Unraveling Motivational Profiles of Health Care Professionals for Continuing Education: The Example of Pharmacists in the Netherlands

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Introduction: Continuing education (CE) can support health care professionals in maintaining and developing their knowledge and competencies. Although lack of motivation is one of the most important barriers of pharmacists' participation in CE, we know little about the quality or the quantity of motivation. We used the self-determination theory, which describes autonomous motivation (AM) as originating from within an individual and controlled motivation (CM) as originating from external factors, as a framework for this study. Our aim was to obtain insight into the quality and quantity of pharmacists' motivation for CE.

Methods: The scores of 425 pharmacists on Academic Motivation Scale were subjected to K-means cluster analysis to generate motivational profiles.

Results: We unraveled four motivational profiles: (1) good quality with high AM/low CM, (2) high quantity with high AM/high CM, (3) poor quality with low AM/high CM, and (4) low quantity with low AM/low CM. Female pharmacists, pharmacists working in a hospital pharmacy, pharmacists working for more than 10 years, and pharmacists not in training were highly represented in the good-quality profile. Pharmacists working in a community pharmacy, pharmacists working for less than 10 years, and pharmacists in training were highly represented in the high-quantity profile. Male pharmacists were more or less equally distributed over the four profiles. The highest percentage of pharmacy owners was shown in the low-quantity profile, and the highest percentage of the nonowners was shown in the good-quality profile.

Discussion: Pharmacists exhibit different motivational profiles, which are associated with their background characteristics, such as gender, ownership of business, practice setting, and current training. Motivational profiles could be used to tailor CE courses for pharmacists.

Keywords: profession-pharmacist, performance improvement continuing education, strategic issues in continuing medical education/continuing professional development, academic motivation scale, self-determination theory, motivation, lifelong learning, continuous education

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The current changes in patient care demand modification in health care services.[1–3] To meet this demand, all health care professionals face the challenge of lifelong development and maintenance of their knowledge and competencies. Among pharmacists in practice, lack of motivation is one of the important barriers for participation in continuing education (CE) and continuing professional development (CPD).[4,5] Some studies have shown that among pharmacists, intrinsic motivation (personal desire and enjoyment) in general is one of the facilitators for learning.[6,7] However, to our knowledge, little is known about the quality and quantity of motivation of pharmacists for CE/CPD.

Several studies of motivation within medical education have used *self-determination theory* (SDT), which addresses the relationship and importance of both quality and quantity of motivation.[8–10] This theory has been applied to many different contexts, such as parenting, sports and exercise, and also to educational settings (both academic and developmental domains).[11]

In SDT,[11,12] types of motivation are arrayed along a continuum and include amotivation, extrinsic motivation, and intrinsic motivation (FIG. 1). Amotivation is the state of passive behavior, in which people are unable to accomplish required outcomes. Intrinsic motivation is the most autonomous form of motivation and is driven by interest and joy in the task itself and exists within the individual. Extrinsic motivation originates from outside the individual (ie, from external factors) and is additionally characterized by four qualities of regulation:

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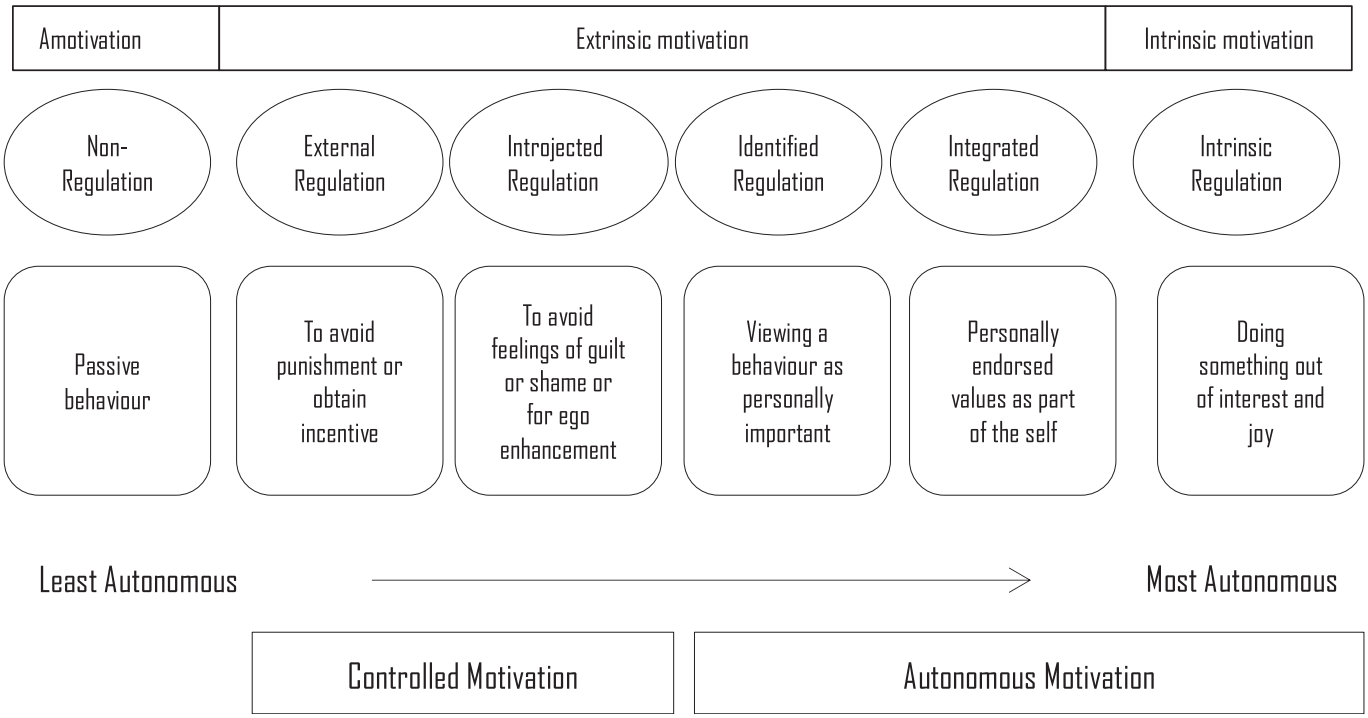

