

The Role of Motivation in Continuing Education for Pharmacists



Sharon Tjin A Tsoi

**THE ROLE OF MOTIVATION IN
CONTINUING EDUCATION FOR PHARMACISTS**

Sharon Tjin A Tsoi

The work described in this thesis was funded by PAOFarmacie.
It was conducted at the Utrecht University and VUmc School of Medical Sciences.

Financial support for publication of this thesis was kindly provided by:
Utrecht University, PAOFarmacie & Nederlandse Vereniging voor Medisch Onderwijs

Design, layout & printing: ProefschriftMaken | www.proefschriftmaken.nl

ISBN: 9789462956865

©Sharon Tjin A Tsoi 2017

All rights reserved. No part of this thesis may be reproduced or transmitted in any means, electronic or mechanical, including photocopy, recording or otherwise without permission of the author.

THE ROLE OF MOTIVATION IN CONTINUING EDUCATION FOR PHARMACISTS

De Rol van Motivatie bij Nascholing van Apothekers

(met een samenvatting in het Nederlands)

PROEFSCHRIFT

ter verkrijging van de graad van doctor
aan de Universiteit Utrecht
op gezag van de Rector magnificus, prof. dr. G.J. van der Zwaan,
ingevolge het besluit van het college voor promoties
in het openbaar te verdedigen op
woensdag 4 oktober 2017 des middags te 12.45 uur

door

Sharon Tjin A Tsoi

geboren op 2 december 1966
te Paramaribo, Suriname

Promotoren: Prof. dr. A. de Boer
Prof. dr. G. Croiset

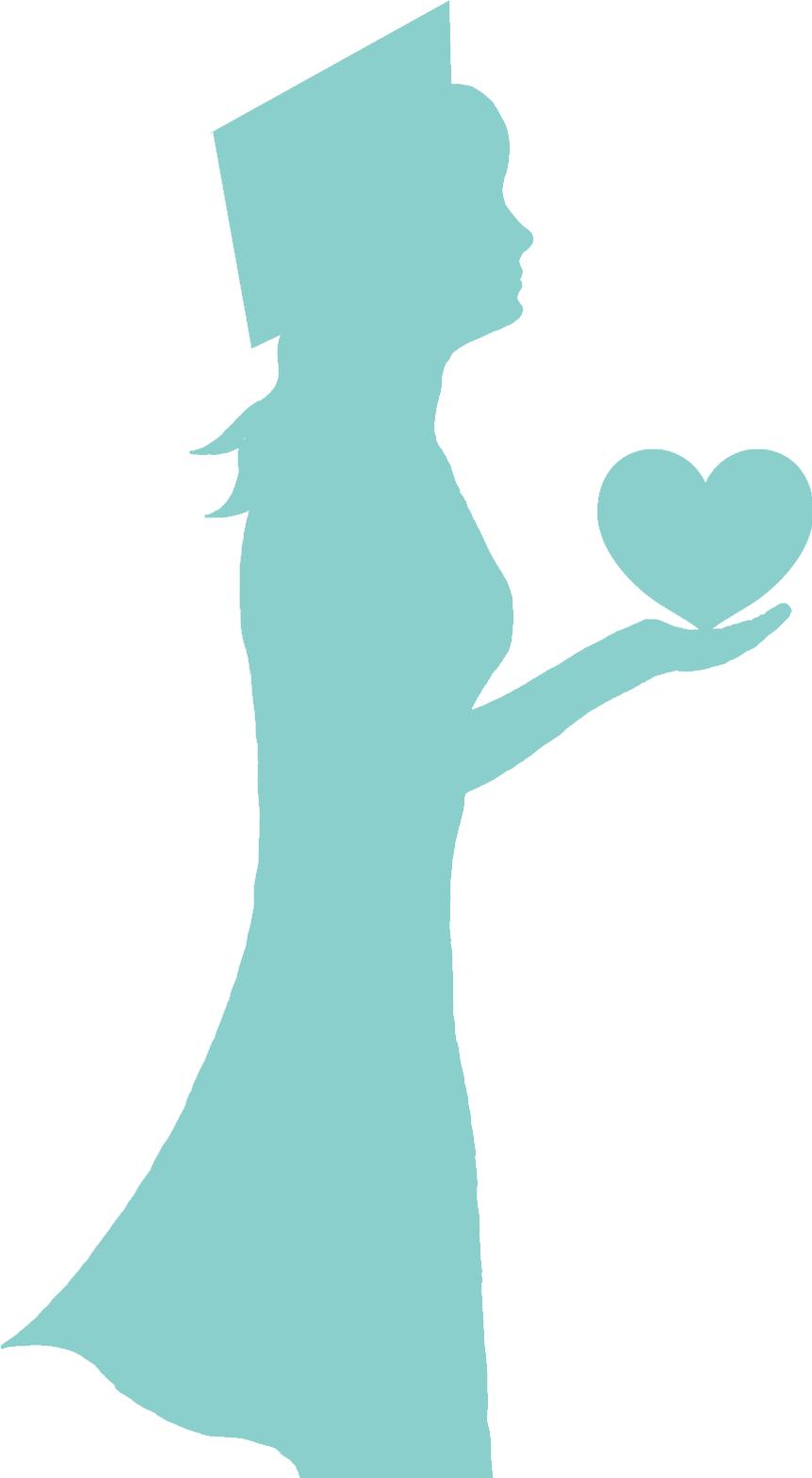
Copromotoren: Dr. R.A. Kusurkar
Dr. A.S. Koster

*Voor Wim, Laura, Amy
&
mijn moeder en vader*

TABLE OF CONTENTS

| | page |
|---|------|
| Chapter 1 General Introduction | 9 |
| Chapter 2 Motivation | 31 |
| Unraveling Motivational Profiles of Healthcare Professionals for Continuing Education: the Example of Pharmacists in the Netherlands | |
| Chapter 3 Motivation and Participation in CE | 57 |
| Factors Influencing Participation in Continuing Professional Development: a Focus on Motivation among Pharmacists | |
| Chapter 4 Dynamics of Motivation | 83 |
| Exploring Changes in the Motivation of Dutch Pharmacists with respect to the Current Continuing Education System: a Longitudinal Approach | |
| Chapter 5 The Route from Motivation to Vitality and Learning Outcomes | 109 |
| How Basic Psychological Needs and Motivation affect Vitality and Lifelong Learning Adaptability of Pharmacists: a Structural Equation Model | |
| Chapter 6 Perspectives | 135 |
| Regaining Passion in Healthcare Professionals by Designing a Motivating System for Continuing Education and Continuing Professional Development | |

| | | |
|------------------|---|------------|
| Chapter 7 | General Discussion | 151 |
| | Motivating and Vitalizing Professional Development for Pharmacists. What can we Learn from Research and Others? | |
| Chapter 8 | English Summary | 185 |
| | Samenvatting | 191 |
| | Dankwoord | 200 |
| | Curriculum Vitae | 207 |
| | List of Publications, Presentations and PhD Courses | 209 |



CHAPTER 1

General Introduction

*"Lifelong learning and motivation are indistinguishable:
the motivated person is a lifelong learner, and the lifelong
learner is a motivated person."*

-McCombs 1991-

“Medical errors now third leading cause of death in United States”

(Washington Post, May 3, 2016)

“REPORT ON FATAL MEDICAL ERRORS HIGHLIGHTS NEED FOR MORE TRANSPARENCY”

(Fox News Health, June 24, 2016)

“Action initiated against medics for poor performance”

(Dawn, January 10, 2017)

“PREVENTABLE HOSPITAL ADMISSIONS INCREASE DUE TO MEDICATION ERRORS “

(Platform for Victims of Medical errors, Feb 1, 2017)

GENERAL INTRODUCTION

Patient safety is jeopardized by the poor performance of healthcare professionals that is characterized by medication errors such as incorrectly evaluating the treatment, prescribing unauthorized drugs or administering the wrong doses.^{5,6} Furthermore, burnout and decreased well-being is increasing being seen among healthcare professionals.⁷ These negative trends could be a trigger for poor performance or the other way around. Because poor performance is in part caused by a lack of professional development, effective postgraduate development for all healthcare workers should be pursued.^{6,8}

As learning and professional development is mentioned as a possible energy resource, motivating/energizing strategies for professional development should be studied. Aside from knowledge and skills, professional development should also emphasize professional values, self-reflection and collaboration which in turn might lead to a higher quality of patient care.⁶ In addition, quick changes in healthcare like new developments in drugs and therapies, and a more demanding society require that the knowledge, skills and competencies of the healthcare professionals are up-to-date and fit-for-practice.

This introductory chapter addresses the following:

- the global strategies for improving lifelong learning in healthcare professionals and especially pharmacists
- the context of pharmacy education in the Netherlands, in which the research studies in this thesis were conducted
- arguments for using the ‘motivation lens’ in this study and a conceptual model for the relationship between pharmacists’ motivation in Continuing Education (CE), professional performance and patient care
- the broad and specific research questions

Continuing Education (CE) and Continuing Professional Development (CPD) as Strategies for Lifelong Learning in Pharmacy

Lifelong learning, CPD and CE are often used interchangeably, however there is a clear differentiation between these concepts (see Table 1). Lifelong learning started out to develop the workforce, but it also covers lifewide learning in home contexts and social settings, e.g. using new appliances such as smartphones, and therefore is a broader concept than CPD. CPD includes an ongoing cycle of learning to enhance skills and knowledge that will lead to improved performance during employment.¹¹⁻¹³ CPD is considered as an integral part of the workplace and is defined as “the systematic maintenance, improvement and broadening of knowledge and skills, and the development of personal qualities necessary for the execution of professional and technical duties throughout the individual’s working life”.¹⁴ Learning in CPD is also determined by informal learning in the day-to-day clinical practice setting like peer group and workplace-based learning.¹⁵ CE is defined as a formal structured educational experience or activity (face-to-face or e-learning) with the aim of improving professional practice (promoting problem solving, critical thinking and thus patient care) to support continuing professional development and is therefore an essential part of CPD.^{11,12}

Various review studies questioned the effectiveness of the CE strategies used in the late 1990s and early 2000s.^{10,16,17} It was concluded that educational activities like CE can improve professional practice and patient outcomes.¹⁷ However, the effect of CE on patient outcomes varies from small to nil, depending on the strategy of the educational activity.¹⁷ Besides using mixed interactive and didactic formats, giving professionals a more participatory role in their learning could make CE programs more effective.^{10,17}

In 2002 the concept of CPD was officially described for pharmacists by the International Pharmaceutical Federation (FIP) as “the responsibility of individual pharmacists for systematic maintenance, development and broadening of knowledge, skills and attitudes, to ensure continuing competence as a professional, throughout their careers”.²¹ Adopting this concept in the global pharmacy workforce emphasizes pharmacists’ own responsibility for their professional development and calls for the development of self-regulated learning skills. In 2004 Rouse introduced a CPD model that includes the portfolio as an integral part (Figure 1).¹² There are four stages in this model that are centered around recording the actions in a portfolio as a key tool of the learning process: 1) reflection: thinking about your practice, 2) planning: deciding what and how to learn, 3) action: joining the planned learning activity and 4) evaluation: identifying the benefits of your learning.^{12,21,22}

Table 1. Definitions of Lifelong Learning, Continuing Professional Development and Continuing Education^{11,12,18-20}

| Term | Definition |
|---|---|
| Lifelong Learning (LLL) | All learning activity undertaken throughout life (employment, but also related to personal and social settings) to improve knowledge, skills and competencies |
| Continuing Professional Development (CPD) | An ongoing, systematic outcome-focused cyclical approach that entails different stages to enhance professional development throughout the working life. |
| Continuing Education (CE) | A formal structured educational activity to enhance and maintain knowledge, skills and competencies of professionals to support CPD. |

CE and CPD are implemented in various ways, spanning from traditional CE to full implementation of a CPD approach, across the globe for pharmacists and other healthcare professionals.^{18,23,24} More and more countries opt for a mandatory approach (Portugal, New Zealand, UK), while others (Finland) have chosen for a voluntary engagement in CE.^{21,23} Different studies report that CE alone is insufficient for meeting the lifelong learning needs of the healthcare professionals and that the implementation of CPD leads to improved pharmacy practice and interactions with healthcare providers.²⁵⁻²⁷ Although there are many benefits of a CPD approach (better improvement in learning behavior) compared to only CE participation,^{25,27} important barriers like *time*, *lack of motivation* and *poor understanding of the CPD concept* frequently prevent this approach from being successfully implemented.²³ Widespread effective CE and CPD implementation needs additional research into objective outcomes like self-directed professional performance and international collaboration to establish best practices.

