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Motivational Profiles and Motivation for Lifelong Learning of Medical Specialists

Stéphanie M. E. van der Burgt, MSc; Rashmi A. Kusurkar, MD, PhD; Janneke A. Wilschut, PhD; Sharon L. N. M. Tjin A Tsoi, PharmD, PhD; Gerda Croiset, MD, PhD; Saskia M. Peerdeman, MD, PhD

Introduction: Medical specialists face the challenge of maintaining their knowledge and skills and continuing professional development, that is, lifelong learning. Motivation may play an integral role in many of the challenges facing the physician workforce today including maintenance of a high performance. The aim of this study was to determine whether medical specialists show different motivational profiles and if these profiles predict differences in motivation for lifelong learning.

Methods: An online questionnaire was sent to every medical specialist working in five hospitals in the Netherlands. The questionnaire included the validated Multidimensional Work Motivation Scale and the Jefferson Scale of Physician Lifelong Learning together with background questions like age, gender, and type of hospital. Respondents were grouped into different motivational profiles by using a two-step clustering approach.

Results: Four motivational profiles were identified: (1) HAMC profile (for High Autonomous and Moderate Controlled motivation), (2) MAMC profile (for Moderate Autonomous and Moderate Controlled motivation), (3) MALC profile (for Moderate Autonomous and Low Controlled motivation), and (4) HALC profile (for High Autonomous and Low Controlled motivation). Most of the female specialists that work in an academic hospital and specialists with a surgical specialty were represented in the HALC profile.

Discussion: Four motivational profiles were found among medical specialists, differing in gender, experience and type of specialization. The profiles are based on the combination of autonomous motivation (AM) and controlled motivation (CM) in the specialists. The profiles that have a high score on autonomous motivation have a positive association with lifelong learning.

Keywords: motivational profiles, medical specialists, motivation, continuing professional development, lifelong learning

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The introduction of sophisticated technological developments and the new rules and regulations in health care are continuously changing. The demand for care is increasing and, simultaneously, the costs need to decline.[1] This increases the pressure on medical specialists, especially to maintain their knowledge and skills and continuing professional development (CPD), that is, lifelong learning.[2,3] Research has shown that stressors together with health reforms can increase job stress and reduce health workers' motivation and performance regarding patient care and patient safety.[4,5] When medical specialists do not keep up with their changing context, it impacts the quality of health care and patient safety.[6] According to the latest research into preventable adverse events in hospitals in the Netherlands, the weak points that need focus and improvement are knowledge and skills about technological developments and the resilience of the professionals.[6]

Although learning and development opportunities are experienced as energy sources by practicing health professionals, a lack of motivation (20.2%), a lack of time (84.1%), and a lack of funding (50.4%) are the most important barriers for participation in continuing education (CE) and CPD.[7] However, to our knowledge, little is known about the work

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Availability of data and materials: The dataset generated and analyzed during the current study is available from the corresponding author on request.

***Ms. van der Burgt**: Department of Research in Education, VUmc School of Medical Sciences, Amsterdam, the Netherlands, and LEARN! Research Institute for Learning and Education, Faculty of Psychology and Education, VU University Amsterdam, the Netherlands. **Dr. Kusurkar:** Department of Research in Education, VUmc School of Medical Sciences, Amsterdam, the Netherlands, and LEARN! Research Institute for Learning and Education, Faculty of Psychology and Education, VU University Amsterdam, the Netherlands. **Dr. Wilschut:** Department of Epidemiology & Biostatistics, VU University Medical Center, Amsterdam, the Netherlands. **Dr. Tjin A Tsoi:** Department of Research in Education, VUmc School of Medical Sciences, Amsterdam, the Netherlands, and Department of Epidemiology & Biostatistics, VU University Medical Center, Amsterdam, the Netherlands. **Dr. Croiset:** Department of Research in Education, VUmc School of Medical Sciences, Amsterdam, the Netherlands, LEARN! Research Institute for Learning and Education, Faculty of Psychology and Education, VU University Amsterdam, the Netherlands, and PAOFarmacie, the Netherlands Centre for Post-Academic Education in Pharmacy, Bilthoven, the Netherlands. **Dr. Peerdeman:** Department of Research in Education, VUmc School of Medical Sciences, Amsterdam, the Netherlands, and Department of Neurosurgery, VU University Medical Center, Amsterdam, the Netherlands.*

***Correspondence:** Stéphanie M. E. van der Burgt, MSc, VUmc School of Medical Sciences, PK KTC 5.002, P.O. Box 7057, 1007 MB Amsterdam, The Netherlands; e-mail: s.vanderburgt1@vumc.nl.*

motivation of medical specialists in general and their motivation for CE/CPD in particular.