FIGURE 1. The self-determination continuum adapted from Ryan and Deci[11] and Van den Broeck et al.[12]

external regulation (not accepting a rule as valid but doing something to avoid punishment or obtain an incentive), *introjected regulation* (to avoid feelings of guilt and shame and for ego enhancement), *identified regulation* (viewing a behavior as personally important), and *integrated regulation* (behavior from personally endorsed values as part of the self). External regulation is the lowest and integrated regulation is the highest in its degree of autonomy. External regulation and introjected regulation can be combined into a single variable labeled controlled motivation (CM). Identified and integrated regulation and intrinsic motivation can be combined to represent autonomous motivation (AM). CM is considered low quality and AM is considered high quality.

Motivation is a dynamic entity and AM can change into CM and vice versa depending on the degree to which basic psychological needs are being met.[11] High need satisfaction is associated with AM; low need satisfaction engenders CM. In SDT, motivation is influenced by three basic psychological needs: a need for self-determination/autonomy (eg, feeling of choice), a need for competence (eg, meeting preset standards), and a need for relatedness (eg, recognizing role models and peers). This means that the quality of motivation for education depends on an educational environment (eg, autonomy supportive teachers), which fosters or hampers meeting these needs.[11]

There is evidence from medical education that the best quality motivation—AM—is positively associated with better learning, better academic performance, and most importantly better patient care.[13,14] Besides the quality of motivation (the balance of AM versus CM in each individual), the quantity of AM and CM and their combination also play an important role in educational outcomes. Previous studies have used motivational profiles based on the different combinations of AM and CM have shown they are associated with important educational outcomes (eg, increased persistence, optimal learning patterns, and better academic adjustment).[15–17] This approach is termed "person oriented" and focuses on individuals with similar characteristics rather than on research variables. The different profiles and their association with educational outcomes found in these studies are shown in TABLE 1.[15–17]

All three studies show the importance of *quality* of motivation (relative high AM versus low CM) over the *quantity* of motivation (high scores on AM, CM, or on both) in relation to better educational outcomes. These studies were conducted among high school, college, and medical students, but not for pharmacists. In this study, we applied the personalized profile approach to pharmacists, because the combination of AM and CM could give us a more holistic picture of the quality and quantity of pharmacists' motivation for CE. Exploring what profiles apply to pharmacists and how these profiles might vary in relation to certain demographic characteristics might be of value for CE providers and legislative parties. This information can be helpful in providing targeted and effective CE courses for pharmacists to improve patient care.

The research questions for this study were as follows: (1) Can we identify motivational profiles, based on quality and quantity of motivation, for pharmacists participating in CE? (2) If so, how are these profiles associated with demographic and occupational characteristics of pharmacists?

Our study will contribute to the literature by validating SDT in a target group that has not been studied before and where motivation could be a key factor in the success of their education and practice. Based on the earlier findings, we hypothesize that there are three or four different motivational profiles in pharmacists for CE.

TABLE 1.

