

ORIGINAL ARTICLE

Continuing education programs for pharmacists: No one size fits all

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Abstract

This study aims to profile pharmacists based on their preferences for continuing education (CE) formats, and to investigate whether preferences for formats are associated with motivation to attend courses, preferences for topics and demographic traits. Data were gathered from a survey of 1032 Belgian community pharmacists. Cluster analysis generated three groups. Pharmacists not preferring lectures (cluster one; $n = 133$) were more likely to be older men, had the greatest interest in distance learning and were motivated by material incentives. Pharmacists interested in lectures as well as workshops (cluster two; $n = 595$) exhibited the highest intrinsic motivation to engage in CE. Pharmacists preferring lectures but not workshops (cluster three; $n = 304$) were more likely to be women and disliked active involvement in CE. This study shows that motivation to attend courses, preferences for topics, and demographic characteristics play a role in determining pharmacists' preferences for CE program formats.

Keywords: *Community pharmacists, continuing education, formats, motivation, survey*

Introduction

Continuing education (CE) programs can be delivered in a variety of formats to health professionals. These formats include live events such as lectures, workshops or hands-on-training; and distance learning formats such as printed materials, teleconferencing, audio recording and the Internet. Recent studies in Europe and the US have shown that health professionals generally prefer lectures and printed materials (Scott, Amonkar, & Madhavan, 2001; Harrison & Hogg, 2003; Maio, Belazi, Goldfarb, Philips, & Crawford, 2003; Stancic, Dolan Mullen, Prokhorov, Frankowski, & McAlister, 2003; Cordero et al., 2004; Haidet, Morgan, O'Malley, Moran, & Richards, 2004; Carter, Wesley, & Larson, 2005). Simultaneously, distance learning through the Internet, is gaining in popularity (Harden, 2005). According to Harden, irrespective of the format in which they are developed, CE programs should meet the

Convenient, Relevant, Individualized, Self-assessment, Interesting and Systematic (CRISIS) criteria in order to be effective, that is, they should be Convenient, Relevant, Individualised, including the possibility for Self-assessment, Interesting and Systematic (Harden & Laidlaw, 1992). To meet the criteria Convenience and Individualisation, pharmacists should be able to choose the CE format of their preference, at their time and place of preference (Harden & Laidlaw, 1992).

In Belgium, CE for community pharmacists is voluntary. The Institute for Permanent Study for Pharmacists (IPSA), the main CE provider in the Dutch-speaking part of Belgium, organises independent CE activities in co-operation with universities. These activities mainly rely on lectures. Currently, a debate is taking place to move away from a system of voluntary CE towards mandatory CE. In order to provide flexible learning opportunities under a mandatory system, a wider range of formats needs

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to be considered. Distance learning programs need to be developed in order that CE is accessible for every pharmacist. Interactive learning programs need to be developed in order to provide an active alternative for the passive lecture format, and because this format has been proven to be most effective in changing health professional behaviour (Thomson et al., 2001). However, in comparison to lectures, workshops and interactive web-based CE are costly and time consuming to design and provide (Davis et al., 1999). Therefore, from a CE provider point of view, it is desirable to have an idea of pharmacists' interest in these different formats.

The aim of this study is to profile Belgian community pharmacists based on their preferences for different CE formats. Thus, the objectives were, first, to cluster pharmacists according to their CE format preferences, and second, to investigate whether CE format preferences are related to motivation to attend CE courses, preferences for CE topics and demographic characteristics. These results can be used by CE providers to set priorities for the development of new CE formats, and to tailor those formats to pharmacists' profiles, in light of a possible move towards mandatory CE.

Materials and methods

Survey

Data for this study were gathered from a postal survey of community pharmacists who were registered members of IPSA. The survey was carried out in July 2003 and covered 1691 community pharmacists (about 27% of Belgian population of pharmacists). Information about questionnaire design, piloting and sampling has been previously reported (Driesen, Leemans, Baert, & Laekeman, 2005), but is briefly summarised here. The survey enquired about preferences for CE formats, motivation to attend CE courses, preferences for CE topics and demographic characteristics. Preferences for CE formats were elicited by measuring pharmacists' interest in lectures, interest in workshops, and interest in distance learning. Interest in lectures, interest in workshops, and preferences for CE topics were measured by means of a Likert scale. Interest in distance learning was quantified as a composite, continuous measure of pharmacists' interest in distance learning with different kinds of materials (Internet, CD-ROM, syllabus, video/DVD and audio CD).