Motivation at work concerns the underlying reasons driving people to perform their work activities.[8] Motivation for work has been associated with greater job satisfaction, commitment, well-being, and less job turnover intentions.[9–12] Autonomous motivation (AM) facilitates and stimulates deep level learning (learning for understanding and application) and academic success and leads to positive well-being and greater resilience among health professionals such as pharmacists.[13–16]

Theoretical Background

Self-determination theory (SDT) classifies qualitatively different types of motivation on a dynamic continuum and shows several different states of this quality, namely: amotivation, external, introjected, identified, and integrated regulation and intrinsic motivation.[17] Of these, external and introjected regulation together form controlled motivation (CM). Identified and integrated regulation and intrinsic motivation together form AM. AM is considered good quality motivation and CM is considered poor quality motivation.[18–20] Within SDT, three basic psychological needs are distinguished: autonomy (experiencing behavior as self-chosen and self-endorsed), perceived competence (experiencing behavior as masterful), and relatedness (feeling mutually connected with peers and important others).[17,21] Need satisfaction is theorized to promote psychological growth and healthy functioning and AM, whereas need frustration or thwarting is theorized to contribute to energy depletion, dysfunction, illness, and CM (Fig. 1).[10,12,19]

Research in medical education shows that AM is positively associated with better learning, better academic performance, positive well-being, greater resilience, and better patient care.[4,5,13–16,22] On the contrary, CM is associated with the least desirable outcomes, like negative well-being and poor resilience, procrastination, and surface-level learning.[4,5,13–16,22] 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 (eg, increased persistence, optimal learning patterns, and better academic adjustment).[20,21] This means that work contexts that are perceived as supportive of basic psychological needs are conductive to optimal motivation, functioning, and well-being among employees, along with benefits for the organization.[23] However, next to lack of motivation being mentioned as a barrier for participating in CPD, it seems that the need for autonomy and competence among medical specialists is being thwarted.[24]

So to ensure that the work context is supportive of the optimal motivation of medical specialists, we need to know what kind of motivation medical specialists have. Motivational profiles (different combinations of AM and CM) have been investigated in studies among high school, college and medical students, and pharmacists.[20,21,25,26] All these studies show that the quality of motivation is more important than quantity, especially in relation to better learning outcomes, positive well-being, and patient care outcomes.[20,21,25,26]

In this study, we group medical specialists with similar combinations of AM and CM to create motivational profiles. Unraveling the motivational profiles of medical specialists and investigating whether these profiles vary with demographic characteristics and predict differences in lifelong learning, motivation might be of value for hospital boards, legislative parties, and carrying out interventions. Our study will also contribute to the literature as SDT has not been validated in this particular target group before.

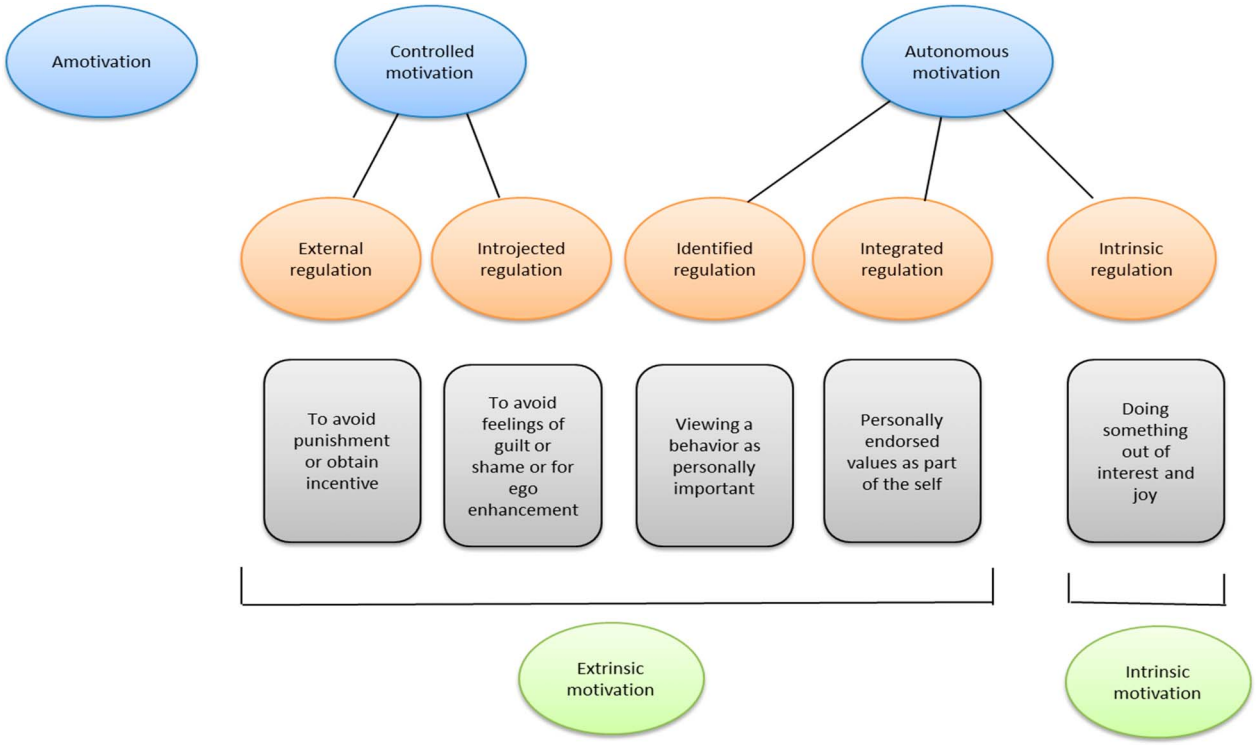

FIGURE 1. Motivational continuum adapted from Deci and Ryan (2002)

The research questions for this study were as follows: (1) Which motivational profiles relating to combinations of autonomous and controlled work motivation are seen among medical specialists? (2) Do these motivational profiles vary with demographic characteristics and type of specialty? (3) Are motivational profiles associated with differences in lifelong learning motivation?