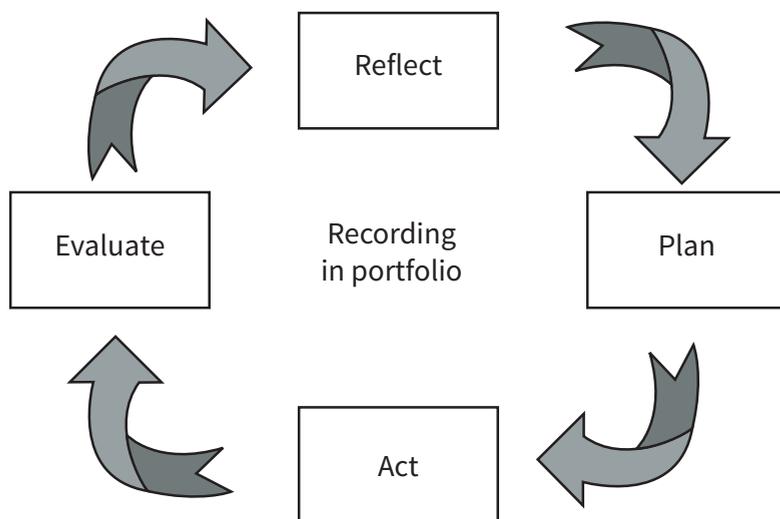


Figure 1. CPD Cycle with the Different Stages based on Rouse 2004¹²

Pharmacy Education in the Netherlands

Pharmacy education in the Netherlands is delivered by three pharmacy schools situated in Groningen, Utrecht and Leiden. Each school has its own curriculum and special focus. Groningen has an *analytical* focus, Utrecht a *pharmacotherapeutic* focus and Leiden a *clinical* focus. Despite these differences all three schools are in close consultation about the upcoming trends in pharmacy workforce and acknowledge the shift of pharmacy care from drug-centered to patient-centered. Recently, the framework of legislation and learning outcomes of graduated pharmacists' knowledge, skills and competencies have been updated in a collaborative report coordinated by the Royal Dutch Pharmaceutical Society (KNMP).²⁸

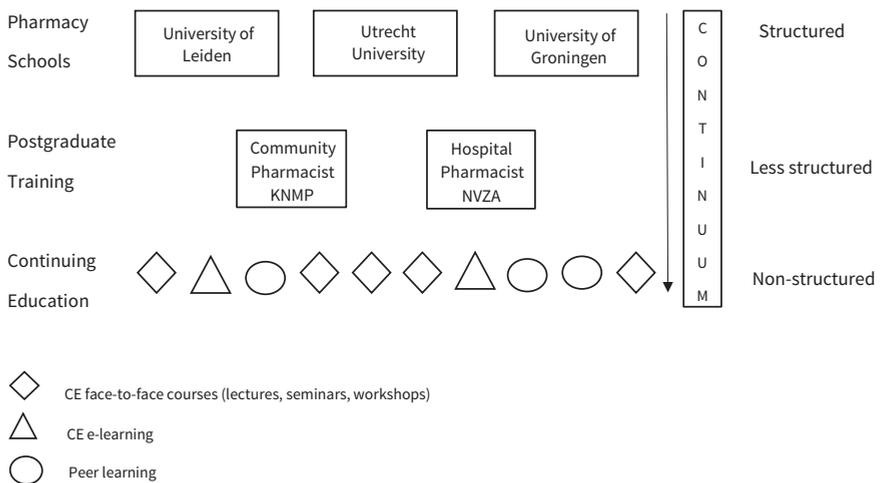


Figure 2. Flow Diagram of the Pharmacy Learning Context in the Netherlands

After graduating from pharmacy school, Dutch pharmacists can continue with postgraduate training. There are two types of postgraduate training acknowledged by the ministry: the specialization to become a registered community pharmacist (CP) and the specialization to become a registered hospital pharmacist (HP). The training program to become a CP is

regulated by the Royal Dutch Pharmaceutical Society (KNMP)²⁹ and the training program to become an HP is regulated by the Dutch Association of Hospital Pharmacists (NVZA).³⁰ Each association has its own educational director and has developed its own learning requirements and regulations. Training to become a CP is of two years on average and training to become an HP is four years.

Reregistration every five years is mandatory for both CPs and HPs and requires a minimum of 200 hours of CE activities starting at registration, and every 5 years thereafter. Accreditation is obligatory for every single CE activity (per year or two years) according to the regulations of both associations. The same CE activity can be accredited for both CPs and HPs, if it follows both regulations. However, accreditation is applied separately for both groups. Examples of accredited CE activities are face-to-face lectures, workshops and conferences, but also e-learning courses. Informal learning by joining peer groups with general practitioners, teaching and writing papers can also individually be accredited afterwards. Since 2015, the regulations for CPs have been revised and now demand more distinctive CE participation according to the CanMEDS competency framework.³⁰ For instance, training in competencies like collaboration and communication should cover at least 40 hours in five years. Assessment driven/reflective learning like peer group learning is an extra requirement (a minimum of 10 hours and a maximum of 50 hours in five years) in the new regulations for CPs.

Continuing Education in the Netherlands is provided by a very heterogeneous group. In 2001, a non-commercial institution (PAOFarmacie) was founded by universities and pharmacists associations to organize and develop high quality postgraduate courses. However, commercial parties like pharmaceutical companies and privately owned institutions are also allowed in this market.

At first, pharmacists in the Netherlands experience pharmacy education in a structured context (pharmacy schools), then in a less structured context (postgraduate training) and finally in a non-structured context (CE system). Therefore, it is difficult to ensure the quality of the current CE system for Dutch pharmacists (Figure 2).

The Role of Motivation in CE/CPD Participation

An exploratory study was conducted by PAOFarmacie in 2011,³¹ based on the questions: “What is in general your motivation to attend a CE course?” and “What type of continuing education do you prefer?”. Two groups of pharmacists emerged based on how they answered the question on motivation.³⁰ These groups differed in their gender composition, working hours and preferences for lectures or blended learning. Because this pilot study was executed in an exploratory way, we decided to conduct additional focus group sessions to help us with the design of the final research proposal. The focus group sessions were moderated in a semi-structured manner and the discussion was focused on enablers and barriers for CE participation. Practical enablers like, “*CE activities located nearby*” and “*CE activities for just a few hours instead of a whole day*” were mentioned. Another important factor mentioned was the teacher/expert, which could be both an enabler (if the expert was well-known for his or her good quality lectures) and a barrier (if the expert/teacher was unknown or couldn’t show that he or she knew more about the theme than the audience) for attending CE. Extrinsic stimulators like accreditation points, questions from patients, and financial incentives were mentioned as reasons to attend CE activities.

“This has been an issue for the past 20 years. I am not sure if we should address this issue at the moment, but as a professional it should be internally motivated to keep your knowledge and skills up-to-date for your profession. It comes with the territory and we have a so called “independent” ethical profession. This should be enough to participate without financial incentives, but it doesn’t work that way.”

“The accreditation points for some colleagues, I don’t need them, but there are a lot of colleagues that need a lot of accreditation points.”

Barriers mentioned for CE participation were *costs, distance to the activity, uninteresting subjects and time constraints.*

In earlier studies, the quality of CE and CPD frameworks was determined by attitudes, beliefs, facilitators and barriers for healthcare professionals’ CE/CPD participation.^{23,32-38} The barriers identified include *time constraints, lack of resources, support and lack of motivation.* For Scottish pharmacists, motivation for CPD was a factor that affected their attitudes towards CPD.³⁷ Our conclusion was that the views that emerged from our focus group sessions are supported by the global views of CE/CPD enablers and barriers.

Because motivation seems to play a crucial role both as an enabler and barrier in pharmacists’ engagement in CE, we were interested in how we could preserve motivation as an enabler. Furthermore, educational psychologists emphasize that learning and motivation should be more integrated to ensure that professionals maintain a positive attitude towards and a positive perception of lifelong learning to meet the needs of current practice.⁹

The Self-Determination Theory

The Self-Determination Theory (SDT)³⁹ of Deci and Ryan provided us with the right tools to investigate how we could preserve motivation as an enabler for pharmacists' engagement in CE/CPD. SDT originated from human psychology (*Organismic Integration Theory* (OIT)) and is based on the assumption that humans have a natural tendency to grow. This growth is stimulated by necessary nutriments provided by their social environment and can lead to internalization of an activity that was initiated externally. In other words, there are fundamental supports that individuals must have to thrive. This motivation theory can be applied to several life domains like parenting, educational settings, patient care and organizational settings. Unlike other theories, SDT emphasizes the importance of the quality of the motivation instead of the quantity and classifies motivation into mainly two types: intrinsic and extrinsic.

Intrinsic motivation is characterized as a state of doing an activity out of genuine interest and extrinsic motivation is characterized as a state of doing an activity to obtain rewards like a raise or avoid punishments like getting fired. Amotivation is characterized as a state of no action at all (passive state) that results from feeling unable to achieve something or not valuing the activity or outcome. Extrinsic motivation is classified into four regulations based on the extent of self-determination. These regulations are arranged along a continuum from nonself-determined to self-determined (Figure 3). *External regulation* is the least self-determined form of extrinsic motivation, followed by *Introjected regulation*, *Identified regulation* and *Integrated regulation*, which is the most self-determined form. In other words, *External regulation* involves no internalization of the activity, *Introjected regulation* involves partial internalization in a superficial sense (this form is still quite controlling and is performed to avoid guilt and shame or to attain ego enhancement), *Identified regulation*

involves conscious valuing and acceptance of the activity as personally important and *Integrated regulation* involves identified activities that are personally endorsed and become a part of the self.