Factor analysis

In the survey, motivation to attend CE courses was elicited by means of 18 variables reflecting facilitators of, and 15 variables reflecting barriers to, participation in CE courses. Factor analysis was used to reduce the 18 facilitators and 15 barriers to a smaller number

of factors that can be used in the analysis. The factor analysis was based on principal components analysis with varimax rotation (Staquet, Hays, & Fayers, 1998).

Cluster analysis

Cluster analysis identified clusters of pharmacists that differ according to their preference for three CE formats: lectures, workshops and distance learning. The agglomerative hierarchical clustering method starts with each pharmacist in a separate cluster and then aggregates clusters in such a way that pharmacists in the same cluster are similar in terms of their preferences for CE formats and pharmacists belonging to other clusters are dissimilar (Nixon, 2000). Given that different scales were used, variables were standardised by converting data to z scores. The best cluster solution was determined by the highest ratio of Bayesian information criterion changes and the highest ratio of log-likelihood distance measures (Zhang, Ramakrishnon, & Livny, 1996; Chiu, Fang, Chen, Wang, & Jeris, 2001). The cluster analysis generates a new categorical variable indicating the cluster membership of each pharmacist based on his/her preference for a CE format.

ANOVA and χ^2 analysis

We also investigated whether there is an association between preferences for CE formats as indicated by cluster membership on the one hand and motivation to attend CE courses, preferences for CE topics and demographic characteristics on the other hand. The association between cluster membership and the factors from the factor analysis was explored with analysis of variance. In case of a significant ANOVA, *post-hoc* comparisons were performed with the Bonferroni test (Agresti & Finlay, 1997). The association between cluster membership and variables not loading on a factor, preferences for CE topics and demographic characteristics was determined by the χ^2 test. Significant chi-square tests were interpreted with the help of adjusted standardised residuals (Agresti & Finlay, 1997). The different steps of the statistical analysis were performed in Statistical Package for the Social Sciences (SPSS), Statistical Analysis Software (SAS) and Linear Structural Equation Modelling (LISREL).

Results

Cluster analysis

After three mailings, the total response rate to the survey was 62.8% ($n = 1062$), resulting in 1032 valid cases. This sample of pharmacists could be clustered into three groups based on their interest in lectures, workshops and distance learning (see Table I). Cluster one consisted of 12.9% of community pharmacists

Table I. Cluster analysis of pharmacists by interest in lectures, interest in workshops and interest in distance learning.

Categorical variable	Total (n = 1032)		Cluster 1 (n = 133)		Cluster 2 (n = 595)		Cluster 3 (n = 304)		χ ² test	
	n	%	n	%	n	%	n	%	χ ²	p-value
<i>Lectures</i>										
Not at all interested/not really interested	133	12.9	133	100**	0	0**	0	0**	χ ² = 1032.000	<0.001
Rather interested/strongly interested	899	87.1	0	0**	595	100**	304	100**		
<i>Workshops</i>										
Not at all interested/not really interested	361	35.0	57	42.9	0	0**	304	100**	χ ² = 888.792	<0.001
Rather interested/strongly interested	671	65.0	76	57.1	595	100**	0	0**		
Continuous variable	Mean								F	Bonferroni
<i>Distance learning</i>										
0–15*	6.66		7.92		6.40		6.62		9.390	<0.001

Notes: X: significant ($p < 0.05$) difference between subjects in cluster 1 and cluster 2; Y: significant difference between subjects in cluster 2 and cluster 3; Z: significant difference between subjects in cluster 1 and cluster 3; **: |adjusted standardised residual| > 3 indicating great deviance from the null hypothesis of independence; *0 = not at all interested in distance learning via Internet, CD-ROM, syllabus, video/DVD and audio CD; 15 = strongly interested in distance learning via Internet, CD-ROM, syllabus, video/DVD and audio CD.

($n = 133$), cluster two contained 57.7% of pharmacists ($n = 595$) and cluster three was made up of 29.5% of pharmacists ($n = 304$). The first cluster reflected pharmacists who are not interested in lectures, but are significantly more interested in distance learning as compared with pharmacists in the other clusters. The second cluster of pharmacists was characterised by having an interest in lectures and workshops. The third cluster consisted of pharmacists who are interested in lectures, but not in workshops.