METHOD

Setting and Sample

A quantitative study was conducted within five hospitals in the Netherlands. An academic hospital (VU University Medical Center, Amsterdam), two large merged teaching hospitals (NWZ groep Alkmaar, Spaarnegasthuis, Haarlem), and two affiliated teaching hospitals (Westfriesgasthuis Hoorn and Rode Kruis Ziekenhuis Beverwijk) were included in this study. An online questionnaire was sent to every medical specialist working in these hospitals. Before respondents could fill in the questionnaire, they had to give their written informed consent. In our setting, a medical specialist is a physician (MD) with a completed, postgraduate specialty training.

Measures

Work motivation: The standardized and validated 19-item Multidimensional Work Motivation Scale[27] measures the motivation of a medical specialist for practice. The stem is "Why do you or would you put efforts into your current job?" with items like; "Because I personally consider it important to put efforts in this job." Responses are made on the following scale: 1 = "not at all" to 7 = "completely." This scale has six subscales that assess the following states of motivation: amotivation, external regulation-social, external regulation-material, and introjected regulation which together measure CM, and identified regulation and intrinsic motivation, which together measure AM. In addition, external regulation has items focusing on material, for example, money as well as social rewards, for example, praise.

Motivation for lifelong learning: The 14-item revised Jefferson Scale of Physician Lifelong Learning[28] was used to measure the motivation for lifelong learning of medical specialists. The stem is "Please indicate the extent of your agreement with each of the following statements by circling the appropriate number" with items like: "I believe that I would fall behind if I stopped learning about new developments in my profession." Responses were made on the following scale: 1 = "strongly disagree" to 4 = "strongly agree." Higher scores indicate more orientation toward lifelong learning.

Both scales were translated from English to Dutch by two researchers and then from Dutch to English by two other researchers.[29] Both English translations were checked to be the same and small differences of opinion were resolved by consensus so that nothing from the original questionnaire got lost in translation.[29] The final questionnaire also included background questions, like gender, age, type of hospital, specialty, and the number of years of experience as a medical specialist.

Analysis

Data from the questionnaire were analyzed using SPSS version 22.0. The validity and reliability of the questionnaires used were determined using confirmatory factor analysis. In addition, Cronbach's alpha value for each subscale used was calculated. Subsequently, medical specialists were grouped into different motivational profiles using a two-step clustering approach. The first step was applied to fix the number of clusters based on Ward's method. For the cluster solution to be acceptable, it needed to explain a minimum of 50% variance of the autonomous and CM scores.[25,26] In the second step, a k-means cluster analysis was performed (using the squared Euclidian distances and iterative method). The findings from the first step were used as initial clustering in the second step. For the cluster analysis, the Z-scores of total scores on AM and CM were used. Using the analysis of variance, the variances of the amotivation, CM, and AM scores explained by the cluster solution were calculated. The clusters were cross-validated with different subsets.

Ethical Approval

The Medical Ethics Review Committee of VU University Medical Center Amsterdam, the Netherlands, granted exemption from ethical approval for this study. To ensure compliance with the rules established by the declaration of Helsinki, participants were told that their participation in the study was voluntary, there was a guarantee of confidentiality and anonymity, and nonparticipation would not cause them any harm.

RESULTS

One hundred and ninety-three out of 1591 (12.2%) medical specialists filled out the questionnaire. It has been known that medical specialists have an overwhelming amount of questionnaires sent to them, and they already experience too little time to do their daily job. So, it is possible that it takes motivated specialists to participate in questionnaires. If so, then it might be that the level of motivation can be overestimated in this study. Considering the context, the response rate is reasonable for this population and above the minimum number of 180 according to the power analysis. The a priori power analysis was conducted two tailed with a medium effect size of 0.3, an alpha error probability of 0.05, and a power of 0.95. Table 1 shows the broad range of specialties that are represented in this study. Pediatricians (10.3%), surgeons (9.7%), and anesthesiologists (8.2%) are the specialties with the highest percentages. Table 1 also shows the division of the specialties into three groups; surgical, nonsurgical, and supportive. For further analysis, we have used these three groups, which are based on the division that is used by NIVEL which is the national institute for health research in the Netherlands.[30] NIVEL uses a division of six groups: first-line curative care (ie, general practitioner), public health care (ie, occupational physician), psychiatry (except psychiatrist working at a hospital), surgical (all specialties that work in the operating theatre), nonsurgical (ie, dermatologist, cardiologist), and supportive (ie, anesthesiologist, pathologist). However, the groups, first-line care, public health care and psychiatry, were not applicable to our study as these specialists are not working in hospitals.

Table 2 shows the demographic characteristics of the medical specialists in our study and their mean scores on the different types of work motivation. Missing data were handled per variable because of the already small-sized sample. Some variables did not have any missing data and therefore have the complete number of 193 participants. Other variables did have missing data and therefore have a total participants that are lower than 193. Differences between mean scores were tested for significance by using a *t* test. For differences between types of specialty, ANOVA was used. Medical specialists younger than 50 years of age scored

TABLE 1.