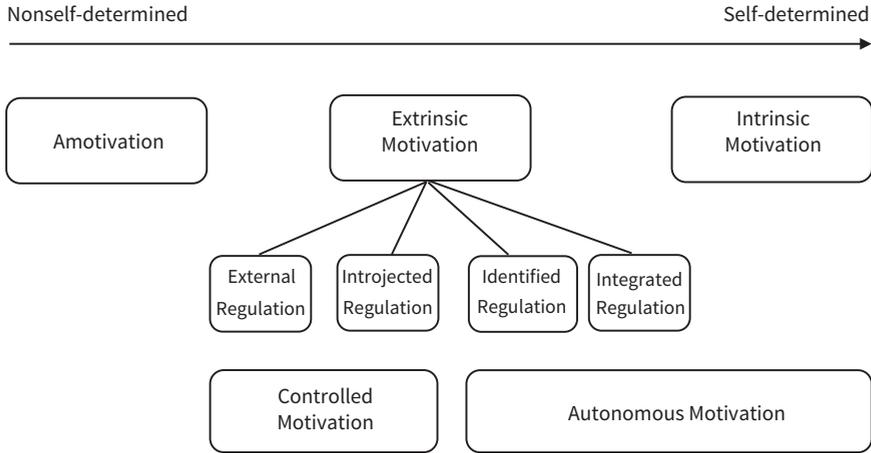


Figure 3. The Self-Determination continuum of motivation (adapted from Ryan & Deci 2000)³⁹

External and introjected regulations are frequently merged to represent controlled motivation (CM) and identified regulation and intrinsic motivation are merged to represent autonomous motivation (AM).^{38,41} AM has been found to be associated with well-being and positive learning outcomes like deep learning and good study strategies.^{41,42} CM has been found to be associated with outcomes like ill-being (burnout) and negative learning behaviors like procrastination and surface learning.⁴²⁻⁴⁴

Levels, Dynamics and the Role of Basic Psychological Needs in Motivation

Motivation is a complex and dynamic construct that exists at three different hierarchical levels: the global level, the contextual level and the situational level.⁴⁵ Motivation at the

global level refers to personal traits, e.g. somebody with an intrinsically motivated personality is probably motivated for a lot of general life contexts. Motivation at the *contextual level* refers to life contexts like education, sports and making music. Finally, motivation at the *situational level* refers to specific activities within the life contexts, e.g. specific lessons at school, rehearsing for piano lessons etc.

Motivation is influenced at the different levels depending on the impact of other individuals like teachers and piano instructors. Motivation is mostly steady at the global level and the least stable at the situational level. Recursive top-down and bottom-up effects between the different levels are described, e.g. if a person repeatedly experiences intrinsically motivating activities at the situational level, motivation at the contextual level will be facilitated and vice versa.

The change of motivation from extrinsic to intrinsic and vice versa depends on fulfillment or frustration of three *basic psychological needs* (BPN): autonomy, relatedness and perceived competence (defined in Table 2). When needs are satisfied well-being is promoted, but when needs are frustrated this could lead to negative consequences like ill-being and even psychopathology. The process of need satisfaction that promotes health is the same across all cultures and groups.⁴⁶

Table 2. The Definitions of Autonomy, Perceived Competence and Relatedness, the three Basic Psychological Needs from Self-Determination Theory

| Basic Psychological Need | Definition |
|--------------------------|---|
| Autonomy | Feeling of choice while carrying out an activity |
| Perceived Competence | Feeling effective and capable of achieving desired outcomes |
| Relatedness | The experience of belonging and connection to others |

Conceptual Model of CE/CPD, Motivation and Patient Care

Investigating pharmacists' motivation in their CE context could shed light on certain pathways that could lead to better patient outcomes. SDT as a theoretical framework can provide us tools to discover what pharmacists need to develop self-regulating learning skills which are essential to successfully implement a CE/CPD system. In such a system pharmacists can take their own responsibility for their professional development just like the FIP statement²¹ calls for. Figure 4 shows how the concept of an *autonomy-supportive* learning environment, based on fulfillment of pharmacists' BPN, could lead to better patient care.

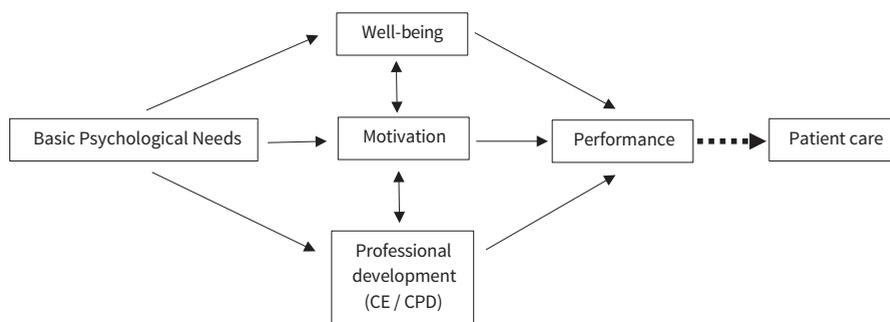


Figure 4. The Conceptual Model of an Autonomy-Supportive CE/CPD Model leading eventually to Better Patient Care

OUTLINE OF THE THESIS

This thesis focuses on studies performed among Dutch pharmacists in their CE learning context, thus motivation at the contextual level. Since we wanted to have an overall picture, we approached pharmacists in training (both CP and HP) and trained pharmacists during CE courses organized by PAOFarmacie. This thesis intends to shed light on pharmacists' motivation in CE, their learning behavior and measures that could help design a sustainable CE/CPD format and system.

Broad research questions based on this initial study were:

1. Exploring pharmacists' motivation in CE. What is the quality and quantity of their motivation?
2. What factors (including motivation) influence pharmacists' CE participation?
3. What are the changes in pharmacists' motivation in CE over a few years?
4. How can we include pharmacists' motivation in the design of a CE learning environment/system?

Chapter 2 describes a first exploration of pharmacists' motivation in CE. This study explored the quality and quantity of pharmacists' motivation and explored what motivational profiles exist among pharmacists. We also investigated how these profiles vary in certain demographic characteristics.

In *chapter 3*, we aimed to find factors that might influence pharmacists' CE participation. CE participation by pharmacists was measured in terms of hours invested in CE courses. In this study we tried to gain an understanding of various factors such as demographics that influence attendance at CE activities, with a special focus on motivation.

Chapter 4 shows the longitudinal approach that we used to explore possible changes of pharmacists' motivation over time. In this study we tried to gain insight into the dynamics of motivation using three time points. In this chapter, the way the current CE system possibly affects Dutch pharmacists' motivation is addressed.

Chapter 5 assesses structural relations between basic psychological needs (BPN), academic motivation, well-being and lifelong learning outcomes. Understanding the pathway to learning outcomes provides us information about certain measures that CE providers and regulators in pharmacy education can take to achieve the best learning outcomes.

Chapter 6 proposes redesigning the CE system in the Netherlands as a possible way to help pharmacists regain their passion for work. Best practices and tips for a motivating CE/CPD system are suggested.

Chapter 7 starts with a critical evaluation of the findings of the studies, followed by recommendations for possible changes in the current CE system of Dutch pharmacists and future research questions.

Chapter 8 summarizes the studies and states the conclusions of this thesis.

REFERENCES

1. The Washington Post. *Researchers: Medical errors now third leading cause of death in United States*. By Ariana Eunjung Cha. 2017. Available at: https://www.washingtonpost.com/news/to-your-health/wp/2016/05/03/researchers-medical-errors-now-third-leading-cause-of-death-in-united-states/?utm_term=.cdc676c6c136 Accessed March 2017.
2. Fox News Health. *Dr. Manny: Report on fatal medical errors highlights need for more transparency*. By Manny Alvarez. 2016. Available at: <http://www.foxnews.com/health/2016/06/24/dr-manny-report-on-fatal-medical-errors-highlights-need-for-more-transparency.html> Accessed March 2017.
3. Dawn e-paper. *Action initiated against Medics Poor Performance*. By Ashfaq Yusufzai. 2016. Available at: <https://www.dawn.com/news/1307546/action-initiated-against-medics-for-poor-performance> Accessed March 2017.
4. SIN-NL Nieuws platform van slachtoffers van medische fouten. *Aantal vermijdbare opnames stijgt door medicatieproblemen*. By Ana Karadarevic. 2017. Available at: <http://www.sin-nl.org/doofpot/doofpot-medicatiefouten/> Accessed March 2017.
5. Barker KN, Flynn EA, Pepper GA, Bates DW, Mikeal RL. Medication errors observed in 36 health care facilities. *Arch Intern Med*. 2002;162(16):1897-1903.
6. Van den Goor MM, Wagner CC, Lombarts KM. Poor Physician Performance in the Netherlands: Characteristics, Causes, and Prevalence. *J Patient Saf*. 2015.
7. Quicksan “Bezieling in de zorg”. 2014. Available at: http://www.beroepseer.nl/images/stories/documenten/samenvatting_onderzoek_zorgprofessionals_vvaa_2014.pdf Accessed March 2017.
8. Brady A, Malone A, Fleming S. A literature review of the individual and systems factors that contribute to medication errors in nursing practice. *J Nurs Manag*. 2009;17(6):679-697.
9. McCombs BL. Motivation and lifelong learning. *Educational psychologist*. 1991;26(2):117-127.
10. Griscti O, Jacono J. Effectiveness of continuing education programmes in nursing: literature review. *J Adv Nurs*. 2006; 55(4):449-456.

11. Murphy C, Cross C, McGuire D. The motivation of nurses to participate in continuing professional education in Ireland. *J Eur Ind Train.* 2006;30(5):365-384.
12. Rouse MJ. Continuing professional development in pharmacy. *J Pharm Technol.* 2004;20(5):303-306.
13. Garofano CM, Salas E. What influences continuous employee development decisions? *Hum Resour Manage R.* 2005;15(4):281-304.
14. Friedman A, Phillips M. The role of mentoring in the CPD programmes of professional associations. *Int J Lifelong Educ.* 2002;21(3):269-284.
15. Billet K. *Tobacco use among nursing students: prevalence, attitudes and education.* Doctoral dissertation, University of Pittsburgh; 2014.
16. Davis D, O'Brien MAT, Freemantle N, Wolf FM, Mazmanian P, Taylor-Vaisey A. Impact of formal continuing medical education: do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or health care outcomes? *Jama.* 1999;282(9):867-874.
17. Forsetlund L, Bjorndal A, Rashidian A, et al. Continuing education meetings and workshops: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev.* 2009;2(2).
18. The *Review of International CPD Models* report of the *Pharmaceutical Society of Ireland (PSI)*. Available at: [https://www.google.nl/search?q=7.%09The+Review+of+International+CPD+Models+report+of+the+Pharmaceutical+Society+of+Ireland+\(PSI\).&ie=utf-8&oe=utf-8&client=firefox-b-ab&gfe_rd=cr&ei=8cU6WJ2QOYbH8AferY34Bg](https://www.google.nl/search?q=7.%09The+Review+of+International+CPD+Models+report+of+the+Pharmaceutical+Society+of+Ireland+(PSI).&ie=utf-8&oe=utf-8&client=firefox-b-ab&gfe_rd=cr&ei=8cU6WJ2QOYbH8AferY34Bg). Accessed June 2010.
19. Accreditation Council for Pharmacy Education – ACPE. *Definition of Continuing Education for the Profession of Pharmacy.* Released January 2007, on-line. Available at :<https://www.acpe-accredit.org/pdf/S2007Guidelines2.0ChangesIdentifiedInRed.pdf> Accessed March 2017.
20. Tran D, Tofade T, Thakkar N, Rouse M. US and international health professions' requirements for continuing professional development. *Am J Pharm Educ.* 2014;78(6):129.