Factor analysis

Factor analysis reduced the 18 facilitators of participation in CE courses to three factors ($\chi^2 = 276$; $df = 86$; $p < 0.01$). The first factor “intrinsic motivation to participate in CE” consisted of the facilitators “keeping scientific knowledge up to standard”, “learning is pleasant”, “curiosity about new scientific information”, “keeping up professional ethics”, “receiving product information”, “moral duty to attend CE courses”, “gathering practical knowledge to improve information provision skills” and “job satisfaction”. The second factor “motivation by material incentives” was composed of the facilitators “personal invitation (for example, by medical representative)”, “receiving a present”, “catering” and “receiving gadgets”. The facilitators “keeping up with recently graduated colleagues”, “keeping up with experienced colleagues” and “compete with colleagues” made up the third factor “competition”. The facilitators “keeping in touch with colleagues”, “active participation in interactive sessions” and “receiving a syllabus” did not load on any factor.

The 15 barriers to participation in CE were reduced to two factors ($\chi^2 = 133$; $df = 43$; $p < 0.01$). The first factor “intrinsic inhibition” was made up of the barriers “following CE courses is unpleasant”, “passive lectures”, “don’t like it”, “nothing for my age”, “it’s not worth it”, “too specialised approach of subjects”, “you can always learn but it brings in too little” and “I don’t have the feeling I should continue to learn”. The second factor “transportation” consisted of the barriers “distance to the classes”, “lack of transportation” and “reluctance to make the trip”. The barriers “lack of time”, “coinciding with other activities”, “uninteresting topics” and “courses are not practice-oriented” did not load on any factor.

Facilitators for and barriers to participation in CE

The association between cluster membership and the factors facilitating or inhibiting participation in CE courses is presented in Tables II and III. Table II indicates that pharmacists interested in lectures as well as workshops (cluster two) exhibited the highest intrinsic motivation. They were also strongly motivated by social contact with colleagues, active

Table II. Clusters of pharmacists by interest for CE formats and facilitators of participation in CE courses.

	Total (n = 1032)		Cluster 1 (n = 133)		Cluster 2 (n = 595)		Cluster 3 (n = 304)		ANOVA		
	Mean		Mean		Mean		Mean		F	p-value	Bonferroni
<i>Intrinsic motivation</i>	3.9606		3.5842		4.0718		3.9076		28.680	<0.001	X, Y, Z
<i>Material incentives</i>	1.0887		1.4226		1.0536		1.0112		7.701	<0.001	X, Z
<i>Competition</i>	2.8036		2.6835		2.9027		2.6622		3.258	0.039	
									χ^2 test		
	n	%	n	%	n	%	n	%	χ^2	p-value	
<i>Keeping in touch with colleagues</i>											
Strongly motivating	222	21.5	29	21.8	153	25.7**	40	13.2**	38.057	<0.001	
Moderately motivating	594	57.6	71	53.4	351	59.0	172	56.6			
Not motivating	216	20.9	33	24.8	91	15.3	92	30.3**			
<i>Active participation in interactive sessions</i>											
Strongly motivating	120	11.6	19	14.3	95	16.0**	6	2.0**	134.486	<0.001	
Moderately motivating	474	45.9	59	44.4	325	54.6**	90	29.6**			
Not motivating	438	42.4	55	41.4	175	29.4**	208	68.4**			
<i>Receiving a syllabus</i>											
Strongly motivating	461	44.7	58	43.6	275	46.2	128	42.1	10.590	0.032	
Moderately motivating	443	42.9	55	41.4	263	44.2	125	41.1			
Not motivating	128	12.4	20	15.0	57	9.6**	51	16.8*			

Notes: X: significant ($p < 0.05$) difference between subjects in cluster 1 and cluster 2; Y: significant difference between subjects in cluster 2 and cluster 3; Z: significant difference between subjects in cluster 1 and cluster 3. *: |adjusted standardised residual| > 2 indicating deviance from the null hypothesis of independence; **: |adjusted standardised residual| > 3 indicating great deviance from the null hypothesis of independence.

participation in CE courses and receiving a syllabus. Compared to the other two clusters, the distance learning pharmacists (cluster one) set most motivation by material incentives and were, thus, more extrinsically motivated.

Table III shows that distance learning pharmacists experienced stronger barriers for attending CE courses. Lack of time, no practice-oriented courses and coincidence with other activities seemed to constitute more important impediments compared to the other clusters. For pharmacists in cluster two, the only explicit barrier was uninteresting topics, whereas cluster three pharmacists did not feel strongly motivated nor did they appear to experience strong impediments for attending CE courses.