Range of Specialties

	Frequency	Percent	Group
Anesthesiologist	16	8.5	Supportive
Cardiologist	6	3.2	Non-surgical
Surgeon	19	10.1	Surgical
Dermatologist	4	2.1	Non-surgical
Gynecologist	14	7.4	Surgical
Hematologist	1	0.5	Supportive
Intensivist	8	4.2	Non-surgical
Internist	9	4.8	Non-surgical
Pediatrician	20	10.6	Non-surgical
Clinical physiologist	1	0.5	Supportive
Clinical Geriatrician	2	1.1	Non-surgical
Clinical Geneticist	3	1.6	Supportive
ENT specialist	3	1.6	Surgical
Pneumonologist	6	3.2	Non-surgical
Gastro-enterologist	1	0.5	Non-surgical
Medical microbiologist	4	2.1	Supportive
Oncologist	5	2.6	Supportive
Nephrologist	1	0.5	Non-surgical
Neurologist	12	6.3	Non-surgical
Medical nuclear specialist	2	1.1	Supportive
Ophthalmologist	6	3.2	Surgical
Orthopedist	4	2.6	Surgical
Pathologist	7	3.7	Supportive
Clinical Pharmacist	1	0.5	Supportive
Psychologist	3	1.6	Non-surgical
Psychiatrist	5	2.6	Non- surgical
Radiologist	4	2.1	Supportive
Rheumatologist	4	2.1	Supportive
Rehabilitation specialist	7	3.7	Non-surgical
Emergency room specialist	7	3.7	Non-surgical
Urologist	3	1.6	Surgical
Total	189	100	

significantly higher on AM than specialists older than 50 years. More experienced specialists (>15 years) scored significantly lower on CM than specialists who had less experience.

The next step in our analysis was a cluster analysis. Because of the low mean score of specialists on amotivation, with no significant differences for demographic characteristics, we decided to follow the method of Vansteenkiste et al,[25] Kusurkar et al,[26] and Tjin a Tsoi et al[21] and exclude the amotivation scores from our cluster analysis. We conducted a confirmatory factor analyses on the work motivation scale as this was not validated among medical specialists before. The results were as expected and are shown in Table 3. Factor loadings above 0.4 are considered good or significant. Cronbach's alpha was 0.791 for CM and was 0.826 for AM; factor analysis for lifelong learning motivation showed a Cronbach's alpha of 0.848, which indicates good reliability. The total scores of specialists on AM and CM were converted into Z-scores and used for the cluster analysis. All specialists were included in the analysis, and we tried fitting 2-cluster, 3-cluster, 4-cluster, and 5-cluster solutions according to the methods described for cluster analysis. The 4-cluster solution was found to fit the data best. It explained 70.8% of the variance in the AM scores and 54.4% in the CM scores. The four clusters obtained are shown in Table 4. Cluster 1 had a high score on AM and a moderate score on CM, so we labeled it the HAMC profile (for High Autonomous and Moderate CM). Cluster 2 had moderate scores on both AM and CM, so we labeled it the MAMC profile (for Moderate Autonomous and Moderate CM). Cluster 3 had a moderate score on AM and a low score on CM, so we labeled it the MALC profile (for Moderate Autonomous and Low CM). Cluster 4 had a high score on AM and a low score on CM, so we labeled it the HALC profile (for High Autonomous and Low CM). None of the profiles scored low on AM or both AM and CM.

TABLE 2.

Mean Scores on Autonomous Work Motivation (AM), Controlled Work Motivation (CM), and Amotivation for Work

	No. of Respondents, n (%)	Mean AM	Mean CM	Mean Amotivation
Gender				
Male	84 (44.0)	5.66	3.28	1.46
Female	108 (56.0)	5.87	3.35	1.45
F-value		0.543	0.578	0.557
		ns	ns	ns
Age				
<50 y	106 (54.9)	5.89	3.41	1.41
>50 y	87 (45.1)	5.66	3.20	1.50
F-value		4.126	1.114	2.687
		$P < .05$	ns	ns
Years of experience				
<15 y	110 (57)	5.84	3.43	1.46
>15 y	83 (43)	5.71	3.17	1.44
F-value		4.037	1.185	0.314
		ns	$P < .05$	ns
Type of hospital				
Academic	75 (38.9)	5.84	3.30	1.45
Nonacademic	108 (56.0)	5.81	3.38	1.46
F-value		6.506	4.872	1.498
		ns	ns	ns
Type of specialty				
Surgical	49 (25.9)	5.89	3.21	1.45
Nonsurgical	95 (50.3)	5.76	3.39	1.43
Supportive	45 (23.8)	5.68	3.22	1.47
F-value		1.002	1.127	0.049
		ns	ns	ns

Mean scores are based on the multidimensional work motivation scale with a seven-point Likert scale.

TABLE 3.

CFA Factor Loadings on AM and CM and MLL

Item	AM	CM
WM2		1.000
WM3		0.620
WM4		0.996
WM5	1.000	
WM6	0.965	
WM8		0.939
WM9		1.066
WM10		0.808
WM11	0.872	
WM12	1.370	
WM14		0.978
WM15		0.913
WM16		0.961
WM17	1.177	
WM18	1.421	
WM19		0.605

WM1, WM7 and WM13 are the items for amotivation, which are left out because we do not include amotivation in our analysis.

MLL, motivation for lifelong learning.

TABLE 4.

Mean Scores on Autonomous Work Motivation (AM), CM of the Different Motivational Profiles

	HAMC	HALC	MAMC	MALC	% Variance Explained
AM	6.34	6.37	5.22	5.09	70.8
CM	4.16	2.74	3.75	2.43	54.4
No. of cases in the cluster	43	56	55	30	
Motivation for lifelong learning	3.27	3.27	3.01	3.08	

Mean scores are based on the multidimensional work motivation scale with a seven-point Likert scale and the JeffSPL with a four-point Likert scale.

We also investigated differences in the scores on motivation for lifelong learning between all profiles. As Table 4 shows, there is a difference in the scores on motivation for lifelong learning between the different motivational profiles. The profiles that score significantly higher on motivation for lifelong learning are the ones with a high score on AM.