21. International Pharmaceutical Federation – FIP. *FIP statement of Professional Standards Continuing Professional Development*. 2002. The Hague, The Netherlands: International Pharmaceutical Federation (online). Available at: https://www.fip.org/www/uploads/database_file.php?id=221&table_id Accessed March 2017.
22. Accreditation Council for Pharmacy Education–ACPE. *Continuing Professional Development* (on-line). 2014. Available at: https://www.acpe-accredit.org/pdf/CPE_Standards_Final.pdf Accessed March 2017.
23. International Pharmaceutical Federation – FIP. *Continuing Professional Development/ Continuing Education in pharmacy: Global Report*. 2014. Available at: http://fip.org/files/fip/PharmacyEducation/CPD_CE_report/FIP_2014_Global_Report_CPD_CE_online_version.pdf Accessed March 2017.
24. Donyai P, Herbert RZ, Denicolo PM, Alexander AM. British pharmacy professionals' beliefs and participation in continuing professional development: a review of the literature. *Int J Pharm Pract*. 2011;19(5):290-317.
25. Dopp AL, Moulton JR, Rouse MJ, Trewet CB. A five-state continuing professional development pilot program for practicing pharmacists. *Am J Pharm Educ*. 2010;74(2):28.
26. Tofade T, Foushee L, Chou S, Caiola SM, Eckel S. Continuing professional development training program among pharmacist preceptors and nonpreceptors. *J Am Pharm Assoc*. 2010;50(6):730-735.
27. McConnell KJ, Newlon CL, Delate T. The impact of continuing professional development versus traditional continuing pharmacy education on pharmacy practice. *Ann Pharmacother*. 2010;44(10):1585-1595.
28. *Domeinspecifiek Referentiekader en Raamplan 2016*. Available at: <https://www.knmp.nl/downloads/domeinspecifiek-referentiekader-en-raam-plan-farmacie-2016.pdf> Accessed March 2017.
29. KNMP. *Opleidingsplan Specialisme Openbare Farmacie 2015*. Available at: <https://www.knmp.nl/downloads/opleidingsplan-specialisme-openbare-farmacie-2015.pdf/view> Accessed March 2017.
30. KNMP. *Opleidingseisen Ziekenhuisfarmacie ELOZ 3*. Available at: <https://www.knmp.nl/downloads/opleidingseisen-ziekenhuisfarmacie-eloz-iii.pdf/view> Accessed March 2017.

31. CanMEDS. *Canadian medical education directions for CanMEDS. CanMEDS framework 2005*. Available at:http://www.royalcollege.ca/portal/page/portal/rc/common/documents/canmeds/resources/publications/framework_full_e.pdf. Accessed March 2017.
32. Tjin A Tsoi SLN, De Boer A, Koster AS. Gender differences in motivation and learning preferences of pharmacists in lifelong learning. *J Pharm Pharmacol*. 2014;2:608–615.
33. Mottram DR. Pharmacists' engagement in continuing education and attitudes towards continuing professional development. *Pharm J*. 2002;269(7221):618-22.
34. Laaksonen R. Overcoming barriers to engagement in continuing professional development in community pharmacy: A longitudinal study. *Pharm J*. 2009;282(7535):44-48.
35. Marriott J. Barriers to pharmacist participation in continuing education in Australia. *Pharm Educ*. 2007;7(1):11-17.
36. Bell HM. Perceptions of continuing professional development within the pharmacy profession. *J Soc Adm Pharm*. 2002;19(3):87-98.
37. Driesen A. Flemish community pharmacists' motivation and views related to continuing education. *Pharm World Sci*. 2005;27(6):447-452.
38. Hanson AL. Pharmacists' perceptions of facilitators and barriers to lifelong learning. *Am J Pharm Educ*. 2007;71(4).
39. Power A. Scottish pharmacists' views and attitudes towards continuing professional development. *Pharm World Sci*. 2008;30(1):136-43.
40. Deci, EL, Ryan, RM. *Handbook of self-determination research*. University Rochester Press; 2002.
41. Vansteenkiste M, Simons J, Lens W, Sheldon KM, Deci EL. Motivating learning, performance, and persistence: the synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *J Pers Soc Psychol*. 2004;87(2): 246.
42. Kusurkar RA, Croiset G, Mann KV, Custers E, Ten Cate O. Have motivation theories guided the development and reform of medical education curricula? A review of the literature. *Acad Med*. 2012;87(6):735-743.
43. Deci EL, Ryan RM. Facilitating optimal motivation and psychological well-being across life's domains. *Can Psychol/Psychol Can*. 2008;49(1):14.

44. Guay F, Ratelle CF, Chanal J. Optimal learning in optimal contexts: The role of self-determination in education. *Can Psychol/Psychol Can.* 2008;49(3):233.
45. Abassi M, Dargahi Sh. Role of Procrastination, Self-Regulation and Metacognition in Predicting Students' Academic Motivation. *Educ Strateg Med Sci.* 2014;7(5):273-278.
46. Vallerand RJ. Toward a hierarchical model of intrinsic and extrinsic motivation. *Adv Exp Soc Psychol.* 1997;29:271-360.
47. Chen B, Vansteenkiste M, Beyers W, et al. Basic psychological need satisfaction, need frustration, and need strength across four cultures. *Motiv Emot.* 2015;39(2):216-236.



CHAPTER 2

Unraveling Motivational Profiles of Healthcare Professionals for Continuing Education: the Example of Pharmacists in the Netherlands

Published in Journal of Continuing Education in the Health Professions

2016 Volume 36 Number 1 p. 46-54

Sharon L. N. Tjin A Tsoi
Anthonius de Boer
Gerda Croiset
Andries S. Koster
Rashmi A. Kusurkar

ABSTRACT

Introduction Continuing education (CE) can support healthcare 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 in 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.

INTRODUCTION

The current changes in patient care demand modification in healthcare services.¹⁻³ To meet this demand, all healthcare 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 (Figure 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 (i.e. from external factors) and is additionally characterized by four qualities of regulation: *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.

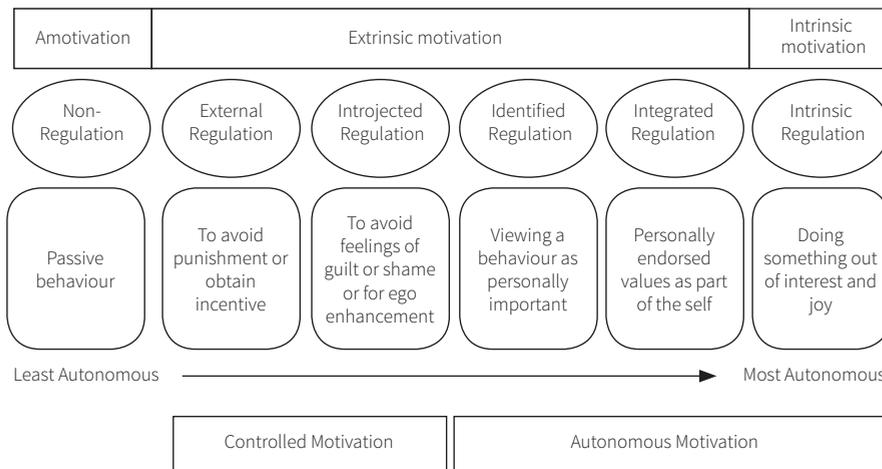


Figure 1. The Self-Determination Theory Continuum adapted from Ryan & Deci¹¹ and van den Broeck et al¹²

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 (e.g. feeling of choice), a need for competence (e.g. meeting preset standards), and a need for relatedness (e.g. recognizing role models and peers). This means that the quality of motivation for education depends on an educational environment (e.g. 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 and have shown they are associated with important educational outcomes (e.g. 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 in 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.

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. 2013 | Year 1-6 medical students | Intrinsic Motivation (IM) Controlled Motivation (CM) | <ul style="list-style-type: none"> High Intrinsic-High Controlled (HIHC) Low Intrinsic- Low Controlled (LILC) Low Intrinsic-High Controlled (LIHC) High Intrinsic-Low Controlled (HILC) | <p>HIHC - desirable learning profile, high surface strategy</p> <p>LILC and LIHC - least desirable learning behavior</p> <p>HILC - good study hours, deep study strategy, good academic performance and less exhaustion</p> |
| Vansteenkiste et al. 2009 | <p>Study 1: secondary school (high school) students</p> <p>Study 2: college students</p> | <p>Autonomous Motivation (AM)</p> <p>Controlled Motivation (CM)</p> | <p>Study 1 and 2:</p> <ul style="list-style-type: none"> Good quality: high AM, low CM High quantity: high AM, high CM Poor quality: low AM, high CM Low quantity: low AM, low CM | <p>Good quality - most optimal learning pattern, highest score on perceived need-supportive teaching</p> <p>High quantity - not better in academic functioning, higher levels on test anxiety</p> <p>Poor quality - no improved learning vs Low quantity, higher on procrastination and test anxiety, lower on effort regulation vs low quantity</p> <p><i>General conclusion: findings favored qualitative perspective compared with the other groups</i></p> |

| Study Reference | Research Population | Variables Used | Motivational Profiles Revealed | Educational Outcomes |
|---------------------|--|---|---|---|
| Ratelle et al. 2007 | Study 1 and 2: high school students Study 3: college students | Autonomous Motivation (AM) Controlled Motivation (CM) Amotivation | Study 1 and 2: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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 vs 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 |

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.

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 in CE. Given that the AMS is based on SDT and has demonstrated high reliability (Cronbach's alphas from 0.77 to 0.90),²⁵ we determined that it was the most

suitable instrument for our target group and the study purpose.