Preferences for CE topics

More than 50% of pharmacists reported unsatisfactory or rather unsatisfactory knowledge of alternative medicine, psychiatric diseases, polypharmacy in the elderly, pharmacy management, detecting problems at the counter, drugs during pregnancy, selecting and classifying pharmacy-related documentation. There was no statistical difference between the three clusters regarding self-reported knowledge of these topics. Table IV outlines preferences for CE topics and their association with cluster membership. The top six of most wanted CE topics was the same for the three clusters. However, the self-reported need for CE on these topics differed significantly between clusters,

with pharmacists interested in lectures and workshops (cluster two) reporting the highest need, and pharmacists interested in distance learning (cluster one) showing least need for CE.

Demographics

Table V presents demographic data for each of the three clusters and investigates the relationship between cluster membership and demographic characteristics. The table shows that pharmacists not interested in lectures (cluster one) were more likely to be older than 44 years, male and a pharmacy owner. Pharmacists who preferred lectures but not workshops (cluster three) were more likely to be women.

Discussion

In Belgium, CE providers are designing and providing CE programs for pharmacists, in light of a potential move towards mandatory CE. This study aids the development and design of CE programs by eliciting the relation between pharmacists' preferences for different CE formats, and their motivation to attend CE courses, preferences for CE topics, and demographics features.

The majority of pharmacists in the study appreciated lectures as CE format. Although the effectiveness of such a traditional teaching method has been questioned by several researchers (Davis et al., 1999; Thomson et al., 2001; Bero et al., 2005), this CE

Table III. Clusters of pharmacists by interest for CE formats and barriers to participation in CE courses.

	Total (<i>n</i> = 1032)		Cluster 1 (<i>n</i> = 133)		Cluster 2 (<i>n</i> = 595)		Cluster 3 (<i>n</i> = 304)		ANOVA		
	Mean		Mean		Mean		Mean		<i>F</i>	<i>p</i> -value	Bonferroni
<i>Intrinsic inhibition</i>	1.1657		1.7511		1.0550		1.1263		31.898	<0.001	<i>X, Z</i>
<i>Transportation</i>	1.4869		1.6917		1.4346		1.4997		2.229	0.108	/
									χ^2 test		
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	χ^2	<i>p</i> -value	
<i>Lack of time</i>											
Keeps me from going	195	18.9	44	33.1**	86	14.5**	65	21.4	30.903	<0.001	
Makes it difficult to go	763	73.9	87	65.4*	460	77.3*	216	71.1			
No inhibiting factor	74	7.2	2	1.5*	49	8.2	23	7.6			
<i>Coinciding with other activities</i>											
Keeps me from going	145	14.1	36	27.1**	65	10.9**	44	14.5	35.806	<0.001	
Makes it difficult to go	527	51.1	55	41.4*	339	57.0**	133	43.8**			
No inhibiting factor	360	34.9	42	31.6	191	32.1*	127	41.8**			
<i>Uninteresting topics</i>											
Keeps me from going	657	63.7	72	54.1*	404	67.9**	181	59.5	15.236	0.004	
Makes it difficult to go	197	19.1	27	20.3	100	16.8*	70	23.0*			
No inhibiting factor	178	17.2	34	25.6*	91	15.3	53	17.4			
<i>Courses are not practice-oriented</i>											
Keeps me from going	175	17.0	35	26.3**	89	15.0	51	16.8	24.039	<0.001	
Makes it difficult to go	419	40.6	43	32.3*	274	46.1*	102	33.6**			
No inhibiting factor	438	42.4	55	41.4	232	39.0*	151	49.7**			

Notes: *X*: significant ($p < 0.05$) difference between subjects in cluster 1 and cluster 2; *Y*: significant difference between subjects in cluster 2 and cluster 3; *Z*: significant difference between subjects in cluster 1 and cluster 3. *: |adjusted standardised residual| > 2 indicating deviance from the null hypothesis of independence; **: |adjusted standardised residual| > 3 indicating great deviance from the null hypothesis of independence.

Table IV. Clusters of pharmacists by interest for CE formats and TOP 6 of preferred CE topics.