Table 5 and Figure 2 show the results of the demographic characteristics for each profile. Most male specialists (42.7%) were represented in the MAMC profile and most females in both HAMC (29.8%) and HALC (29.8%) profiles. Most specialists under the age of 50 were represented in the HAMC profile (33.0%). Specialists older than 50 years were mostly represented in the MAMC profile (40.5%). Most specialists (31.5%) with less than 15 years of experience were represented in the HAMC profile. Medical specialists with more than 15 years of experience were found predominantly in the MAMC profile (38.0%). Specialists that work in an academic hospital are mostly represented in the HALC profile (39.2%), and regarding specialization, the surgical specialties are also mostly found in this profile (36.7%).

To further compound our understanding of specialist's motivation, we used the subcategories of CM in the analysis. This is because we specifically wanted to see which external regulation, material or social, is more important for a medical specialist. Table 6 shows the scores on the subscales of CM for each motivational profile. The lowest score in all four profiles is on external regulation material, the middle score in all profiles is on external regulations social, and the highest score in all profiles is on introjected regulation, which is the type of motivation closest to AM on the motivation continuum.

TABLE 5.

Demographic Characteristics of the Work Motivation Profiles of Medical Specialists

	HAMC, n (%)	HALC, n (%)	MAMC, n (%)	MALC, n (%)
Gender				
Male	13 (17.1)	27 (32.9)	30 (42.7)	11 (7.3)
Female	30 (29.8)	29 (29.8)	25 (26.0)	19 (14.4)
Age				
<50 y	32 (33.0)	31 (31.1)	26 (27.2)	13 (8.7)
>50 y	11 (13.1)	26 (32.1)	29 (40.5)	17 (14.3)
Years of experience				
<15 y	32 (31.5)	30 (29.6)	30 (29.6)	15 (9.3)
>15 y	11 (13.9)	27 (34.2)	25 (38.0)	15 (13.9)
Type of hospital				
Academic	13 (18.9)	28 (39.2)	22 (32.4)	11 (9.5)
Nonacademic	30 (30.1)	39 (29.1)	29 (33.3)	13 (7.8)
Type of Specialty				
Surgical	13 (27.7)	19 (40.4)	8 (17.0)	7 (14.9)
Nonsurgical	19 (21.1)	25 (27.8)	31 (34.4)	15 (16.7)
Supportive	9 (20.0)	13 (28.9)	15 (33.3)	8 (17.8)

Finally, we conducted a multivariate analysis to have a clearer view of the impact of the demographic variables. First, we calculated correlations by using point bi-serial analysis for all demographic variables, which are shown in Table 7.

After this, a multinomial logistic regression analysis was conducted to get a clearer view of the impact of the demographic characteristics. Table 8 shows the results. This analysis provided us with two significant results that can be found in the HALC profile and it concerns the surgical specialty. However, when using a Bonferroni correction, where the set alpha level becomes 0.01 (as 0.05/5 = 0.01), none of the demographic variables shows a significant result.

DISCUSSION

This study identified the motivational profiles among medical specialists. The aim of this study was to determine whether medical specialists display different motivational profiles and whether these profiles predict differences in motivation for lifelong learning. Although we found four motivational profiles, which is in alignment with previous studies,[20,21,25,26] we did not find the same balance of quality and quantity in these profiles. Medical specialists seem to be on the high and moderate side of the spectrum of AM and the moderate to low side of CM. These findings make it difficult to call this good and poor quality or high and low quantity, as outlined in the previous literature on motivational profiles among pharmacists and medical students.[21,25,26] When we delved into the scores of the specialists on the subcategories of CM, the results showed that external material rewards or punishments had the least influence on their motivation. The scores on CM throughout all four profiles were mostly determined by introjected regulation, which can be seen as the most autonomous or positive part of the continuum when it comes to CM.

Interestingly, we found differences in demographic factors on scores of the different types of motivation. Specialists younger than 50 years of age scored higher on AM. Specialists who had less than 15 years of experience scored higher on CM, which is also found among pharmacists.[21] Pharmacists with work experience for less than 10 years showed negative relationship with participation in CE.[21] These findings seem to contradict each other, but could be explained by acknowledging that physicians' feeling of competence is crucial. Specialists gain competence as they build their experience.

Females are equally represented in the HAMC and HALC profiles. These profiles contain physicians with high AM. This finding aligns with descriptions in the general motivation literature, which suggest that females are more autonomously motivated than males regarding learning.[17] This is also found in the study among pharmacists. Female pharmacists were highly represented in the good quality profile with high AM.[21] However, we did not find any gender differences on the separate scores on AM and CM.

The type of specialization does seem to make a difference as most specialists with a surgical specialization are found in the HALC profile, while the nonsurgical specialties are mostly found in the MAMC profile. Several studies, among medical specialists and laypeople, show a stable prestige hierarchy ranking for specialties, with surgery and cardiology ranking the

