Factors Influencing Participation in Continuing Professional Development: A Focus on Motivation Among Pharmacists

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Introduction: The interest in continuing education (CE) for pharmacists has increased because of patient safety issues, advancing science and the quick changes in the profession. Therefore, contemporary pharmaceutical care requires an effective and sustainable system for pharmacists to maintain and improve competencies. Although motivation plays an important role both as a facilitator (desire to learn) and a barrier (lack of motivation), there is little investigated about this specific factor. The aim of the study was to explore what factors influence pharmacists' participation in CE with a focus on motivation.

Methods: The theoretical framework was self-determination theory (SDT), which describes autonomous motivation (AM) representing motivation from an internal locus of causality, controlled motivation (CM) originating from an external locus of causality, and relative autonomous motivation (RAM) that measures the AM in an individual after correcting for the CM. The relationship between pharmacists' characteristics, especially their motivation (AM, CM and RAM) in CE, and their participation in CE activities was explored using the AMS-questionnaire and the Dutch online portfolio system.

Results: RAM was positively correlated with CE participation of pharmacists and explained 7.8% of the variance. The correlations between the independent variables AM and CM and CE hours were negative (−0.301 and −0.476, respectively). Other factors influencing CE participation were pharmacy school (6.8%), traineeship (10.9%), and work experience (7.8%). Pharmacists participated for 27.0 hours on average in CE during 11 months and preferred face-to-face-learning (85.5%) above e-learning (13.8%).

Discussion: Our findings show a positive relationship between RAM and CE participation. The current CE system is probably not conducive to stimulation of AM. Further research is needed to understand the factors that stimulate pharmacists' motivation and participation in CE.

Keywords: academic motivation scale, self-determination theory, motivation, pharmacists, lifelong learning, continuing education, continuing professional development, maintenance of licensure, performance improvement CE, program planning/curriculum

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Contemporary health care requires an effective and sustainable system that allows health professionals to maintain and improve their competencies. A majority of these professionals are accustomed to participating in continuing education (CE) in the form of conferences and meetings. However, health professionals are increasingly expected to be more self-directed in their learning. For example, in countries such as New Zealand, Great Britain, Canada, United States, systems and programs have been created to encourage continuous improvement via practice assessment, reflection, and planning lifelong learning—an approach that is sometimes termed as *continuing professional development (CPD)*.[1,2] Given the higher level of self-directedness that CPD requires, the importance of the role played by motivation has gained greater recognition.[3]

The context of the study described in this article is pharmacy practice in the Netherlands, which has changed extensively in the last decade. Dutch politicians and an aging population with internet access to medical information are demanding an affordable, sustainable, and high-quality pharmaceutical care focusing on patients' participation in the responsibility of their treatment and preventive care. This has required development of a more structured educational system for pharmacists to maintain and improve their competencies. In January 2015, the Royal Dutch Pharmaceutical Society (KNMP) responded to this need by implementing stricter regulations.[4] These regulations demand a focused approach to CE and require the development of core competencies like collaboration and communication derived from the CanMEDS model.[5] The

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success of this system and all other international CE systems rests heavily on health care professionals' active engagement in their CE. In our view, an essential step in ensuring that the desired level of engagement is realized is understanding the underlying mechanisms of pharmacists' motivation to learn and explore the relationship of their motivation with their participation in CE.

For more than 20 years,[6–15] researchers have sought a better understanding of how motivation and other factors affect pharmacists' beliefs, attitudes, preferences, and participation in CE and CPD. These studies have identified many factors that influence the participation of pharmacists in continuing education.[14] Based on self-report methods for CE and CPD, Mottram et al[6] and Power et al[13] found that community pharmacists participated for 30 and 40 hours, respectively, and hospital pharmacists participated for about 45 and 66 hours, respectively, per year. Facilitating factors include the personal desire to learn and enjoyment/relaxation experienced by learning as a change of pace from the "routine." Another facilitator for CE participation is maintenance of pharmacists' practice license. On the contrary, factors such as too little time, high costs, lack of motivation, or interest and negative attitudes toward the compulsory nature of CE operate as barriers. For CPD, additional barriers like lack of understanding of the concept and technical problems have been described.[14]

Although motivation plays an important role as both a facilitator and a barrier, little is known about this specific factor. We recently reported on a study that identified the motivational profiles exhibited by pharmacists regarding CE,[16] but how these profiles affect their CE participation has not been investigated. The aim of the present study was to deepen our understanding of how various factors, especially motivation, are related to CE participation by pharmacists (as measured by hours invested in CE courses).