Motivational Profiles Found by Earlier Studies[15–17] in Relation to Their Educational Outcomes

Study Reference	Research Population	Variables Used	Motivational Profiles Revealed	Educational Outcomes
Kusurkar et al.[15]	Year 1–6 medical students	IM CM	HIHC LILC LIHC HILC	HIHC: desirable learning profile, high surface strategy LILC and LIHC: least desirable learning behavior HILC: good study hours, deep study strategy, good academic performance, and less exhaustion
Vansteenkiste et al.[16]	Study 1: secondary school (high school) students Study 2: college students	AM CM	Study 1 and 2: Good quality: high AM, low CM High quantity: high AM, high CM Poor quality: low AM, high CM Low quantity: low AM, low CM	Good quality: most optimal learning pattern, highest score on perceived need-supportive teaching High quantity: not better in academic functioning, higher levels on test anxiety Poor quality: no improved learning versus low quantity, higher on procrastination and test anxiety, lower on effort regulation versus low quantity *General conclusion: findings favored qualitative perspective compared with the other groups*
Ratelle et al.[17]	Study 1 and 2: high school students Study 3: college students	AM CM Amotivation	Study 1 and 2: Group 1: low AM, high CM, high amotivation Group 2: high AM, high CM, low amotivation Group 3: moderate AM, moderate CM, low amotivation Study 3 Group 1: high AM, low CM, low amotivation Group 2: high AM, high CM, low amotivation Group 3: low–moderate various motivational components	Students in group 2 reported highest degree of academic adjustment and had higher grades and lower absenteeism versus group 1 Group 2 and group 3 did not differ significantly on these measures Group 1 and group 2 had similar achievement levels, but students in autonomous group were more persistent in their study Group 1 and 2 had better academic performance than group 3 Being in group 3 was the most effective predictor of dropout

AM indicates autonomous motivation; CM, controlled motivation; HIHC, high intrinsic–high controlled; HILC, high intrinsic–low controlled; IM, instrinsic motivation; LIHC, low intrinsic–high controlled; LILC, low intrinsic–low controlled.

METHOD

Educational Context

Pharmacy practice in the Netherlands is regulated by the Royal Dutch Pharmaceutical Society (KNMP). Pharmacy graduates can be further educated to become community pharmacists or hospital pharmacists after training of 2 or 4 years, respectively. To maintain licensure, pharmacists must collect 200 accreditation hours every 5 years, by following CE. From January 2015, the KNMP deployed new rules,[18] which require that a part (10 hours) of the accreditation hours be invested in self-reflection like peer-review learning. The remaining 190 hours must be devoted to developing and maintaining four of seven core competencies derived from the CanMEDS model.[19] The new system demands a targeted approach to lifelong learning and stimulates the participation in specific CE courses to fill the personal knowledge and skills gaps of the pharmacists. For pharmacists, in the Netherlands, these new regulations represent a transition from a traditional continuous education system (in which pharmacists participate in stand-alone accredited CE courses without follow-up) to a CPD system that entails participating in CE courses (acting), managing knowledge and skills (evaluating), monitoring personal gaps (reflecting), and deciding how to fill those gaps (planning).[20]

Because this CPD system requires that pharmacists be more self-directed, and motivation influences all stages of self-directed learning,[21] this study can provide insight into how best to deal with the challenges arising from this transition.

Pharmacy Practice in the Netherlands

In the Netherlands, community pharmacies can be owned privately by pharmacists, but there is a trend toward companies owning or franchising community pharmacies. In 2014, there were 1979 community pharmacies: 456 privately owned, 889 franchise, and 634 chain pharmacies.[22]

In addition, there are 118 hospital pharmacies and 79 outpatient pharmacies situated in Dutch hospitals.[23] Registration as a community pharmacist is sufficient to work in an outpatient pharmacy.

Study Participants

From September to December of 2013, 831 pharmacists were invited to complete a questionnaire during CE courses provided by the Netherlands Centre for Post-Academic Education in Pharmacy. Researchers provided oral and written information about the study. The participants signed informed consent forms with permission to be approached for future research.

Instrument Used

A standardized and validated questionnaire called the Academic Motivation Scale (AMS)[24] was used to measure the quantity and quality of pharmacists' motivation for CE. Given that the AMS is based on SDT and has demonstrated high reliability (Cronbach alpha from 0.77 to 0.90),[25] we determined that it was the most suitable instrument for our target group and the study purpose.

TABLE 2.