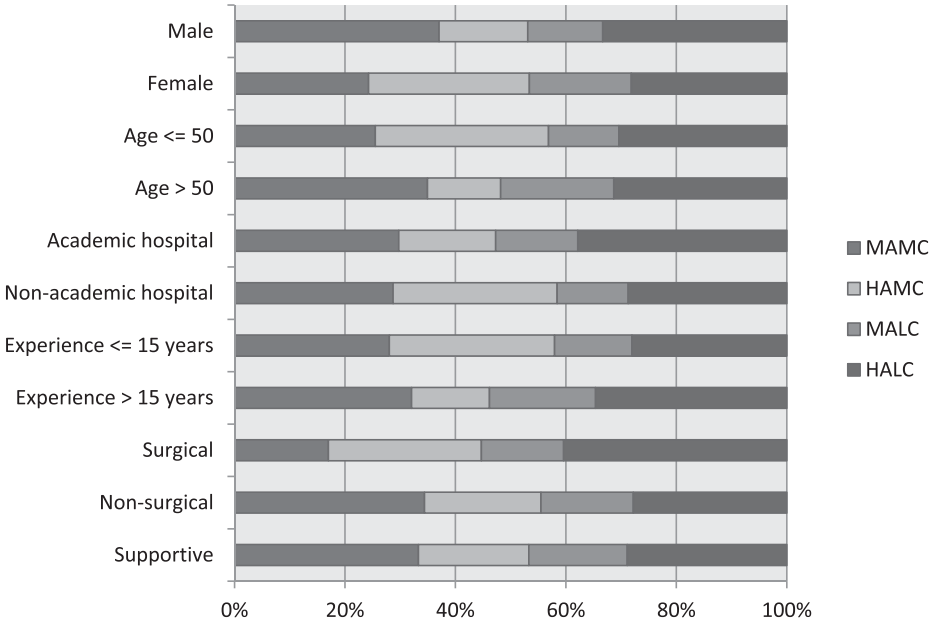

FIGURE 2. Demographic characteristics of the four motivational profiles in %

highest.[31–33] Prestige is defined as regard or esteem and a prestige hierarchy as a scale of regard or esteem.[31] This could be supportive for the perceived autonomy and competence among the surgical specialists. The studies also show that doctors within a medical specialty are viewed as having a common set of personality traits, which appears to be related to the prestige of the specialty.[31] For example, surgeons need to be autonomous when they are in the operating theater and a decision needs to be made on the spot. This provides another reason surgical specialties could experience more autonomy.

At first instance, the multivariate analysis that we conducted also showed that being a medical specialist with a surgical specialty provides more likelihood of having the HALC motivational profile. However, when correcting for type I error by Bonferroni correction, no significant results were found. This could indicate that demographic variables are not predictive of motivational profiles, which could be explained by personality traits being more important for a certain level of motivation than demographic variables. On the other hand, the significance level is quite arbitrary both normally when it is set to 0.05 but also with the Bonferroni correction when in this case it is set to 0.01. The purpose of this study was to show who (what kind of medical specialist) can be found in which motivational profile and some of the odds ratio's that we found are still worth mentioning even when they are just not significant (like age and experience in the HALC profile). To be able to get more insight in what factors are predictive of motivational profiles, more power is probably needed. This contributes to our recommendation that more research on motivation and motivational profiles among (more) medical specialists is necessary.

Because three different types of hospitals participated in this study, we had to consider the different contexts and the influence that this might have on the motivational profiles of medical specialists. Also, looking at the motivational profiles of pharmacists, the type of pharmacy did matter; the pharmacists working in a hospital pharmacy had higher AM.[21] However, the type of hospital did not influence the division among the motivational profiles of the medical specialists. One explanation for our results could be that the included hospitals looked alike, as not only the academic but also the peripheral hospitals were involved, although to a lesser extent, in teaching and research, next to patient care.

Our findings suggest that the older and more experienced medical specialists are, the more they lean toward the moderate side of the motivation spectrum of AM. This finding raises concern because it implies a shift from *high autonomy* and *low* CM toward *moderate autonomy* and *moderate* CM. This is especially important since both high autonomy profiles show positive significant results on motivation for lifelong learning.

TABLE 6.

Mean Scores on the Subscales of CM for Each Motivational Profile

Motivational Profile	Mean Score on External Regulation Material	Mean Score on External Regulation Social	Mean Score on Introjected Regulation	Mean of Total CM Score
HAMC	2.84	3.85	4.36	3.68
HALC	1.70	2.50	3.69	2.63
MAMC	2.95	4.12	5.10	4.06
MALC	1.51	2.54	3.03	3.69

Mean scores are based on the multidimensional work motivation scale with a seven-point Likert scale.

TABLE 7.

Point Bi-Serial Correlations Between All Variables

	Age	Gender	Years of Experience	Type of Hospital	Type of Specialty
Age	1				
Gender	−0.294*	1			
Years of experience	0.854*	−0.311*	1		
Type of hospital	0.017	0.018	0.048	1	
Type of specialism	0.127	−0.83	0.162*	−0.121	1

*p = .05.

TABLE 8.
Multinomial Logistic Regression

Motivational Profile	Variable	B	Exp(B)	Sig.
HAMC	Intercept	−0.174		0.774
	Gender			
	Male	−0.942	0.390	0.048*
	Age			
	<50 y	1.433	4.191	0.109
	Experience			
	<15 y	−0.753	0.471	0.412
	Type of hospital			
	Academic hospital	−0.525	0.592	0.266
	Specialty			
	Nonsurgical	−0.078	0.925	0.888
	Surgical	1.011	2.749	0.133
MALC	Intercept	−0.118		0.853
	Gender			
	Male	−1.042	0.353	0.056
	Age			
	<50 y	−0.419	0.658	0.637
	Experience	−0.437	0.646	0.626
	<15 y			
	Type of hospital			
	Academic hospital	0.252	1.286	0.627
	Specialty			
	Nonsurgical	0.086	1.090	0.888
	Surgical	0.679	1.973	0.379
HALC	Intercept	−0.057		0.916
	Gender			
	Male	−0.509	0.601	0.237
	Age			
	<50 y	1.469	4.343	0.093
	Experience	−1.694	0.184	0.057
	<15 y			
	Type of hospital			
	Academic hospital	0.442	1.556	0.283
	Specialty			
	Nonsurgical	0.151	1.163	0.760
	Surgical	1.362	3.905	0.026*

*$P = .05$.