METHOD

Educational and Practice Context

Annually, about 200 pharmacists graduate from the two pharmacy schools (Utrecht and Groningen) in the Netherlands.[17] Dutch pharmacists work predominantly as community (approximately 2900),[17] hospital (approximately 550),[18] and outpatient (number unknown by the organization of outpatient pharmacists) pharmacists. Pharmacy graduates can participate in a 2-year or 4-year residency to become a community or hospital pharmacist, respectively. To work in an outpatient pharmacy, registration as a community pharmacist is sufficient. To maintain their license to practice, all pharmacists must reregister every 5 years and participate in a total of 200 hours of accredited CE courses.

CE activities for pharmacists are assessed by the Commission of Experts for accreditation. CE providers are expected to organize preapproved activities like workshops, conferences, and e-learning. They have to fill out accreditation applications and send these to the committee at least two months prior to the activity. Additionally, there are CE activities like international conferences, pharmacotherapeutic sessions with general practitioners, writing and teaching which can also be accredited afterward through individual application by the Commission of Experts.

Accredited CE activities for pharmacists are registered in an online portfolio system managed by the Royal Dutch Pharmaceutical Society. Preapproved activities are assigned identity numbers; nonpreapproved activities are not.

Study Participants/Recruitment

The sampling frame for this study was 831 registered community, hospital, outpatient, and other pharmacists participating in CE courses organized by the Netherlands Centre for Post-Academic Education in Pharmacy from September 2013 to December 2013. For pharmacists employed in the Netherlands' pharmaceutical industry, universities, CE providers and organizations like inspection and regulatory affairs, there are no structured CE programs and they were accordingly excluded from the study.

Information about the research was presented by the researchers to the pharmacists and the participants signed an informed consent that included their permission to be approached for further research. Because we wanted to relate participants' motivation to their participation in CE, we asked the participants' permission to access their online portfolios, which include detailed records of participation in registered CE activities.

Theoretical Framework

Self-determination theory (SDT)[19] has been used in medical and pharmacy education to study motivation.[16,20] This theory describes motivation as a continuum (Figure 1) that

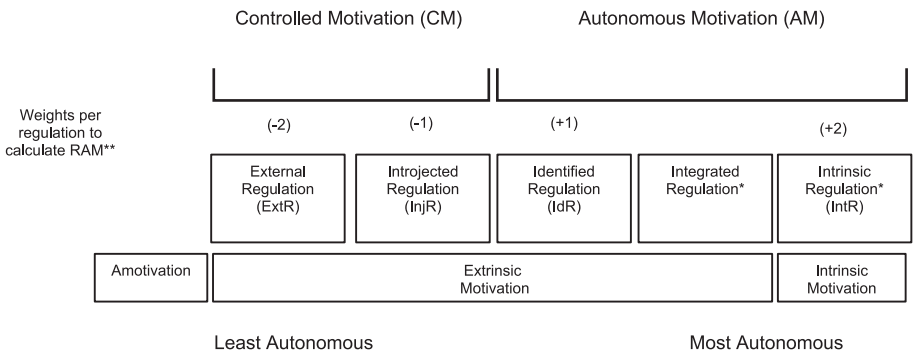

FIGURE 1. The self-determination continuum with autonomous motivation (AM) and controlled motivation (CM) and relative autonomous motivation (RAM), adapted from Deci and Ryan.[19] *Integrated and intrinsic regulation share the same quality in practice; therefore, these two types of regulations are measured through intrinsic motivation. **Relative autonomous motivation (RAM) = (−2xExtR) + (−1xInjR) + (1xIdR) + (2xIntR)

ranges from Amotivation (supremely left) to Intrinsic Motivation (supremely right).