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. Cronbach’s alphas were 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's alphas 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 non-owners. 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

Table 2. Mean Scores of Pharmacists on Autonomous Motivation (AM), Controlled Motivation (CM), and Amotivation

| Characteristic | Number of Respondents | | Mean AM (SD) | Mean CM (SD) | Mean Amotivation (SD) |
|---|-----------------------|------|--------------|--------------|-----------------------|
| | n | % | | | |
| 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<0.001 | 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<0.001 | p<0.001 |
| 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<0.001 | p<0.001 | n.s. |
| Work experience (n=420) | | | | | |
| <10 years | 260 | 61.2 | 3.44 (0.50) | 2.24 (0.75) | 1.55 (0.62) |
| >10 years | 160 | 37.6 | 3.13(0.60) | 1.73 (0.63) | 1.36 (0.66) |
| | | | p<0.001 | p<0.001 | p=0.004 |
| 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=0.010 | p<0.001 | p=0.038 |

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

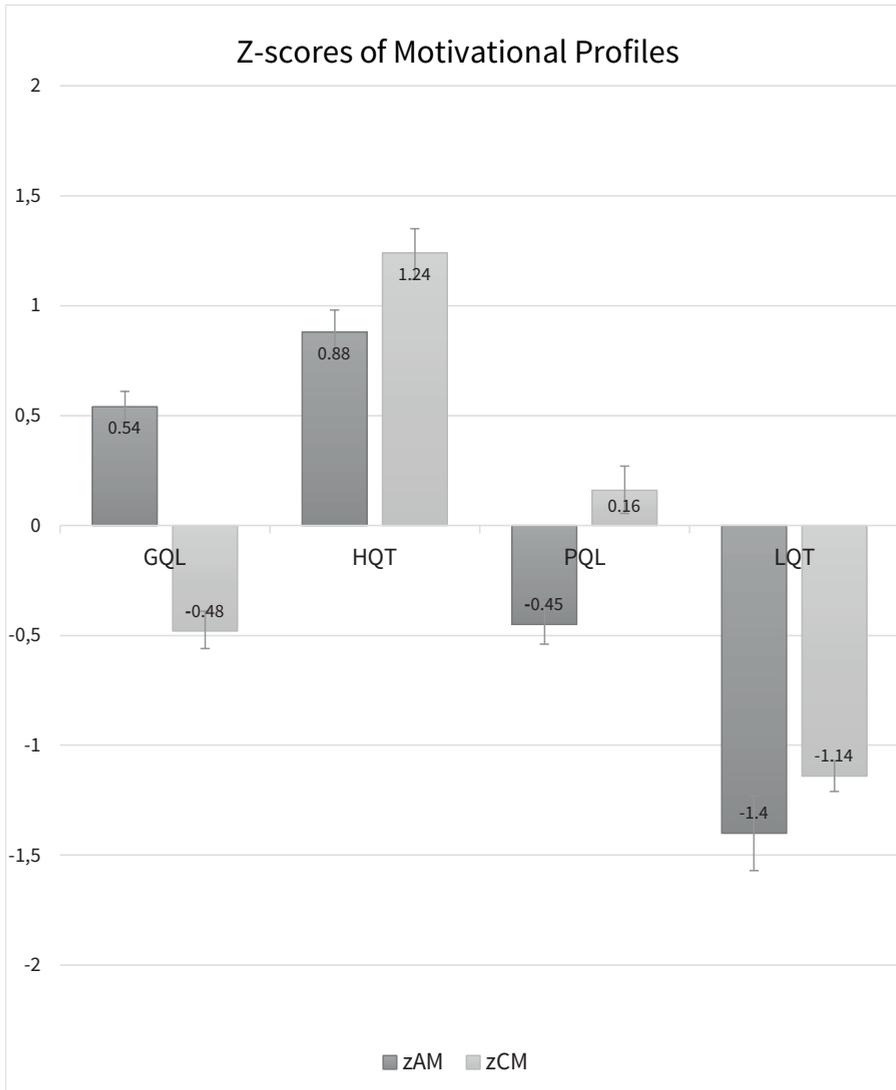


Figure 2. Motivational Profiles using Z-scores of variables Autonomous Motivation (AM) and Controlled Motivation (CM) with 95% confidence limits. Profiles: Good Quality (GQL), High Quality (HQT), Poor Quality (PQL), Low Quality (LQT)

Table 3. Mean Scores on Autonomous Motivation (AM) and Controlled Motivation (CM) and Amotivation of the Different Profiles

| | GQL, n=135 | HQT, n=114 | PQL, n=97 | LQT, n=79 | | % of Variance Explained |
|--------------------|--------------------------|----------------------------|--------------------------|--------------------------|----------|--------------------------------|
| | Mean (SD) | Mean (SD) | Mean (SD) | Mean (SD) | F | |
| 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 Means with the Different Subscripts (a,b,c,d) differ Significantly from each other. * $p < 0.001$. GQL indicates good quality; HQT, high quantity; LQT, low quantity; PQL, poor quality.

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 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.

Table 4. Characteristics of the Four Pharmacist's Profiles

| | GQL | | HQT | | PQL | | LQT | | Chi- square |
|---|-----|------|-----|------|-----|------|-----|------|--------------------|
| | n | % | n | % | n | % | n | % | |
| Gender (n=392) | | | | | | | | | |
| Female | 87 | 35.5 | 72 | 29.4 | 53 | 21.6 | 33 | 13.5 | 12.3 (df=3.388) |
| Male | 40 | 27.2 | 31 | 21.1 | 39 | 26.5 | 37 | 25.2 | p=0.006 |
| Current practice setting (n=413) | | | | | | | | | |
| Community pharmacy | 50 | 22.7 | 76 | 34.5 | 56 | 25.5 | 38 | 17.3 | 23.8 (df=3.409) |
| Hospital pharmacy | 82 | 42.5 | 36 | 18.7 | 38 | 19.7 | 37 | 19.2 | p<0.001 |
| Owner (n=399) | | | | | | | | | |
| Yes | 12 | 27.3 | 3 | 6.8 | 13 | 29.5 | 16 | 36.4 | 18.1 (df=3.395) |
| No | 113 | 31.8 | 107 | 30.1 | 79 | 22.3 | 56 | 15.8 | p<0.001 |
| Working experience (n=420) | | | | | | | | | |
| <10 years | 76 | 29.2 | 94 | 36.1 | 59 | 22.7 | 31 | 11.9 | 39.8 (df=3.388) |
| >10 years | 55 | 34.4 | 19 | 11.9 | 38 | 23.8 | 48 | 30.0 | p<0.001 |
| In training (n=403) | | | | | | | | | |
| Yes | 37 | 31.4 | 44 | 37.3 | 26 | 22.0 | 11 | 9.3 | 17.5 (df=3.399) |
| No | 94 | 33.0 | 59 | 20.7 | 66 | 23.2 | 66 | 23.2 | p=0.001 |

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

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 in CE. We found females to 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 literature²⁷ 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.

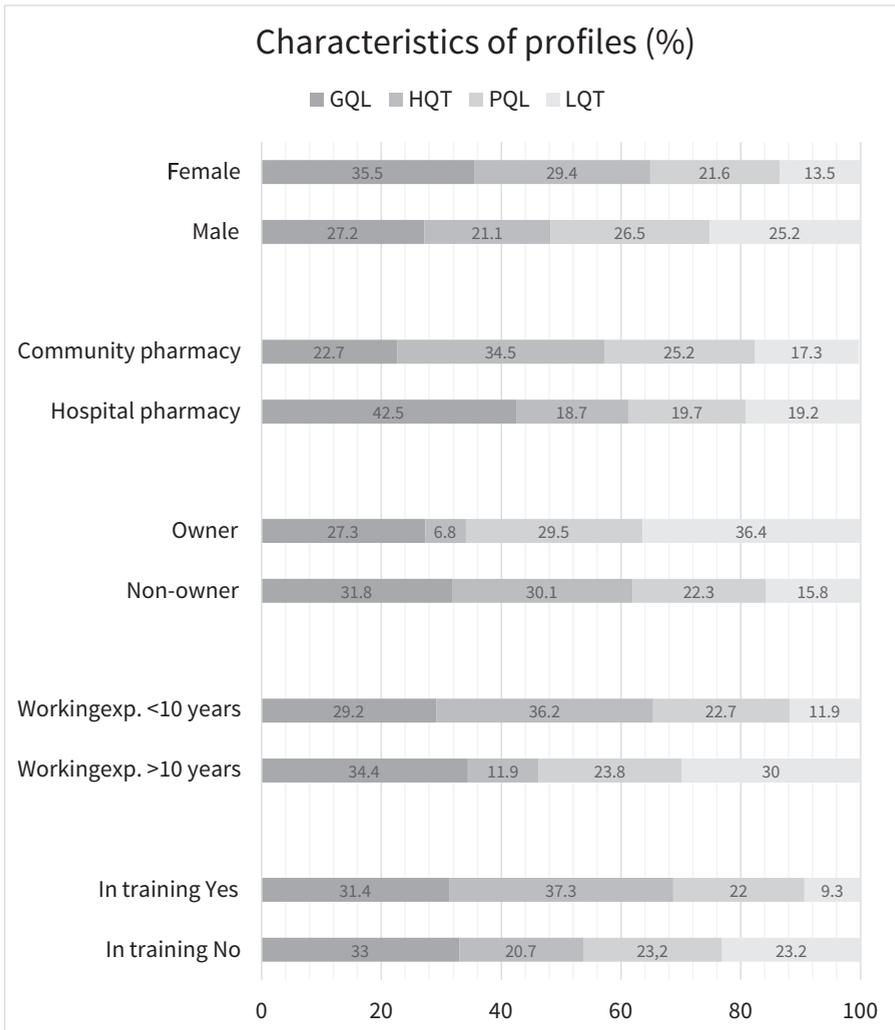


Figure 3. Characteristics of the Motivational Profiles: Good Quality (GQL), High Quantity (HQT), Poor Quality (PQL), Low Quantity (LQT). % Male vs % Female, % “Pharmacists working in a community pharmacy” vs % “Pharmacist working in a hospital pharmacy”, % “Owners” vs % “Nonowners”, % “Pharmacists working for less than 10 years” vs % “Pharmacists working for more than 10 years” and % “Pharmacists in training” vs % “Pharmacists not in training” per profile

The explanation could be that they work in an environment that stimulates and challenges their knowledge and competencies in a different (e.g. 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 (i.e. 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 in CE; 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 healthcare professionals. Therefore, we cannot support the objection of Tassone and Heck to an obligatory CE system for healthcare 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 (e.g. feeling of choice) and perceived competence (e.g. feeling of mastering certain knowledge and skills), could lead to educational approaches that stimulate and foster GQL motivation. For example, a menu “à 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, e.g. 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 healthcare 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 healthcare 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 in 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.