Thus, a shift from a high to a moderate motivation profile could diminish the motivation for lifelong learning.

Implications for Practice

Continuing professional development is important for future health care, as it secures or provides the level of quality and patient safety. The finding of four motivational profiles could provide more guidance when it comes to the required environment or formats to stimulate AM and lifelong learning in medical specialists. The results also demonstrate that more than half of the medical specialists have a motivational profile that scores higher on CM than the most ideal HALC profile. This means that there is a high percentage of medical specialists that have motivational profiles with a higher risk of poor resilience, lower academic performance, and lower quality of patient care. Now that we are aware of the differences in motivation among specialists, this knowledge can be used to provide each group of specialists with the right support and interventions for practice and lifelong learning according to their motivational profile. According to SDT, there are three basic psychological needs that need to be fulfilled to stimulate the most optimal type of motivation: autonomy (eg, the feeling of choice), competence (eg, the feeling of mastering certain knowledge and skills), and relatedness (eg, the feeling of belonging at work or connected with peers).[17] Further research on these needs among medical specialists is a next step in working toward an environment that stimulates the most ideal motivational profile and, in turn, motivation for lifelong learning in health care. We do suggest that educational activities be customized to fit the motivational profiles and basic psychological needs of medical specialists. When we want to keep our medical specialists motivated and in turn our quality of health care as high as possible, we should provide an autonomy, competence, and relatedness supportive environment for specialists to work and develop in. By supporting these basic needs, the AM is supported which leads to the most optimal motivation specialist can have which in turn provides the most optimal results of our health care professionals. The CE system for medical should be set up in an autonomy, competence, and relatedness supportive manner. This could mean that it should be possible for medical specialists to be able to organize their own time, so they have and they feel like they have the possibility to follow the CE option of their choice. Research shows that specialists experience more autonomy when they organize their own time.[24] Also, the (training) courses, e-learning modules, and other possibilities for CE should be set up in a basic needs supportive way.

Limitations and Future Research

The work motivation scale that we used is validated in many professions; however, it has not been used for health care professionals before. Further validation of this scale among health care professionals is necessary. However, for this study, the scale has been presented to experts for content validity in this particular population and was pilot-tested. It also had good reliability. The response rate of this study might be low; however, a broad range of specialties were represented. It is possible that only highly motivated specialists or those interested in this particular topic participated, which both positively biases the results. The male/female response rate in the sample was 44%/56% compared to a male/female ratio from 57%/43% among the entire group of specialists from all five hospitals in this study. However, as mentioned before, it takes motivated specialists to participate in questionnaires and according to the SDT women are likely to have a higher level of motivation in general.[34] This can also provide an overestimation of the motivational levels. If this is indeed the case, the need to provide each group of specialists with the right support and interventions for practice and lifelong learning according to their motivational profile is even more urgent. Motivational research among medical specialists needs to be repeated in other contexts to confirm our findings, especially because the definition of medical specialists might differ from other countries or contexts. Another important step for future research would be to compare the motivational profiles found in this study with medical specialists' learning behaviors and patient outcomes wherever possible. It remains difficult to compare our results to earlier studies on motivational profiles because we could not add the value of good and poor to our profiles. Also, the measurement of experience of medical specialists in years can be debated on. It seems logical that competence is gained when experience is build up: the older a medical specialist grows the more years of experience. But it does not show the type of experience, as medical specialists can take on other nonclinical responsibilities in their job, especially if they are older, such as

teaching and research. Their experience gets reduced by these other activities. Therefore, other measures for experiences, such as number of procedures or patients seen, can probably be considered. For this study, experience in years is enough to unravel the motivational profiles of medical specialists, even more because in the participating hospital the other nonclinical responsibilities are for every specialists as these are teaching hospitals.

CONCLUSION

Four motivational profiles based on the combination of AM and CM were found among medical specialists, differing in gender, experience and type of specialization. The profiles that have a high score on AM have a positive association with lifelong learning.

Lessons for Practice

- Four motivational profiles were found in medical specialists for work.
- The motivational profiles are associated with medical specialists' demographic characteristics, such as gender, years of experience, and type of specialty.
- The two motivational profiles with a high score on AM are positively associated with motivation for lifelong learning.
- Taking the different motivational profiles in consideration when providing a CE system or educational activities for medical specialists could be valuable.