Mean Scores of Pharmacists on Autonomous Motivation (AM), Controlled Motivation (CM), and Amotivation

Characteristic	No. Respondents, *n* (%)	Mean AM (SD)	Mean CM (SD)	Mean Amotivation (SD)
Gender (*n* = 392)				
Females	245 (62.5)	3.41 (0.54)	2.07 (0.72)	1.43 (0.58)
Males	147 (37.5)	3.19 (0.54)	2.00 (0.78)	1.55 (0.71)
		P < .001	n.s.	n.s.
Current practice setting (*n* = 413)				
Community pharmacy	220 (53.3)	3.31 (0.57)	2.22 (0.79)	1.60 (0.68)
Hospital pharmacy	193 (46.7)	3.36 (0.54)	1.83 (0.63)	1.34 (0.52)
		n.s.	*P* < .001	*P* < .001
Ownership status (*n* = 399)				
Owner	44 (11.0)	2.87 (0.65)	1.68 (0.60)	1.57 (0.84)
Nonowner	355 (89.0)	3.39 (0.52)	2.10 (0.75)	1.46 (0.59)
		P < .001	*P* < .001	n.s.
Work experience (*n* = 420)				
<10 y	260 (61.2)	3.44 (0.50)	2.24 (0.75)	1.55 (0.62)
>10 y	160 (37.6)	3.13 (0.60)	1.73 (0.63)	1.36 (0.66)
		P < .001	*P* < .001	*P* = .004
In training (*n* = 403)				
Yes	118 (29.2)	3.47 (0.50)	2.23 (0.69)	1.57 (0.64)
No	285 (70.7)	3.26 (0.58)	1.95 (0.75)	1.43 (0.63)
		P = .010	*P* < .001	*P* = .038

Mean scores are based on the AMS with a 5-point Likert scale, on which 1 represented strongly disagree and 5 represented strongly agree.

For this study, the questionnaire was translated in Dutch and back-translated in English to ensure correct translation. The Dutch version was piloted by pharmacists and educators. Adaptation of the questionnaire was inspired by published guidelines.[26]

The AMS consists of 28 questions designed to assess the various theoretical dimensions of motivation as described in SDT. An example of an item assessing identified regulation is "Because I think continuing education will help me prepare for my chosen career" and one assessing intrinsic motivation is "Because I enjoy discovering things I didn't know before." Responses were recorded on a 5-point Likert scale, on which one represented "strongly disagree" and five represented "strongly agree." Background information including sex, age, work experience, practice setting, and current training status was also collected. AM scores were calculated by averaging the scores of intrinsic motivation and identified regulation. CM scores were calculated by averaging the introjected regulation and external regulation scores. Amotivation was already a separate subscale in this questionnaire.

Ethical Approval

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

Statistical Analyses

The statistical analyses were performed using SPSS version 20. A Cronbach alpha was determined for all subscales. Pharmacists were grouped into different motivational profiles using K-means cluster analysis (squared Euclidean distances and iterative method) using the Z-scores of their AM and CM. Explained variances in AM, CM, and amotivation scores were calculated using analysis of variance. Cross-validation of the clusters was performed with different subsets.

To determine whether missing values were randomly distributed, Little's Missing Completely At Random test was used. The missing data (less than 1.1%) were managed in SPSS using expectation maximization.

RESULTS

Four hundred thirty-two of 831 pharmacists (response rate of 57.5%) responded to our questionnaire. Not all scales were completed by all pharmacists. TABLE 2 shows the demographics of the respondents and their corresponding mean scores on types of motivation. The scores of 425 pharmacists were included for further analysis. The internal consistency of the subscales was acceptable (Cronbach alpha varied from 0.66 to 0.87).

Women scored significantly higher on AM than men. Pharmacy owners scored significantly lower on both AM and CM than nonowners. Pharmacists working in a community pharmacy had higher scores on both CM and amotivation than pharmacists working in a hospital pharmacy. Pharmacists working for less than 10 years scored significantly higher on all types of motivation than pharmacists working for more than 10 years. Pharmacists in training had significantly higher scores on all types of motivation in comparison with pharmacists not in training.

The next step was the cluster analysis. The mean score of the participants was low (1.47) on amotivation, so we decided to use the clustering method of Vansteenkiste et al.[16] and Kusurkar et al.,[15] in which amotivation was excluded from the analysis. After trying to fit a 2-cluster, 3-cluster, and 4-cluster solutions, we found the 4-cluster solution to fit the data best. This explained 70.2% variance in the AM scores and 73.2% in the CM scores.