In this continuum, extrinsic motivation is defined by four types of regulation 1) external regulation, where an activity is done to receive a reward or avoid punishment, 2) introjected regulation, where the activity is performed to avoid guilt or to attain feelings of self-worth, 3) identified regulation, when a person identifies with the activity and personally endorses it, and 4) integrated regulation, which shares many qualities with intrinsic motivation and where the activity is part of the self because it is considered personally important. External regulation is considered to be the least autonomous and integrated regulation to be the most autonomous form.

Based on this continuum, two main types of motivation can be determined 1) autonomous motivation (AM), described as generating from within an individual and 2) controlled motivation (CM) as generating from external factors.

High scores on AM are positively associated with better educational outcomes like better learning strategies and academic performance and also positive well-being[19–21] High scores on CM are positively associated with behaviors like procrastination, surface level learning, and test anxiety.[21–23]

Several studies have found that the combination of AM and CM provides a better understanding of the effect of motivation on learning outcomes than AM or CM separately.[16,22–24] The combination of AM and CM has also been used to identify motivational profiles of individuals in different populations.[16,24–26]

AM and CM can also be combined by assigning weights to the different types of regulation of motivation and creating a new single variable: the relative autonomous motivation (RAM) measure, which is an index of an individual's autonomous motivation after correcting for the controlled motivation. RAM indicates how AM and CM are related within an individual and has been used and validated as a variable to relate motivation to study performance.[23,27–29]

Both AM and CM will stimulate CE participation, but we expect CM to drive a certain type of CE participation behavior such as collecting the obligatory credits predominantly through participation in conferences and meetings. Therefore, CM could be a barrier to participating in more challenging CE activities like workshops and officially organized peer assessments. Our hypothesis is that pharmacists with a high score on RAM will participate in more CE activities.

Instrument and Variables

For this study, the Academic Motivation Scale (AMS),[27,30] a 28-item scale, based on SDT, was adapted to a Dutch version, measuring the contextual motivation of the pharmacists for CE. This scale has been standardized and frequently validated (Cronbach's alpha from 0.77 to 0.90) for higher education.[27,28,30] We used the following steps from adaptation guidelines[31] for questionnaires for creating the Dutch version: 1) translation from English into Dutch, 2) pretesting the translated version with five experts, 3) resolving any discrepancies, 4) creating a back translation using a native English speaker, and 5) checking for discrepancies with the original English version and producing the final version.

A five-point Likert scale was used for the motivation scores, on which one represented "strongly disagree" and five represented "strongly agree." Demographic information that was earlier shown to be related to motivation like gender, age, and work experience was also collected. AM was calculated by averaging the scores of intrinsic motivation and identified regulation. CM was calculated by averaging the scores of introjected regulation and external regulation. Relative autonomous motivation (RAM) was calculated by assigning different weights to the different types of motivation and summing these scores: Intrinsic motivation (+2), identified regulation (+1), introjected regulation (−1), and external regulation (−2) (see Figure 1).

Participation in CE

For the pharmacists who gave us permission to access their portfolio, we extracted every CE activity for a period of 11 months starting from the day they completed the questionnaire. We found this period of time (approximately one year) gave us a sufficiently detailed overview of pharmacists' CE participation. Considering the large variability that would be introduced by including nonpreapproved CE activities, only activities with prior requested accreditation and an identity number were included in the data.

Initially, we planned to categorize the courses on additional characteristics like degrees of interactivity (eg, conferences versus workshops versus peer review) and group size; however, the information required for this analysis was not available in the portfolios. Moreover, we found a great amount of variability among accredited CE activities listed in the portfolios. As a result, we elected to focus on the number of CE hours. We did find in the information provided online by the CE providers' data allowing us to compare face-to-face learning and e-learning. This gave us additional information about the preferred learning method of pharmacists.

Statistical Analysis

The relationship between the dependent variable (number of total CE hours spent in 11 months) and a large number of potential predictor variables was explored with multiple regression analysis using SPSS, version 20 or 23. RAM was used as a continuous variable; dummy variables were created for gender (1 = male, 0 = female), pharmacy school (1 = Utrecht, 0 = other), work experience (1 = more than 10 years, 0 = less than 10 years), and traineeship (1 = in training, 0 = not in training).