Acknowledgements

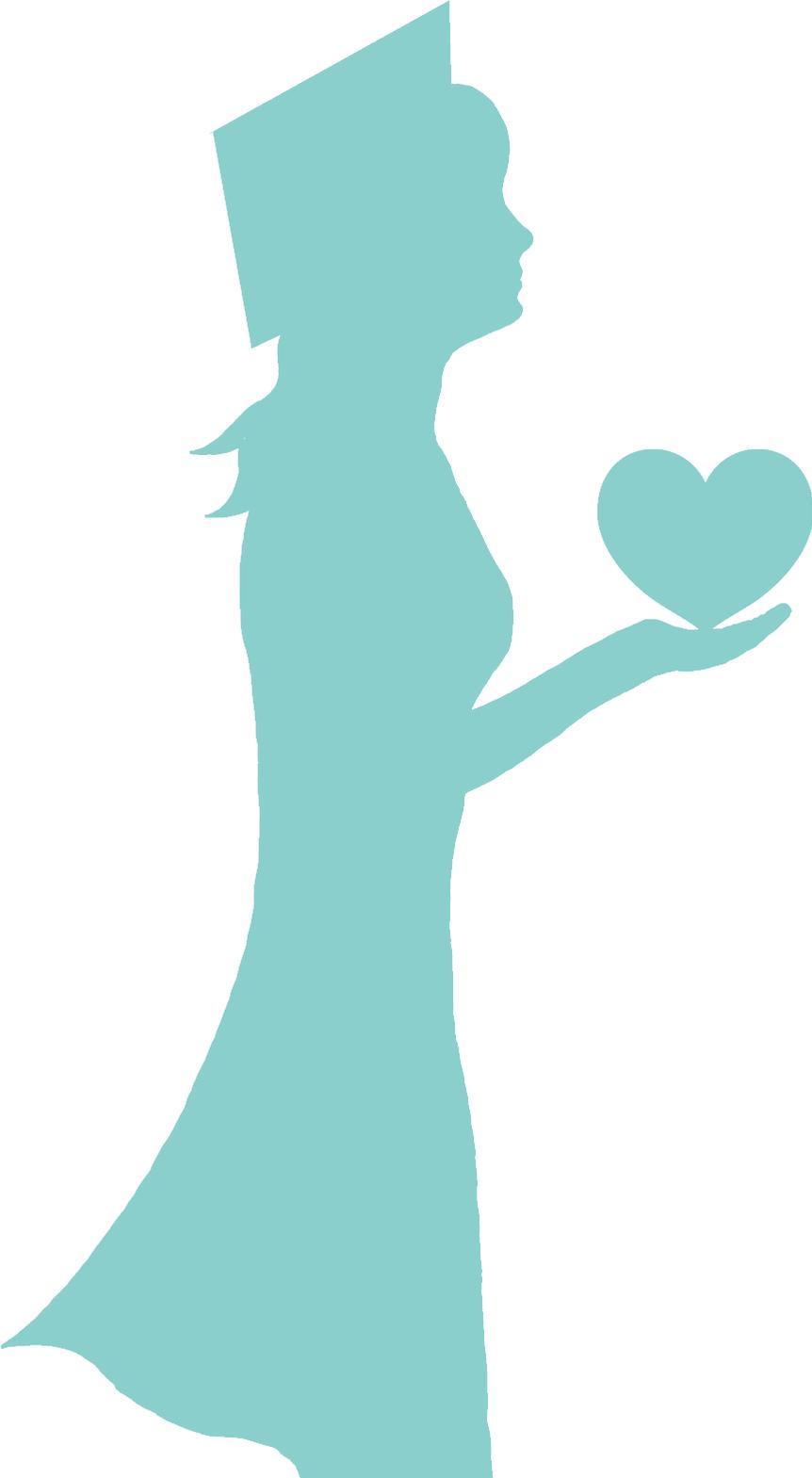
The authors acknowledge their students and coworkers, Sandra Korsten, Simone van den Bosch, Rebecca Muller, and Rutchana Jongejan, who helped to collect the data. The authors also thank Francisca Galindo-Garré, PhD, a statistician in the Department of Biostatistics, VUmc Amsterdam, for helping out with the clusteranalysis.

REFERENCES

1. WHO. *World Health Report 2013*. Available at: http://www.who.int/whr/2013/main_messages/en/. Accessed November 2013.
2. Hernandez SE, Conrad DA, Marcus-Smith MS, et al. Patient-centered innovation in health care organizations: a conceptual framework and casestudy application. *Health Care Manage Rev*. 2013;38:166–175.
3. Hastings JK, West DS, Hong SH. Changes in pharmacy student motivation during progression through the curriculum. *Am J Pharm Educ*. 2005;69:251–255.
4. Marriott J, Duncan GJ, McNamara KP. Barriers to pharmacist participation in continuing education in Australia. *Pharm Educ*. 2007;7:11–17.
5. Laaksonen R, Duggan C, Bates I. Overcoming barriers to engagement in continuing professional development in community pharmacy: a longitudinal study. *Pharm J*. 2009;282:44–48.
6. Driesen A, Leemans L, Baert H, et al. Flemish community pharmacists' motivation and views related to continuing education. *Pharm World Sci*. 2005;27:447–452.
7. Hanson AL, Bruskiwitz RH, DeMuth JE. Pharmacist' perceptions of facilitators and barriers to lifelong learning. *Am J Pharm Educ*. 2007;71:1–9.
8. Williams GC, Saizow RB, Ryan RM. The importance of self-determination theory for medical education. *Acad Med*. 1999;74:992–995.
9. 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.
10. 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.
11. Ryan MR, Deci EL. Overview of self-determination theory: an organismic dialectical perspective. In: *Handbook of Self-determination Research*. Rochester, NY: University of Rochester Press; 2004:3–33.
12. Van den Broeck A, Vansteenkiste M, De Witte H, et al. The selfdetermination theory: good quality motivation at the workplace [in Dutch]. *Gedrag Organisatie*. 2009;22:316–335.

13. 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.
14. Williams G. Improving health through supporting the autonomy of patients and providers. In: *Handbook of Self-Determination Research*. Rochester, NY: University of Rochester Press; 2004:233–254.
15. 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.
16. 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.
17. 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.
18. KNMP. *Specialisten Registratie commissie-openbare Farmacie*. 2014. Available at: <http://www.knmp.nl/downloads/UitvoeringsreglementHerregistratieregelingOpenbareFarmaciejuni2014.pdf>. Accessed September 2014.
19. CanMEDS. *Canadian Medical Education Directions for CanMEDS*. Ottawa, Canada: The Royal College of Physicians and Surgeons of Canada; 2005. Available at: http://www.royalcollege.ca/portal/page/portal/rc/common/documents/canmeds/resources/publications/framework_full_e.pdf. Accessed September 2014.
20. FIP. *FIPed Global Education Report 2013*. Available at: <https://fip.org/static/fipededucation/2013/2013GlobalEducationReport/index.html#/35>. Accessed September 2014.
21. Zimmerman BJ, Schunk DH. *Self-Regulated Learning: From Teaching to Self-Reflective Practice*. New York, NY: Guilford Publications; 1998:1–19.
22. SFK. Foundation for Pharmaceutical Statistics. Available at: <https://www.sfk.nl/nieuws-publicaties/PW/2015/steeds-meer-apothekers-wordenfranchisenemers>. Accessed February 2015.
23. NVZA. Dutch Association for Hospital Pharmacists. Available at: <http://www.nvza.nl/>. Accessed September 2014.

24. Vallerand RJ, Pelletier LG, Blais MR, et al. The academic motivation scale: a measure of intrinsic, extrinsic, and amotivation in education. *Educ Psychol Meas.* 1992;52:1003–1017.
25. Fairchild AJ, Horst SJ, Finney SJ, Barron KE. Evaluating existing and new validity evidence for the academic motivation scale. *Contemp Educ Psychol.* 2005;30:331–358.
26. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine.* 2000; 25:3186–3191.
27. Severiens SE, Ten Dam GTM. Gender differences in learning styles: a narrative review and quantitative meta-analysis. *High Educ.* 1994;27: 487–501.
28. Dobson RT, Perepelkin J. Pharmacy ownership in Canada: implications for the authority and autonomy of community pharmacy managers. *Res Soc Admin Pharm.* 2011;7:347–358.
29. Völkening U, Ostermann H, Link L, et al. The impact of selfdetermination on academic motivation of occupational therapists and physiotherapists in continuing higher education in Germany. *J Cont High Educ.* 2010;58:85–98.
30. Moran CM, Diefendorff JM, Kim T, et al. A profile approach to selfdetermination theory motivations at work. *J Vocat Behav.* 2012;85: 354–363.
31. Tassone MR, Heck CS. Motivational orientations of allied health care professionals participating in continuing education. *J Cont Educ Health Prof.* 1997;17:97–105.
32. Tjin A Tsoi SLN, De Boer A, Koster AS. Gender differences in motivation and learning preferences of pharmacists in lifelong learning. *J Pharm Pharmacol.* 2014;2:608–615.
33. Mc Namara KP, Duncan GJ, McDoowell J, et al. Community pharmacists' preferences for continuing education delivery in Australia. *J Cont Educ Health Prof.* 2009;29:52–57.
34. Kusurkar RA, Croiset G, Ten Cate OTJ. Twelve tips to stimulate intrinsic motivation in students through autonomy-supportive classroom teaching derived from self-determination theory. *Med Teach.* 2011;33:978–982.



CHAPTER 3

Factors Influencing Participation in Continuing Professional Development: a Focus on Motivation among Pharmacists

Published in Journal of Continuing Education in the Health Professions

2016 Volume 36 Number 3 p.144-150

Sharon L. N. Tjin A Tsoi
Anthonius de Boer
Gerda Croiset
Andries S. Koster
Rashmi A. Kusurkar

ABSTRACT

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.

INTRODUCTION

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 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 al⁶ and Power et al¹³ 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; non-preapproved activities are not.

Study participants/Recruitment

The sampling frame for this study was 831 registered community, hospital, outpatient, and other pharmacists partici-

pating 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

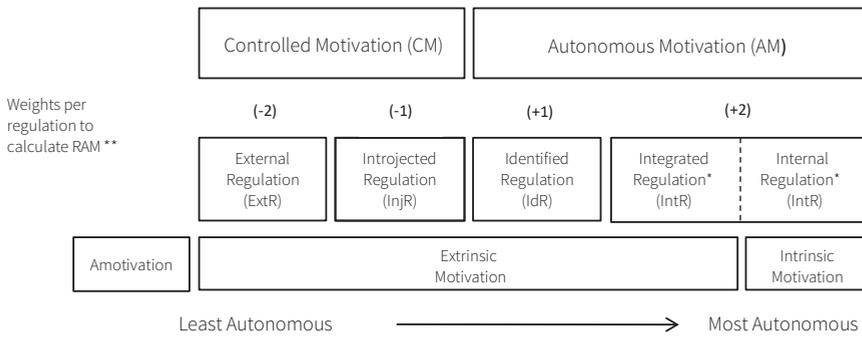
Self-Determination theory (SDT)¹⁹ has been used in medical and pharmacy education to study motivation.^{16,20} This theory describes motivation as a continuum (Figure 1) that ranges from Amotivation (supremely left) to Intrinsic Motivation (supremely right).

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.



*Integrated and Internal Regulation share the same quality in practice, therefore these two types of regulations are measured together.

**Relative Autonomous Motivation (RAM) = -2x ExtR + -1xInjR + 1x IdR + 2 x IntR

Figure 1. The Self-Determination Continuum with the Main Types of Motivation: Autonomous Motivation (AM) and Controlled Motivation (CM) and Relative Autonomous Motivation (RAM) adapted from Deci and Ryan¹⁵

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 guidelines³¹ 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 non-preapproved 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 (e.g. 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. Means (and Standard Deviation) Hours per Type 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 |

Table 3. Multiple Regression Model Explaining Participation in Continuing Education

| Predictor Variable | B ± SE (hours) | β | p | sr (% variance) | Effect Size | Observed Power |
|---|----------------|--------|------|-----------------|-------------|----------------|
| Constant | 16.7 ± 7.4 | | 0.03 | | | |
| study location (dummy = 1: Utrecht, 0: other) | - 7.8 ± 3.8 | - 0.20 | 0.04 | - 0.26 (6.8) | 0.15 | 0.87 |
| work experience (dummy = 1: >10 years, 0: < 10 years) | 9.3 ± 4.2 | 0.25 | 0.03 | 0.28 (7.8) | 0.05 | 0.43 |
| traineeship (dummy = 1: in training, 0: not in training) | - 14.4 ± 5.3 | - 0.31 | 0.01 | - 0.33 (10.9) | 0.19 | 0.84 |
| Relative Autonomous Motivation (RAM) (continuous) | 2.2 ± 1.0 | 0.23 | 0.03 | 0.28 (7.8) | 0.14 | 0.85 |

B, unstandardized regression coefficient (\pm 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 $R^2 = 0.39$, $F_{4,61} = 11.21$, $p < 0.001$, 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.