FIGURE 2 presents the final cluster solution based on Z-scores of AM and CM. Like Vansteenkiste et al,[16] we categorized our clusters into (1) a good-quality (GQL) motivation profile (*n* = 135, 31.8%) with relatively high scores on AM and low scores on CM, (2) a high-quantity (HQT) motivation

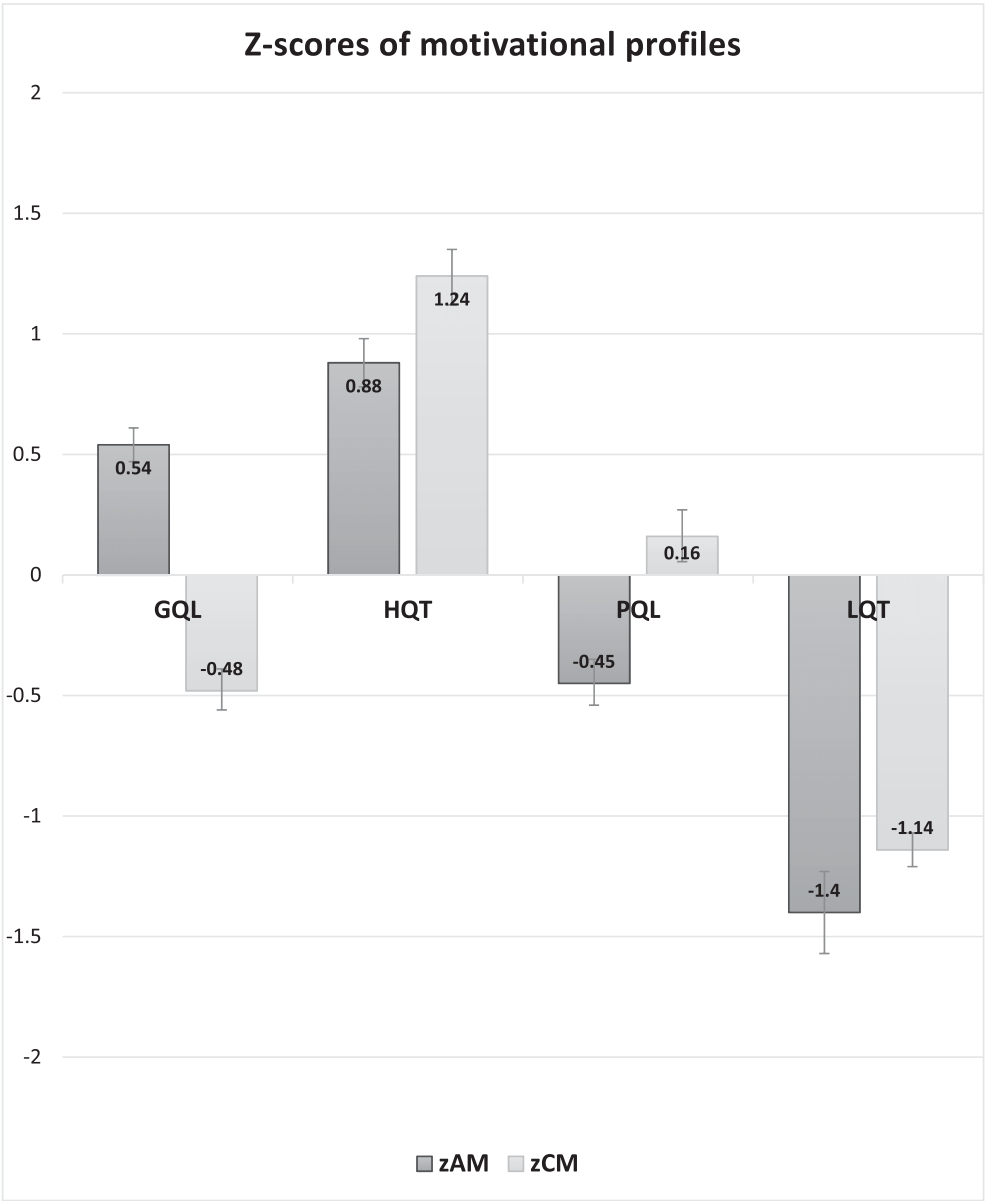

FIGURE 2. Motivational profiles using Z-scores of variables autonomous motivation (AM) and controlled motivation (CM) with 95% confidence limits. GQL indicates good quality; HQT, high quantity; LQT, low quantity; PQL, poor quality

profile (n = 114, 26.8%) with high scores on both AM and CM, (3) a poor-quality (PQL) motivation profile (n = 97, 22.8%) with relatively low scores on AM and high scores on CM, and (4) a low-quantity (LQT) motivation profile (n = 79, 18.6%) with low scores on both AM and CM. TABLE 3 shows the mean scores on AM, CM, and amotivation of the different profiles.

TABLE 4 shows the characteristics of the motivational profiles found in pharmacists. FIGURE 3 exhibits the contrasts and resemblances among the profiles when comparing the different demographic and occupational characteristics.