Various combinations of predictor variables were tested by interactive (backward, forward stepping) and best subset regression analysis. Selection of the best fitting model was based on analyses of variance *F*-tests and on the percentages of explained (total and predictor unique) variances. The assumptions of distribution normality and absence of collinearity were tested by inspection of normal P-P plots and variance inflation factors (VIF), respectively. Independence of the effects of the predictor variable RAM and the various dummy variables was tested with an analysis of covariance in which RAM was used as a covariate (test of parallel lines). Because our sample size was strongly restricted, there may be some limitations regarding the required power. Therefore, the observed power for the total analysis and each individual predictor variable effect were calculated using G*power3, together with Cohen's effect sizes.[32]

Ethical Approval

This study was approved by the Ethical Review Board of the Dutch Medical Education Association (NVMO)—(file 262).

RESULTS

A total of 432 of the 831 pharmacists (57.5%) completed the questionnaire. Of the 432 pharmacists contacted an average of 8 months later, 78 gave their permission to access their online portfolio. We were able to extract course data from only 66. Eleven cases were lost due to no registration of the online portfolio number and unreadable informed consent forms. From the 66 cases, we identified one outlier with a total of 133 accreditation hours and excluded it, leaving a final total of 65 cases for the analyses. A comparison of the demographics of our final sample to the larger population (425 participants; Table 1) demonstrates reasonable representativity of our study.

Table 2 presents the number of hours of the different ways in which CE hours were collected by the participants in 11 months. The participants in this study collected an average of 27.0 CE hours in 11 months. The proportion of hours from face-to-face learning (85.5%) was several times larger than from e-learning (13.8%). The face-to-face learning consisted of large group events (n = 100–1400) like congresses and symposia, and mid-size (n = 50) and small-group (n = 12–25) sessions like seminars and workshops. We identified 172 unique CE activities (110 face-to-face and 62 e-learning) in total. The category "other" consisted of hours spent on homework assignments combined with face-to-face learning activities.

After an introductory multiple regression analysis including all independent variables (gender, pharmacy school, work environment, work experience, traineeship, pharmacy ownership and RAM), we found that using the combination of pharmacy school, work experience, traineeship and RAM leads to the most parsimonious model in which 45% of total variance is explained by the predictor variables (Table 3). Continuous variables (CE hours, RAM) were normally distributed and no indication of collinearity was seen (all VIF's < 1.6).

TABLE 1.

Demographics of the Participants (N = 65) in Comparison with the Larger Population (N = 425)

Factor Variable	This Study, n (%)	Large Population, n (%)
Gender		
Females	45 (69.2)	245 (57.6)
Males	20 (30.8)	147 (34.6)
Unknown		33 (7.8)
Pharmacy school		
Utrecht	40 (61.5)	220 (51.8)
Groningen	22 (33.8)	165 (38.8)
Other or unknown	3 (4.6)	41 (9.6)
Work environment		
Community pharmacy	38 (58.5)	220 (51.8)
Hospital pharmacy	24 (36.9)	193 (45.4)
Other or unknown	3 (4.6)	12 (2.8)
Work experience		
>10 y	30 (46.2)	160 (37.6)
<10 y	35 (53.8)	260 (61.2)
Unknown		5 (1.2)
Traineeship		
Not in training	52 (80)	285 (67.0)
In training	13 (20)	118 (27.8)
Unknown		22 (5.2)
Employment		
Owner	5 (7.7)	44 (10.4)
Employee	59 (90.8)	355 (83.5)
Unknown	1 (1.5)	26 (6.1)

TABLE 2.

Mean (and Standard Deviation) Hours per Type of CE in 11 months

	Face-to-Face-Learning	e-Learning	Other	Total CE Hours
Mean	23.06	3.72	0.185	26.97
N	65	65	65	65
Std. Deviation	17.22	7.40	1.49	18.8

The fitted model indicates that pharmacists' participation in CE has a constant of 16.7 hours (B) on average and that a longer work experience or higher RAM leads to an increase of the hours spent on CE. *Pharmacists in training* and *pharmacists who studied in Utrecht* spend 14.4 and 7.8 hours less on CE compared to pharmacists-not-in-training or pharmacists who studied elsewhere (mainly Groningen), respectively. The predictor variables each explain between 6.8% and 10.9% of the total variance. The effect of RAM was independent of the other (dummy) variables.

