharmacies.

The positive features of audio cassettes as a medium of education were described by Duane already 20 years ago(13). The participants' evaluations in our study were also in most parts positive. The results of two studies by DeMuth (14,15), and those by Blank(9) and Boh(12) were, as a whole, positive and similar to ours: cassette tape recordings, in general, appear to be a convenient and time-saving means for professional continuing education.

The participants of our study seem to be satisfied with education mediated via radio or radio programs recorded on audio cassettes. Both ways can offer an alternative and an effective way to provide education to large audiences, whether people listen to a lecture at work or at home. However, the pharmacies in the audibility area of our study are usually open to either 5:00 PM or 6:00 PM except for those which are on-call. Thus, a limiting factor in the use of radio in continuing education is the broadcasting time of the programs, which depends mostly on the broadcasting company. This disadvantage can, however, be avoided by recording the programs on audio cassettes. Audio cassettes also offer the listener the possibility to listen to the program several times, which could clarify difficult parts and improve learning.

In the present study we showed that radio programs recorded on audio cassettes enhanced the participants' cognitive knowledge. However, we did not include the pharmacists' skills in effective patient counseling in this study. According to Holland (16), there is a strong positive relationship between the number of hours of continuing education per year and the frequency of patient counseling in community pharmacy practice. Active participation in continuing pharmaceutical education might also encourage Finnish pharmacists to provide more information to patients, which patients desire (17,18).

Am. J. Pharm. Educ., **60**, 374-377(1996); received 12/18/96, accepted 9/26/96.

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