Females were highly represented in the GQL profile (35.5%). Males were similarly distributed among the four profiles. Pharmacists working in a community pharmacy were the most represented in the HQT profile (34.5%), whereas pharmacists working in a hospital pharmacy were the most represented in the GQL profile (42.5%). There were also distinctive differences between pharmacy owners and nonowners. The highest percentage of owners was shown in the LQT profile (36.4%) and the highest percentage of nonowners was shown in the GQL (31.8%) and the HQT profile (30.1%). Both pharmacists working for less than 10 years (36.1%) and pharmacists in training (37.3%) were highly represented in the HQT profile, whereas pharmacists working for more than 10 years (34.4%) and pharmacists not in training (33.0%) were both highly represented in the GQL profile.

DISCUSSION

To our knowledge, this is the first study reporting the quality and quantity of pharmacists' motivation for CE. We found females to

TABLE 3.

Mean Scores on Autonomous Motivation (AM) and Controlled Motivation (CM) of the Different Profiles

	GQL, *n* = 135, Mean (SD)	HQT, *n* = 114, Mean (SD)	PQL, *n* = 97, Mean (SD)	LQT, *n* = 79, Mean (SD)	*F*	% of Variance Explained
AM	3.60_a (0.24)	3.79_b (0.31)	3.05_c (0.26)	2.52_d (0.43)	334.058*	70.2
CM	1.68_a (0.40)	2.97_b (0.46)	2.16_c (0.40)	1.19_d (0.24)	387.917*	73.2
Amotivation	1.23_a (0.44)	$1.47_{a,c}$ (0.50)	1.83_b (0.80)	1.44_c (0.70)	18.749*	

The mean scores and SD of AM, CM, and amotivation for the four pharmacists' profiles: good quality (GQL), high quantity (HQT), poor quality (PQL), and low quantity (LQT). The mean values with the different subscripts (a, b, c, and d) differ significantly from each other.

*$P < .001$.

be most represented in the GQL profile. This is in alignment with the findings of Kusurkar et al.[15] and Vansteenkiste et al.[16] General motivation literature[27] suggests that females are more intrinsically motivated than males regarding learning, and confirms our findings of a higher score on AM of females and them being the most represented in our GQL profile.

We also found that the profiles differed not only on their sex distribution but also on other variables such as the practice setting, ownership of business, work experience, and current status of training. Pharmacists working in a hospital pharmacy were represented the most in the GQL profile. This corresponds with the significant higher scores of this group on AM, compared with pharmacists working in a community pharmacy. The explanation could be that they work in an environment that stimulates and challenges their knowledge and competencies in a different (eg, autonomous) way. Because more than 80% of pharmacists working in a hospital pharmacy consisted of registered hospital pharmacists and hospital pharmacists in training, another explanation could be that the training program to become a hospital pharmacist is longer and more demanding than the training to be a community pharmacist. The possibility exists that pharmacists who choose to work in a hospital or to specialize in hospital pharmacy are already more intrinsically motivated.

Although the group of pharmacy owners was relatively small ($n = 44$), it is remarkable that this group was the most represented in the LQT profile compared with the nonowners group, which was the most represented in the GQL profile. Based on the findings of Dobson and Perepelkin,[28] who demonstrated the similarity of professional autonomy (being able to determine and set standards for professional practice) for pharmacy owners and managers and higher manager autonomy (ie, decision-making and amount of control) for pharmacy owners compared to managers, we did not expect to find low motivation in this group. A possible explanation for this finding could also be the small size of this group.

The distinctive differences we found between pharmacists working for less than 10 years in comparison with pharmacists working for more than 10 years could be partly due to the same reasons as those for finding differences between pharmacists in training compared with pharmacists not in training. Pharmacists in training are often the same group as pharmacists working for less than 10 years. These groups were both most represented in the HQT profile. It could be that pharmacists in training have more CM, because they are in a program that has mandatory training. Also, they (like pharmacists working for less than 10 years) are busy trying to find the balance between work and family obligations, so the participation in CE is not their first (volitional) choice. Age can be an important aspect, and it has been demonstrated by Völkening et al.[29] that AM increases significantly with age. It is promising to see that most pharmacists not in training and pharmacists working for more than 10 years were found in the GQL profile. This implies a possible shift from HQT (a more controlled profile) to GQL (a more autonomous profile) of pharmacists' motivation for CE;

TABLE 4.