The overall effect size (0.82) can be considered large, while the effect size of 3 out of 4 dummy variables are medium (according to Cohen's criteria). The observed power for each predictor effect was >0.80, except for the dummy variable "work experience" (0.43). (see Table 3).

The correlations between the different motivational variables (AM, CM, and RAM) and the total of CE hours were calculated with Pearson's correlation. AM and CM were both negatively related to CE hours (-0.301, $P < .05$ and -0.476, $P < .01$, respectively). RAM was positively related to CE hours (0.399, $P < .01$).

Because we found a negative correlation between AM and CE hours, we decided post hoc to collect qualitative data to know what was behind the results. We selected cases with high scores on AM (range from 3.50 to 4.41 compared to the average score of 3.36) and with a negative predictor on CE hours like traineeship, work experience less than 10 years, and pharmacy school (Utrecht versus Groningen) for a telephone interview. Questions we asked during the interviews were:

1. What do you think of the current CE system in terms of variety and educational methods from the offered courses?
2. How does this system connect to the knowledge and competencies provided by the pharmacy school, which you have graduated from?
3. What made you decide to participate in CE?
4. What are the characteristics of a future CE system that could stimulate your motivation for CE lifelong?

Major findings from our analysis of the interview data are presented in Table 4. Most interviewees were satisfied with the diversity of the offered CE courses; some found the educational format of most courses to be outdated and would appreciate a more contemporary approach like blended learning (a mix of online courses and face-to-face meetings). Although e-learning seemed to be convenient, meeting their peers was an important reason to participate in CE courses. This probably explains why we found that the participation in e-learning was just about 14% of the total participation in CE. To answer the question

TABLE 3.
Multiple Regression Model Explaining Participation in CE

Predictor Variable	*B* ± SE, h	β	*P*	sr (% Variance)	Effect Size	Observed Power
Constant	16.7 ± 7.4		.03			
Study location (dummy = 1: Utrecht, 0: other)	−7.8 ± 3.8	−0.20	.04	−0.26 (6.8)	0.15	0.87
Work experience (dummy = 1: >10 y, 0: <10 y)	9.3 ± 4.2	0.25	.03	0.28 (7.8)	0.05	0.43
Traineeship (dummy = 1: in training, 0: not in training)	−14.4 ± 5.3	−0.31	.01	−0.33 (10.9)	0.19	0.84
Relative autonomous motivation (RAM) (continuous variable)	2.2 ± 1.0	0.23	.03	0.28 (7.8)	0.14	0.85

B, unstandardized regression coefficient (±SE, in hours); **β**, standardized regression coefficients; *P*, statistical significance of the regression coefficient; sr, semipartial correlation between predictor variable and dependent variable. The percentage of variance, explained uniquely by the predictor variable, is given between brackets (sr^2). Overall, the combination of the four predictor variables explained 45% of the variability in the number of CE hours, $R^2 = 0.45$, adjusted $R^2 = 0.39$, $F_{4,61} = 11.21$, $P < .001$, effect size = 0.82, observed power >0.99.

Results of the multiple regression analysis with the dependent variable: total of CE hours participated in 11 months and with independent variables: RAM, traineeship, work experience and pharmacy school.

"What would your ideal (future) CE system look like?", one pharmacist recommended a central portal for all CE courses to make life easier for pharmacists and different choices in the levels of difficulty or challenges in CE courses.

In the interviews, when asked about the current CE system, the participants did not mention any factors which showed that autonomy and competence needs are fulfilled in the available CE courses. We did find evidence indicating that the current courses are often selected for their interesting content which is important for AM. On the other hand, their worries about the constraints of the future CE system could also hamper AM.

DISCUSSION

Our study builds on previous research on pharmacists' attitudes and participation in CE. We explored how actual registered CE hours rather than self-assessment scores relate to pharmacists' motivation in the context of CE.