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, $p<0.05$ and -0.476, $p<0.01$, respectively). RAM was positively related to CE hours (0.399, $p<0.01$).

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 in 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 “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.

Table 4. Questions and Results (Including Quotes of the Interviewees) of the Semi-structured 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 (e.g. 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 in CE lifelong?

A future system according to the 8 interviewees should have the following characteristics:

- a) Slides and schemes of the followed courses should be kept accessible for the participants
- b) A system is needed which helps you find the course you desire and to store information about the courses you have already participated in
- c) Blended learning, interactivity, and multidisciplinary nature were mentioned as important facilitators for the future courses
- d) 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."

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 (e.g. 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 (e.g. 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 basic 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?

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 CanMEDS⁵ 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 in 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.

Acknowledgements

The authors thank Sandra Korsten and Simone van den Bosch, who helped to collect the data.

REFERENCES

1. *The Review of International CPD Models Report of the Pharmaceutical Society of Ireland (PSI)*. Dublin, Ireland: Pharmaceutical Society of Ireland; July 2010.
2. FIP. *FIPed Global Education Report 2013*. Available at: <https://fip.org/static/fipededucation/2013/2013-FIPedGlobalEducationReport/index.html#/35>. Accessed October 2015.
3. Zimmerman BJ, Schunk DH. *Self-Regulated Learning: From Teaching to Self-Reflective Practice*. New York, NY: Guilford Publications; 1998:1–19.
4. KNMP. *Specialisten Registratie commissie-openbare Farmacie 1 juni 2014*. 2014. Available at: http://www.knmp.nl/downloads/UitvoeringsreglementHerregistratieregeling_OpenbareFarmaciejuni2014.pdf Accessed October 2015.
5. CanMEDS. *Canadian medical education directions for CanMEDS*. 2005 CanMEDS framework. 2005. Available at: http://www.royalcollege.ca/portal/page/portal/rc/common/documents/canmeds/resources/publications/framework_full_e.pdf. Accessed October 2015.
6. Mottram DR, Rowe P, Gangani N, et al. Pharmacists' engagement in continuing education and attitudes towards continuing professional development. *Pharm J*. 2000;269:618–622.
7. Hull H, Rutter P. A cross-sectional survey of UK community pharmacists' views on continuing education and continuing professional development. *Int J Pharm Educ*. 2003;1:12.
8. Austin Z, Marini A, Glover NM, et al. Continuous professional development: a qualitative study of pharmacists' attitudes, behaviors, and preferences in Ontario, Canada. *Am J Pharm Educ*. 2005;69:25.
9. Driesen A, Leemans L, Baert H, et al. Flemish community pharmacists' motivation and views related to continuing education. *Pharm World Sci*. 2005;27:447–452.
10. Simoens S, Laekeman G. Continuing education programs for pharmacists: no one size fits all. *Pharm Educ*. 2008;8:37–43.
11. Hanson AL, Bruskiwitz RH, DeMuth JE. Pharmacists' perceptions of facilitators and barriers to lifelong learning. *Am J Pharm Educ*. 2007;71:67.

12. Namara KPM, Duncan GJ, McDowell J, et al. Community pharmacists' preferences for continuing education delivery in Australia. *J Contin Educ Health Prof.* 2009;29:52–57.
13. Power A, Johnson BJ, Diack HL, et al. Scottish pharmacists' views and attitudes towards continuing professional development. *Pharm World Sci.* 2008;30:136–143.
14. Donyai P, Herbert RZ, Denicolo PM, et al. British pharmacy professionals' beliefs and participation in continuing professional development: a review of the literature. *Int J Pharm Pract.* 2011;19:290–317.
15. Tjin A Tsoi SLN, De Boer A, Koster AS. Gender differences in motivation and learning preferences of pharmacists in lifelong learning. *J Pharm Pharmacol.* 2014;2:608–615.
16. Tjin A Tsoi SLN, De Boer A, Croiset G, Kusurkar RA. Unraveling motivational profiles of pharmacists regarding continuous education. *J Contin Educ Health Prof.* 2016;36:46–54.
17. SFK. *Foundation for pharmaceutical statistics.* Available at: <https://www.sfk.nl/nieuws-publicaties/PW/2015/steeds-meer-apothekers-worden-franchisenemers>. Accessed October 2015.
18. NVZA. *Dutch Association for Hospital Pharmacists.* Available at: <http://www.nvza.nl/> Accessed July 2015.
19. Deci EL, Ryan RM. *Handbook of Self-Determination Research.* Rochester, NY: University Rochester Press; 2002.
20. 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:e242–e262.
21. Vansteenkiste M, Simons J, Lens W, et al. Motivating learning, performance, and persistence: the synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *J Pers Soc Psychol.* 2004;87:246–260.
22. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol.* 2000;55:68–78.
23. Kusurkar RA, Ten Cate TJ, Vos CMP, et al. How motivation affects academic performance: a structural equation modelling analysis. *Adv Health Sci Educ Theory Pract.* 2013;18:57–69.

24. 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.
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.
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;13:87.
27. Vallerand RJ, Pelletier LG, Blais MR, et al. The academic motivation scale: a measure of intrinsic, extrinsic, and amotivation in education. *Educ Psychol Meas.* 1992;52:1003–1017.
28. Fairchild AJ, Horst SJ, Finney SJ, et al. Evaluating existing and new validity evidence for the Academic Motivation Scale. *Contemp Educ Psychol.* 2005;30:331–358.
29. Ryan RM, Connell JP. Perceived locus of causality and internalization: examining reasons for acting in two domains. *J Pers Soc Psychol.* 1989; 57:749–761.
30. Guay F, Geneviève AM, Vallerand RJ. On the hierarchical structure of self-determined motivation: a test of top-down, bottom-up, reciprocal, and horizontal effects. *Pers Soc Psychol Bull.* 2003;29:992–1004.
31. Beaton DE, Bombardier C, Guillemin F, et al. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine (Phila Pa 1976).* 2000;25:3186–3191.
32. Faul F, Erdfelder E, Buchner A, et al. Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behav Res Methods.* 2009;41:1149–1160.
33. Kusurkar RA, Croiset G, Ten Cate OTJ. Twelve tips to stimulate intrinsic motivation in students through autonomy-supportive classroom teaching derived from self-determination theory. *Med Teach.* 2011;33:978–982.



CHAPTER 4

Exploring Changes in the Motivation of Dutch Pharmacists with respect to the Current Continuing Education System: a Longitudinal Approach

Accepted in the American Journal of Pharmaceutical Education

March 2017

Sharon L. N. Tjin A Tsoi

Anthonius de Boer

Gerda Croiset

Rashmi A. Kusrkar

Andries S. Koster

ABSTRACT

Introduction Pharmacists' motivation to pursue Continuing Education (CE) and Continuing Professional Development (CPD) plays a pivotal role in the quality of learning outcomes and patient care. Understanding the dynamics of their motivation and what influences them could enable us to design a CE/CPD system that fosters the right type of motivation in CE and CPD.

Methods Pharmacists' motivation was measured across three time points with the Academic Motivation Scale, based on the Self-Determination Theory of motivation. The Latent Growth Modelling technique was used to analyze these data.

Results Over a period of 21 months (undesirable) Controlled Motivation had increased and (desirable) Relative Autonomous Motivation of Dutch pharmacists had decreased. Traineeship was the only demographic factor with a significant influence on the change in motivation. No subgroups with different trajectories could be identified.

Discussion The motivation of Dutch pharmacists for CE changes over time. Further research needs to be conducted to gain a better understanding of the association between pharmacist motivation and the features of the current CE system.

INTRODUCTION

After graduation, pharmacists and other healthcare professionals must maintain and develop their knowledge and competencies by engaging in lifelong learning. Historically, research and improvements in the *teaching-learning environment* of higher education have been focused mainly on the training of healthcare professionals before they start their professional career and not on postgraduate or continuing education. Therefore, not much is known about learning outcomes and the quality of models, approaches and lifelong learning systems for the healthcare workforce.¹

Continuing Education (CE) and Continuing Professional Development (CPD) are ways for healthcare professionals to pursue lifelong learning. CE involves structured learning activities like conferences, workshops or e-learning modules. CE is mainly knowledge- and competency-based. CPD is defined as an ongoing structured cycle of learning wherein self-directed learning skills are crucial for success.²⁻⁴ CE is often included in the cyclical CPD process.

With the establishment of *The International Forum for Quality Assurance of Pharmacy Education* in 2001, the quality assurance and promotion of excellence in pharmacy education for undergraduates has received international attention.⁵ A global Quality Assurance Framework for Pharmacy Education was adopted to stimulate the development and training of quality pharmacists to face the critical shortages of the pharmacy workforce.⁵ It was not until 2014 that the International Pharmaceutical Federation (FIP) presented a report emphasizing the need for lifelong learning through CE/CPD and the intent to create stronger policies and programs for lifelong learning in Pharmacy.⁶ International case studies demonstrate substantial differences in CE/CPD requirements for pharmacists within and across countries.⁶⁻⁸ Only 31 countries have require-

ments to maintain registration and 11 countries have formal systems like competency frameworks for advanced practice to monitor the quality of CE activities. Consequently, knowledge about the characteristics of an effective CE/CPD model is lacking. An important finding of the published case studies was that an annual CE/CPD credit requirement can support pharmacists' CE/CPD participation, but some pharmacists are motivated by the number of credits rather than the relevance of the learning activity for practice.⁶

Earlier studies of pharmacists' participation in and attitudes CE/CPD also emphasize motivation both as a facilitator and a barrier.⁸⁻¹² Moreover, motivation was found to be a positive predictor for pharmacists' participation in CE.¹³ Studies grounded in the Self-Determination Theory (SDT) of motivation emphasize the importance of motivation in learning.¹³⁻¹⁷ Therefore pharmacists' motivation in CE/CPD participation should be taken into account when planning and designing a CE/CPD model that is meant to stimulate conceptual understanding, persistence and good professional performance.^{15,16}

Motivation can function as either an independent or dependent variable: independent when it influences learning outcomes, dependent when it is influenced by factors in the learning environment, like teaching methods, teacher skills and curricula.^{18,19} Longitudinal studies conducted in high schools, colleges and universities report fluctuations in student motivation across time in response to classroom activities and during a transitional academic year.²⁰⁻²² Although motivation is known to be dynamic, is susceptible to learning environment influences, and influences educational outcomes, research on motivation as a dependent variable is limited.^{19,23-25}

To our knowledge this is the first study that investigates pharmacists' motivation in CE as a dependent variable across

time. We aim to explore the changes in pharmacists' motivation in CE in the Dutch CE system. Our research questions were: does pharmacists' motivation in CE change over time, how do these changes occur and what demographic factors influence these changes?