Characteristics of the Four Pharmacist's Profiles

	GQL, *n* (%)	HQT, *n* (%)	PQL, *n* (%)	LQT, *n* (%)	Chi-Square
Gender ($n = 392$)					
Female	87 (35.5)	72 (29.4)	53 (21.6)	33 (13.5)	
Male	40 (27.2)	31 (21.1)	39 (26.5)	37 (25.2)	12.3 (df = 3.388), $P = .006$
Current practice setting ($n = 413$)					
Community pharmacy	50 (22.7)	76 (34.5)	56 (25.5)	38 (17.3)	
Hospital pharmacy	82 (42.5)	36 (18.7)	38 (19.7)	37 (19.2)	23.8 (df = 3.409), $P < .001$
Owner ($n = 399$)					
Yes	12 (27.3)	3 (6.8)	13 (29.5)	16 (36.4)	
No	113 (31.8)	107 (30.1)	79 (22.3)	56 (15.8)	18.1 (df = 3.395), $P < .001$
Working experience ($n = 420$)					
<10 y	76 (29.2)	94 (36.1)	59 (22.7)	31 (11.9)	
>10 y	55 (34.4)	19 (11.9)	38 (23.8)	48 (30.0)	39.8 (df = 3.388), $P < .001$
In training ($n = 403$)					
Yes	37 (31.4)	44 (37.3)	26 (22.0)	11 (9.3)	
No	94 (33.0)	59 (20.7)	66 (23.2)	66 (23.2)	17.5 (df = 3.399), $P = .001$

GQL indicates good quality; HQT, high quantity; LQT, low quantity; PQL, poor quality.

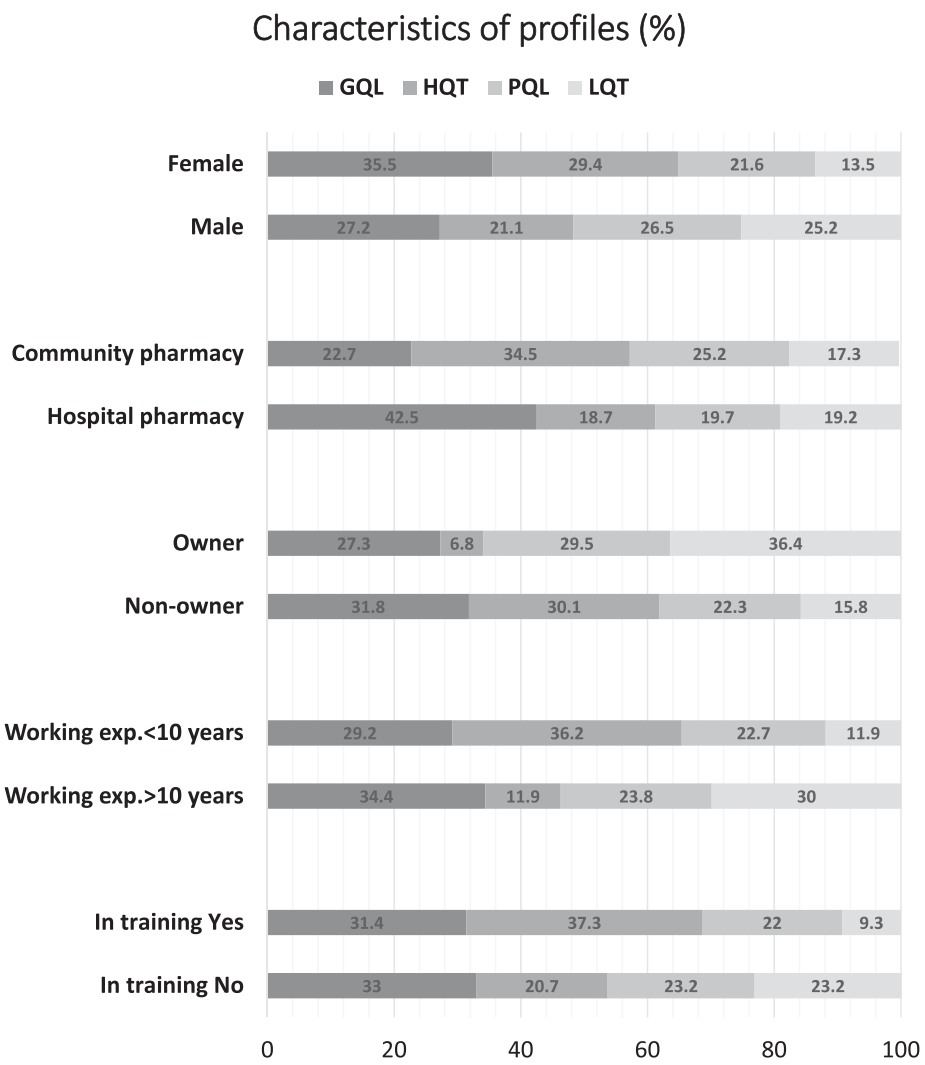

FIGURE 3. Characteristics of the motivational profiles: good quality (GQL), high quantity (HQT), poor quality (PQL), and low quantity (LQT). % male versus % female, % pharmacist working in a community pharmacy versus % pharmacist working in a hospital pharmacy, % owners versus % nonowners, % pharmacists working for less than 10 years versus % pharmacists working for more than 10 years, and % pharmacists in training versus % pharmacists not in training per profile

when their training is complete, pharmacists get older or have more work experience.