In studies based on interviews and questionnaires, pharmacists have reported dedicating about 30 to 40 hours per year to CE/CPD.[6,7,13,14] Our findings of an average of 27.0 CE hours in 11 months (extrapolated to 29.4 CE hours in 12 months) are in alignment with the group of pharmacists reporting about 30 hours, but suggest over reporting from respondents that reported spending a median of 40 hours or more per year on CE/CPD. Even when we would have included the non-preapproved CE activities, which would have resulted in an extrapolated average of 32.7 CE hours in 12 months, we could not replicate this amount of CE hours. These findings could emphasize the methodological weakness using self-report methods to study CE/CPD participation.

Our findings suggest a positive relationship between pharmacists' RAM and their CE participation and therefore support our hypothesis. We did not expect to find a negative relationship between AM and CE hours, however. From the interviews we can conclude that even if the current CE system meets most of the needs of the pharmacists, the absence of factors fulfilling autonomy and competence could explain why AM was negatively associated with CE hours. Interviewees' wishes for the characteristics of a future CE system (eg, custom made courses, indicative assessments) endorse this possible explanation.

Theoretically, high scores on CM might be expected to result in higher participation in CE because of the obligatory system in the Netherlands. Nonetheless, we found that CM was negatively related to CE hours. We think pharmacists with a high score on CM prefer to collect their CE credits with activities outside the structured CE courses, like pharmacotherapeutic consultations and other meetings including professional content, because they are easier to access and mostly offered free of charge. Since those activities did not have an associated CE identity number, we were unable to include them in our study.

From the interviews, we could not explain why "pharmacy school" was a factor that played a role in CE participation. The difference in focus of education of the two pharmacy schools (Utrecht—more patient-centered and Groningen—more analytical) could explain why graduates from Utrecht participate less in CE in comparison with graduates from Groningen, in particular. The former graduates are probably more prepared for the current patient-centered pharmacy practice in the Netherlands. Since the available data do not provide complete information with respect to the content of the courses, we could not investigate if this difference was due to graduates from Groningen participating in more patient-centered courses.

A possible explanation for the negative relationship between the factors *pharmacists in training* and *work experience for less than 10 years* and CE participation is that the *pharmacists in training* group participates in an obligatory program in which there is little room for CE courses. Additionally, the *work experience for less than 10 years* group just finished the program and started their professional life, which perhaps demanded other priorities than CE. This was confirmed by one of the interviewed pharmacists. In an earlier study, we had found that the *pharmacists in training* group was represented the most in the high-quantity motivation (high scores on both AM and CM) profile.[16] This particular profile scored relatively higher on CM (in comparison with AM) which could indicate that this group also participates less in CE because they are not obliged to collect CE credits (a controlled motive) yet.

From all factors influencing pharmacists' CE participation, motivation is the only factor that can be influenced and this can be achieved through creation of an autonomy supportive educational environment.[33]

Based on our findings, we think that the value of AM and CM as independent predictors for CE participation should be studied in further research. More insight into the causes and mechanisms of change of motivation in time and the relationship with other circumstances (eg, motivation for work) is required for developing a sustainable CE system that engages pharmacists in lifelong learning.

Other research questions raised are: 1) Are circumstances like motivation for work, satisfaction of the basis psychological needs regarding the current CE system and professional development related to pharmacists' motivation for CE? And how? 2) What are the characteristics of an autonomy-supportive educational system that could engage pharmacists in lifelong learning?

TABLE 4.

Questions and Results (Including Quotes of the Interviewees) of the Semistructured Interviews (*n* = 8)