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REFERENCES

1. Van den Goor MMPG, Wagner CC, Lombarts KMJMH. Poor physicians performance in The Netherlands: characteristics, causes, and prevalence. *J Patient Saf*. 2015. [Epub ahead of print.]
2. Hernandez SE, Conrad DA, Marcus-Smith MS, et al. Patient-centered innovation in health care organizations: a conceptual framework and case study application. *Health Care Manage Rev*. 2013;38:166–175.
3. Tjin a tsoi SLN, de Boer A, Croiset G, et al. Factors influencing participation in continuing professional development: a focus on motivation among pharmacists. *J Contin Educ Health*. 2016;36:144–150.
4. Denton M, Zeytinoglu IU, Davies S, et al. Job stress and job dissatisfaction of home care workers in the context of health care restructuring. *Int J Health Serv*. 2002;32:327–357.
5. Cooper CL, Payne R. *Causes, Coping and Consequences of Stress at Work*. Wiley&Sons, Chichester; 1988.
6. Langelaan M, Broekens MA, de Bruijne MC et al. Monitor Zorggerelateerde schade 2015/2016: dossieronderzoek bij overleden patienten in Nederlandse ziekenhuizen. Available at: https://www.nivel.nl/sites/default/files/bestanden/Rapport_Monitor_Zorggerelateerde_Schade_2017.pdf. Accessed October 1, 2017.
7. Ikenwilo D, Skåtun D. Perceived Need and barriers to continuing professional development among doctors. *Health Policy*. 2014;117:195–202.
8. Lam CF, Gurland ST. Self-determined work motivation predicts job outcomes, but what predicts self-determined work motivation? *J Res Pers*. 2008;42:1109–1115.
9. Richer SF, Blanchard C, Vallerand RJ. A motivational model of work turnover. *J Appl Soc Psychol*. 2002;32:2089–2113.
10. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol*. 2000;55:68–78.
11. Kusurkar RA, Croiset G, Mann KC, et al. Have motivation theories guided the development and reform of medical education curricula? A review of the literature. *Acad Med*. 2012;87:735–743.
12. Deci EL, Ruan RM. Facilitating optimal motivation and psychological well-being across life's domains. *Can Psychol/Psychol Can*. 2008;49:14.
13. Kusurkar RA, Ten Cate TJ, van Asperen M, et al. Motivation as an independent and a dependent variable in medical education: a review of the literature. *Med Teach*. 2011;33:242–262.
14. Ten Cate TJ, Kusurkar RA, Williams GC. How self-determination theory can assist our understanding of the teaching and learning processes in medical education. AMEE Guide No. 59. *Med Teach*. 2011;33:961–973.
15. Guay F, Ratelle CF, Chanal J. Optimal learning in optimal contexts: the role of self-determination in education. *Can Psychol/Psychol Can*. 2008;49:233.
16. Kusurkar RA, Ten Cate TJ, Vos CM, et al. How motivation affects academic performance: a structural equation modelling analysis. *Adv Health Sci Educ Theor Pract*. 2013;18:57–69.
17. Deci EL, Ryan RM. *Handbook of Self-Determination Research*. Rochester, NY: The university of Rochester Press; 2002.
18. Vallerand RJ. Deci and Ryan's self-determination theory: a view from the hierarchical model of intrinsic and extrinsic motivation. *Psychol Inq*. 2000;11:312–318.
19. Ryan RM, Deci EL. Intrinsic and extrinsic motivations: classic definitions and new directions. *Contemp Educ Psychol*. 2000;25:54–67.
20. Ratelle CF, Guay F, Vallerand RJ, et al. Autonomous, controlled, and amotivated types of academic motivation: a person-oriented analysis. *J Educ Psychol*. 2007;99:734–746.
21. Tjin a tsoi SLN, de Boer A, Croiset G, et al. Unravelling motivational profiles of healthcare professionals for continuing education: the example of pharmacists in The Netherlands. *J Contin Educ Health*. 2016;36:46–54.
22. Williams G. Improving health through supporting the autonomy of patients and providers. In: Richard M Ryan, Edward L Deci, eds. *Handbook of Self-Determination Research*. Rochester, NY: University of Rochester Press; 2004:233–254.
23. Stajkovic AD, Luthans F. Business Ethics across cultures: a social cognitive model. *J World Bus*. 1997;32:17–34.
24. Van der Burgt SME, Kusurkar RA, Croiset G, et al. Exploring the situational motivation of medical specialists: a qualitative study. *Int J Med Educ*. 2018;9:57–63.
25. Vansteenkiste M, Sierens E, Soenens B, et al. Motivational profiles from a self-determination perspective: the quality of motivation matters. *J Educ Psychol*. 2009;101:671–688.
26. Kusurkar RA, Croiset G, Galindo-Garré F, et al. Motivational profiles of medical students: association with study effort, academic performance and exhaustion. *BMC Med Educ*. 2013;19:87.
27. Gagné M, Forest J, Vansteenkiste M, et al. The multidimensional work motivation scale: validation evidence in seven languages and nine countries. *Eur J Work Organizational Psychol*. 2014;24:178–196.
28. Hojat M, Veloski J, Nasca TJ, et al. Assessing physicians' orientation toward lifelong learning. *J Gen Intern Med*. 2006;21:931–936.
29. Beaton DE, Bombardier C, Guillemin F, et al. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine*. 2000;25:3186–3191.
30. Monitor for specialty choices in medical education Netherlands 2015. Available at: https://www.nivel.nl/sites/default/files/bestanden/keuzemonitor_geneekunde_2015.pdf. Accessed September 1, 2017.
31. Creed PA, Searle J, Rogers ME. Medical specialty prestige and lifestyle preferences for medical students. *Soc Sci Med*. 2010;71:1084–1088.
32. Norredam M, Album D. Prestige and its significance for medical specialties and diseases. *Scand J Public Healt*. 2007;35:655–661.
33. Rosoff SM, Leone MC. The public prestige of medical specialties: overviews and undercurrents. *Soc Sci Med*. 1991;32:321–326.
34. Kusurkar RA, Croiset G. Ten Cate ThJ. Implications of gender differences in motivation among medical students. *Med Teach*. 2013;35:173–174.