Based on the findings of Ratelle et al.,[17] Moran et al.,[30] Kusurkar et al.,[15] and Vansteenkiste et al.,[16] which state the importance of quality above quantity, we think our findings can indicate that a large group (almost 70%) of our respondents can be at risk for developing controlled behavior. Although the GQL profile consists of the largest group of pharmacists, almost 70% of our participants were represented in the HQT, PQL, and LQT profiles. Even though good learning outcomes are expected from the HQT profile, this group with a significantly higher CM score than the CM score of the PQL profile seems as much at risk as the PQL profile. Because pharmacists in training are highly represented in both HQT and PQL profiles, the learning outcomes of this group warrant further study. Depending on these outcomes, the learning environment could be adapted to stimulate AM of this group.

We found both AM and CM in pharmacists for CE, in contrast with Tassone and Heck,[31] who found gaining knowledge rather than external pressures to be the main motivational orientation in allied health care professionals. Therefore, we cannot support the objection of Tassone and Heck to an obligatory CE system for health care professionals.

Implications for Practice and Further Research

Pharmacists have been profiled earlier according to their motivation.[8,32] Moreover, pharmacists have reported preferences for interactive and multidisciplinary CE.[33] These studies have suggested different educational formats for developing CE instead of the one-size-fits-all approach of the traditional lifelong learning system. The finding of four types of motivational profiles among pharmacists advocates a whole new CE approach. It could give CE-providers guidance in the type of learning formats and environment required to stimulate and foster the AM of the pharmacists for CE.

Our findings demonstrate the existence of CM in pharmacists. Based on these results, we think that, in contrast with the suggestion of Tassone and Heck,[31] obligatory CE might be required to preserve the minimum requirements of knowledge and competencies of pharmacists, necessary for a better patient care.

Despite that there is no evidence yet that tailored educational formats could cater to all types of motivation, we can imagine that fulfilling the basic psychological needs derived from SDT,[11] such as autonomy (eg, feeling of choice) and perceived competence (eg, feeling of mastering certain knowledge and skills), could lead to educational approaches that stimulate and foster *GQL* motivation. For example, a menu "á la carte" with customized courses per profile could be offered. Another approach could be a "three-course meal," where the starter course provides the "must-know" knowledge, the main course provides the "good-to-know" knowledge, and the dessert the "nice-to-know" knowledge. With this approach, pharmacists can decide autonomously to progress to more challenging assignments to fulfill their individual motivational needs. CE providers should rethink about their CE model beginning with the education of their instructors on how to design their courses to be autonomy supportive.[34] Subsequently, an educational model can be designed that offers different choices of learning formats, eg, e-learning, workshops, games. This model will enable pharmacists to follow customized educational pathways, based on their need at a particular moment, at their own pace and in a manner of learning which is effective for them.

Future research questions raised are as follows: (1) Do motivational profiles of pharmacists in CE change over time? (2) If yes, what type of CE courses can cause these changes? Furthermore, we would like to study the learning outcomes of pharmacists in training. This group is represented for 60% in the HQT and PQL profile and scores significantly higher on CM compared with the GQL profile. In our opinion, priority should be given to this group, which is the future of our health care but is likely to develop test anxiety, exhaustion (burn out), and dropout.[15,17]

LIMITATIONS

The AMS questionnaire has been validated in high school and college students and has rarely been used with health care professionals.[24,25] More experience with this and other scales is necessary to demonstrate the validity of this instrument in practicing health professionals.

With the cluster analysis, the variable, amotivation, was disregarded. Further research in adult motivation for learning should be performed to estimate the value of this variable in generating motivational profiles.

Although the sample size was big enough to generate enough evidence for our findings, positive bias cannot be ruled out because we collected the data from pharmacists who already participated in CE. Research in pharmacists' motivation for CE needs to be duplicated in other contexts and with pharmacists, who do not participate in CE, to confirm our findings.

Compared with earlier studies, the PQL profile had a relatively low Z-score and the HQT profile had a relatively high Z-score on CM.[16,17] This suggests that these profiles may be less distinctive than we think.

CONCLUSION

Four motivational profiles were discovered in pharmacists on the basis of the combination of AM and CM. The distribution of pharmacists over these profiles differed by sex, practice setting, ownership of practice, and being in training.

Lessons for Practice

- Four motivational profiles were found in pharmacists for CE.
- The motivational profiles are associated with pharmacists' background characteristics, such as gender, ownership of business, practice setting, and current training.
- A new CE approach where CE providers take the different motivational profiles in consideration when developing their courses could be valuable.

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