1) What do you think of the current CE system in terms of variety and educational methods from the offered courses?
   The current system
      Pharmacists are worried about the constraints of the (new) regulations, which seems to be yet unclear, but agreed that a more distinctive accreditation (eg, higher quality activities versus international conferences) could be helpful.
      "There are two types of pharmacists. The ones who participate in international conferences like EAHP and collect a lot of accredited points and do not participate in local CE anymore. These conference activities are content-wise not of the best quality accredited points (do not lead to good learning). And others who cannot participate in those conferences due to circumstances."
   The variety of offered courses
      Pharmacists find the offered variety and level of courses satisfying, except for pharmacists working at specific jobs like the manufacturing site of the hospital pharmacy.
      "I am a compounding pharmacist and I can't find courses about parenterally administered food and manufacturing of medicines."
   Educational methods
      Most pharmacists didn't have any comments about the educational methods of the current system, although the possibilities of e-learning besides face-to-face learning were very welcome and blended learning, interprofessional education and more interactive CE courses would be preferred.
      "I think it is convenient to be able to participate in e-learning besides face-to-face learning. It's often a problem for me to be away from my pharmacy for participating in CE."
      "I like interactive courses based on cases from pharmaceutical practice."
2) How does this system connect to the knowledge and competencies provided by the pharmacy school, which you have been graduated from?
   Community pharmacists didn't experience hurdles between their knowledge and competencies provided by the pharmacy school and CE activities afterward. However, pharmacists working in a hospital experienced gaps in their knowledge and competencies to do their job properly. This can be solved partly by the training for hospital pharmacists and specific CE activities.
   "It partly connects with my needs, but I experience a gap in knowledge and skills for hospital pharmacists like myself."
3) What makes you decide to participate in CE?
   Factors in terms of the content were: Interesting and challenging activities, combination of pharmacotherapeutic knowledge with skills like communication, theme of the activity, applicable in practice.
   Practical factors mentioned were: location of the CE activity, names of experts, perceived value for money, possibility to mix with e-learning.
   But also meeting their peers and interdisciplinary education were facilitators for CE participation.
   "I choose CE based on what I need in practice, sometimes because of a certain expert and if the event is multidisciplinary. My choice is not based on the attached accreditation points."
4) What are the characteristics of a future CE system that could stimulate your motivation for CE lifelong?
   A future system according to the 8 interviewees should have the following characteristics:
      1) Slides and schemes of the followed courses should be kept accessible for the participants
      2) A system is needed which help you find the course you desire and to store information about the courses you have already participated in
      3) Blended learning, interactivity, and multidisciplinary nature were mentioned as important facilitators for the future courses
      4) Different (custom-made) levels of courses, a core curriculum (but not too demanding), and indicative assessments were also mentioned as possible wishes for the future CE system
   "My ideal system would work like 'Google'. The system would remember which courses you've participated in and should send you notifications. A diagnostic assessment would be very welcome and more e-learning and blended learning."

Limitations

Due to incomplete information on the course characteristics, our categorization of the courses may not have been robust. With new regulations from January 2015,[4] courses are categorized according to the CanMEDS[5] competencies. Future research could benefit from this.

Not all CE activities like pharmacotherapeutic consultations and other meetings including international conferences were included. Therefore, it is likely that the pharmacists had earned more credits than we included in our study. However, including those additional hours would introduce a certain bias in the data for 3 reasons: 1) not every pharmacist could participate in international conferences, 2) the lack of uniformity of preapproved accredited activities was already a problem and we would introduce more variability to our data, and 3) some of the registered hours were pending for accreditation afterward and we could not foresee if they would have been accepted or declined because we depended on "snapshots" of their portfolios.

Because we had only 65 complete cases, the results may be less accurate due to the small sample size and the large variance in the CE hours the pharmacists participated in. We recommend further research in pharmacists' motivation for CE including actual CE credits to confirm our findings and using paper surveys to increase the response rate.

Notwithstanding the methodological shortcomings of our study, we think it contributes to research on CE in health professionals and especially pharmacists. Our study exposes a gap of the current documentation of the CE system for pharmacists in the Netherlands. We found a lack of standardized registration and documentation of accredited CE activities. Our findings call for a standardized and uniform documentation of accredited CE activities and performance of pharmacists. With the current Dutch CE system, we could only study variables such as CE hours. This study will benefit from being conducted in other contexts like, for example, Canada or Great Britain, where the system is better documented and pharmacists are reviewed based on an ongoing CPD cycle.[1]

Conclusion

RAM is a positive predictor of pharmacists' participation in CE. Other factors that influence pharmacists' participation in CE are pharmacy school, work experience, and traineeship.

Lessons for Practice

- Relative autonomous motivation is a positive predictor for participation in CE.
- Pharmacy school, work experience, and traineeship also play a role in pharmacists' participation in CE.
- The current CE system is probably not conducive of stimulating AM of pharmacists in CE.

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