	Total (n = 1032)		Cluster 1 (n = 133)		Cluster 2 (n = 595)		CLUSTER 3 (n = 304)		χ^2 test	
	n	%	n	%	n	%	n	%	χ^2	p-value
<i>Information provision on first drug issue</i>										
High priority	792	77.9	82	63.1*	472	80.5*	238	79.1	26.347	<0.001
Low priority	191	18.8	36	27.7*	99	16.9	56	18.6		
No need	34	3.3	12	9.2*	15	2.6	7	2.3		
<i>Detecting problems at the counter</i>										
High priority	797	77.8	88	67.7*	483	81.6*	226	74.8	19.210	0.001
Low priority	214	20.9	37	28.5*	104	17.6*	73	24.2		
No need	13	1.3	5	3.8*	5	0.8	3	1		
<i>Drugs during pregnancy</i>										
High priority	655	65	73	55.7	378	65.4	204	68.5	9.521	0.146
Low priority	303	30.1	47	35.9	175	30.3	81	27.2		
No need	48	4.8	11	8.4	24	4.2	13	4.4		
<i>Polypharmacy in the elderly</i>										
High priority	651	64.5	68	51.9*	406	70*	177	59.2*	20.520	<0.001
Low priority	323	32	56	42.7*	157	27.1*	110	36.8*		
No need	36	3.6	7	5.3	17	2.9	12	4		
<i>Pediatric diseases</i>										
High priority	646	64	69	53.1	387	66.4	190	64.2	9.123	0.058
Low priority	326	32.3	53	40.8	178	30.5	95	32.1		
No need	37	3.7	8	6.2	18	3.1	11	3.7		
<i>Psychiatric diseases</i>										
High priority	610	60.6	65	50.4*	356	61.3	189	63.6	10.123	
Low priority	367	36.4	56	43.4	210	20.9	101	34		
No need	30	3	8	6.2*	15	2.6	7	2.4		

Note: *: |adjusted standardised residual| > 2 indicating deviance from the null hypothesis of independence.

format is still mostly used for pharmacists in Belgium. However, more than half of pharmacists in the study showed an interest in workshops, which have been shown to be more effective in producing practice change (Thomson et al., 2001). Pharmacists who showed an interest in workshops also exhibited the highest motivation to participate in CE courses. Therefore, developing workshops may be worthwhile, both in terms of willingness to participate as well as sustained learning outcomes.

For the minority of pharmacists who were not interested in lectures (cluster one pharmacists), distance learning could provide an alternative CE

format. However, these pharmacists were least motivated and were less concerned about CE. Nonetheless, the analysis of the motivation to attend CE courses indicated that material incentives could serve as an instrument to incite these pharmacists to participate in distance learning activities. In his survey on web-based training practices, Bonk found that besides lack of time, lack of incentives was the most important reason for dropout from web-based courses (Bonk, 2002). In a CE setting, an incentive could be the allocation of credit points upon successful completion of the e-learning course. For example, in the US, Germany and Australia, upon successful

Table V. Clusters of pharmacists by interest for CE formats and demographic characteristics.

	Total (n = 1032)		Cluster 1 (n = 133)		Cluster 2 (n = 595)		Cluster 3 (n = 304)		χ^2 test	
	n	%	n	%	n	%	n	%	χ^2	p-value
<i>Age (years)</i>										
≤44	598	57.9	65	48.9*	355	59.7	178	58.6	5.260	0.072
>44	434	42.1	68	51.1*	240	40.3	126	41.4		
<i>Employment position</i>										
Staff pharmacist	512	49.6	51	38.3*	300	50.4	161	53.0	8.272	0.016
Owner pharmacist	520	50.4	82	61.7*	295	49.6	143	47.0		
<i>Gender</i>										
Male	303	29.4	52	39.1*	179	30.1	72	23.7*	10.953	0.004
Female	729	70.6	81	60.9*	416	69.9	232	76.3*		

Note: *: |adjusted standardised residual| > 2 indicating deviance from the null hypothesis of independence.

completion of an accredited e-learning course, pharmacists can earn credit points which they may accumulate to fulfill re-registration criteria or to obtain a CE certificate (Accreditation Council for Pharmacy Education, 2005; Federal Pharmacists' Chamber, 2006; Pharmaceutical Society of Australia, 2006).

The association between pharmacists' demographic features and interest in different CE formats was explicit for cluster one pharmacists. Our results suggest that those pharmacists are more likely to be male and pharmacy owner. Conversely, the distinction between cluster two and cluster three pharmacists on demographic characteristics was not explicit. More demographic information, for example, scale and location (rural, urban) of the pharmacy, and university of graduation, might be needed in order to more accurately profile the target groups when developing and optimising lectures and workshops.

This survey was carried out in a country where CE is not mandatory. In Belgium, CE providers are very much interested in attracting more pharmacists by tailoring their programs as much as possible to the needs of pharmacists. This may be a less important concern in countries where CE is mandatory. However, even for countries where CE is mandatory, this study adds value because it provides the methodology for promoting different CE formats according to pharmacists' interests, demographic characteristics and motivation.

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