METHOD

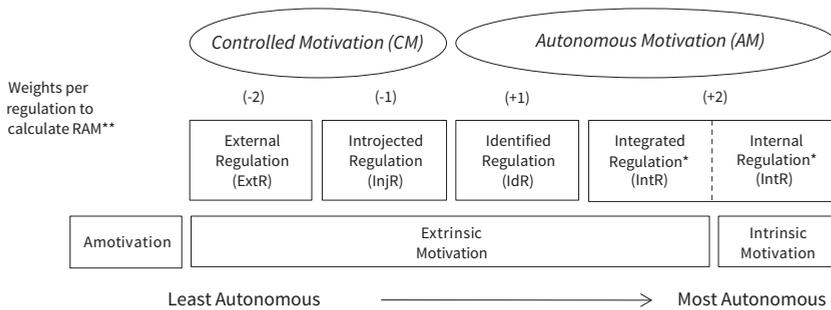
Setting

Historically, pharmacy education has been provided in four universities (Amsterdam, Leiden, Groningen, Utrecht) in the Netherlands. Dutch pharmacists have participated in CE activities since 1995. Accredited CE activities like lectures, e-learning sessions, workshops and peer sessions are provided by different types of (commercial) organizations, including pharmaceutical companies. In 2001, the Netherlands Centre for Post-Academic Education in Pharmacy was founded by the universities as an independent body that organizes training courses for hospital, industrial and community pharmacists and offers a broad range of independent, accredited CE activities.

The ability to renew a practice license was introduced for hospital pharmacists in 2009 and community pharmacists in 2012.^{26,27} Both hospital and community pharmacists are required to participate in 200 hours of accredited CE activities and work for at least 16 hours/week in practice for five consecutive years. Since January 2015, community pharmacists are required to participate in a total of 200 accredited CE hours/year, of which 190 hours must come from predetermined CanMEDs competencies such as collaboration and communication.²⁸ The remaining 10 hours must come from reflective CE methods like learning through peer review and submission of case reports. The (mandatory) current CE system in the Netherlands is expected to stimulate CE participation at the expense of the right type of motivation.

Theoretical Background

SDT distinguishes two types of motivation: 1) autonomous motivation (AM) and 2) controlled motivation (CM).^{13,14,18,19} AM is determined from different types of regulations that are generated from within an individual and are called *intrinsic* (activity done out of genuine interest), *integrated* (activity backed by a person’s own beliefs) and *identified* regulation (consciously valuing an activity). CM is determined from regulations that are generated from external factors and are called *introjected* (activity not fully accepted as one’s own and originating from internal pressure) and *external* regulation (activity carried out because of external demands or for rewards).¹⁴ These regulations are placed on a continuum (Figure 1) wherein intrinsic motivation is the most autonomous type of motivation and external is the least, with the other states in between.¹⁴



*Integrated and Internal Regulation share the same quality in practice, therefore these two types of regulations are measured together.

**Relative Autonomous Motivation (RAM) = -2x ExtR + -1xInjR + 1x IdR + 2 x IntR.

Figure 1. The Self-Determination Continuum from Deci and Ryan with the Main types of Motivation: Autonomous Motivation (AM) and Controlled Motivation (CM) and Relative Autonomous Motivation (RAM)

AM is associated with better learning outcomes and positive well-being, unlike CM, which is associated with poor academic

performance and burnout.¹⁴⁻¹⁷ Hence, AM is more desirable than CM. SDT demonstrates that satisfying three basic psychological needs: 1) autonomy (experiencing volition), 2) perceived competence (feeling capable of mastering a task) and 3) relatedness (connecting with peers) can contribute to AM. Thwarting these needs results in AM changing to CM. Autonomy-supportive teaching style refers to coordinating learning activities with learners' preferences and sense of competence and avoiding external regulators such as incentives and deadlines. Small group teaching and problem-based learning are examples of student-centered education which in principle incorporate an autonomy-supportive educational style. They encourage the active participation of learners and shift the responsibility for learning to the learners themselves. Autonomy-supportive teaching has been reported to produce optimal learning outcomes.²⁹⁻³¹

Therefore, an effective CE/CPD model requires pharmacists to have self-regulation skills and to spend time and effort in continuing to update their knowledge.^{3,4} As motivation seems to affect all stages of self-regulated learning, an effective CE/CPD model needs to stimulate and foster the AM of pharmacists. AM and CM measure the independent effects of the two primary types of motivation of SDT. We needed a single variable that represents the overall self-determined motivation in a person. Hence we used the relative autonomy index/relative autonomous motivation (RAI/RAM). In the rest of the article we will refer to RAI/RAM as RAM. RAM indicates how AM and CM are related to each other within an individual by combining and weighing the autonomous regulations positively and the controlled regulations negatively. The use of RAM has been validated in several studies.^{13,15-17}

In the Netherlands, the learning environment of pharmacists can be characterized as a mandatory quantity-based (number

of credits) CE system. Moreover, a trend is observed wherein financial incentives are provided by health insurance companies and the government in order to stimulate pharmacists' participation in CE. According to SDT these extrinsic rewards in the current CE system are likely to increase CM. We hypothesize that pharmacists' controlled motivation (CM) will increase and therefore relative autonomous motivation (RAM) will decrease across time in the current CE system because RAM will be undermined by extrinsic rewards.

In earlier studies we have found that different motivational profiles are associated with differences in gender distribution, type of pharmacy school, number of years of work experience, and being or not being a trainee. These demographic factors seem to play a role in CE participation.^{13,32} We, therefore, wanted to explore if these demographic variables could also predict how pharmacists' RAM develops over time.

Study Design

We conducted a prospective longitudinal study with Dutch pharmacists. Pharmacists were invited to join this study while they were participating in face-to-face CE activities. These CE activities were organized by the "Netherlands Centre for Post-Academic Education in Pharmacy". The participating pharmacists completed a paper-based questionnaire between September 2013 and January 2014 (T0) and signed an informed consent form which gave us permission to approach them for further research. We approached the participants to complete the same questionnaire electronically after nine months (T1: between June and September 2014) and 21 months (T2: between July and September 2015). Four reminders were sent.

Instrument and Variables used

Pharmacists' motivation in CE was measured with the Academic

Motivation Scale (AMS).³³ The AMS is based on SDT and has been used in different contexts like secondary schools, universities and medical schools.³⁴ For the current study, we translated and constructed a Dutch version of the AMS, following the steps specified by the adaptation guidelines for questionnaires.³⁵ We validated the AMS by conducting factor analysis on T0 scores and computing the reliabilities of all the subscales.

Pharmacists could score the statements on a five-point Likert scale (1-strongly disagree and 5-strongly agree. With these scores we calculated Autonomous Motivation (AM = the average of Intrinsic Motivation and Identified Regulation), Controlled Motivation (CM = the average of Introjected Regulation and External Regulation) and Relative Autonomous Motivation (RAM = (Intrinsic Motivation x 2) + (Identified Regulation x 1) + (Introjected Regulation x -1) + (External Regulation x -2)).^{15,16} We also collected demographic details like gender, working environment, pharmacy school and work experience.

Data Analyses

For the statistical analyses we used SPSS version 23. The MCAR (Missing Completely At Random) test was used to determine to what extent the missing items were a random subset of the data. Data were imputed with an average of the three items/factor when the fourth was missing.

Mplus version 7.4 was used to perform Latent Growth Modelling and Latent Class Growth Analysis.^{36,37} Latent Growth Modelling is a technique that makes it possible to describe changes over time, using individual developmental trajectories in longitudinal growth curves.^{36,37} Latent Class Growth Modelling is said to be the most suitable method for capturing *inter-individual* differences in *intra-individual* change after accounting for any unobserved heterogeneity within a larger population.³⁷

Longitudinal development is measured as the slope function (represented as “s”) and assumes a linear trend during the measurement period (in our case 1.75 years). The basal variable value (represented as intercept or “i”) is assumed to have the same value at T0, T1 and T2.^{36,37} To determine the fit of our model, we used the following model fit indices with the specified criteria: Chi-square test (p-value > 0.05), Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) (both < 0.08), Comparative Fit Index (CFI) and Tucker Lewis Index (TLI) (both > 0.9).^{38,39}

Latent Class Growth Analysis was used to explore if, sub-groups (e.g. based on demographics) could be formed based on differences in individual growth trajectories. To do this we tested models with 4, 3 and 2 classes with Lo-Rubin Adjusted Test (LRT).^{36,37}

Ethical Approval

Ethical approval was obtained from the Ethical Review Board of the Netherlands Association for Medical Education (NVMO) - (file 262).

RESULTS

The response rates were 57.5% (n=432) at T0, 29.6% (n=128) at T1 and 24.8% (n=107) at T2. The MCAR test revealed random missing data (less than 1.1%) at T0. After imputing the missing data, 425 cases could be used at T0. The percentage of pharmacists who completed the questionnaire at all three time points was 16.7% (n=72). We decided not to impute missing data at T1 or T2 because the missing data consisted of completely missing questionnaires. Consequently we used a complete sample of 72 cases for analysis. This final sample demonstrates reasonable representativeness of the larger sample at T0 (See Table 1).

Table 1. Demographics of the Pharmacists who Participated in all three Questionnaires (complete cases; n=72) in comparison with the Pharmacists who completed the Questionnaire at T=0 (larger sample; n=425)

| Factor Variable | Complete Cases n (%) | Larger Sample n (%) |
|-------------------------|-----------------------------|----------------------------|
| Gender | | |
| Females | 50 (69.4) | 245 (57.6) |
| Males | 22 (30.6) | 147 (34.6) |
| Unknown | 0 | 33 (7.8) |
| Pharmacy school | | |
| Utrecht | 44 (61.1) | 220 (51.8) |
| Groningen | 22 (30.6) | 165 (38.8) |
| Other or unknown | 6 (8.4) | 41 (9.6) |
| Work environment | | |
| Community Pharmacy | 34 (47.2) | 220 (51.8) |
| Hospital Pharmacy | 33 (45.8) | 193 (45.4) |
| Other or unknown | 5 (7) | 12 (2.8) |
| Work experience | | |
| >10 years | 27 (37.5) | 160 (37.6) |
| <10 years | 44 (61.1) | 260 (61.2) |
| Unknown | 1 (1.6) | 5 (1.2) |
| Traineeship | | |
| Not in training | 47 (65.3) | 285 (67.0) |
| In training | 20 (27.8) | 118 (27.8) |
| Unknown | 5 (6.9) | 22 (5.2) |
| Employment | | |
| Owner | 5 (6.9) | 44 (10.4) |
| Employee | 62 (86.1) | 355 (83.5) |
| Unknown | 5 (6.9) | 26 (6.1) |

Latent Growth Modelling

AM and CM, as measured during the study period, both increased from 3.35 (± 0.55) and 1.87 (± 0.64) at T0 to 3.45 (± 0.65) and 2.23 (± 0.81) at T2, respectively (Table 2, upper part). The increase from T0 to T1 seemed larger than the increase from T1 to T2. RAM decreased from 4.33 (± 1.84) at T0 to 3.63 (± 1.92) at T2.

Table 2. Means and Standard Deviations of Autonomous Motivation (AM), Controlled Motivation (CM) and Relative Autonomous Motivation (RAM) at T0, T1 and T2*

| Variable | AM (SD) | CM (SD) | RAM (SD) |
|---------------------------------|----------------|---------------|----------------|
| Observed variable values | | | |
| T0 | 3.35 (0.55) | 1.87 (0.64) | 4.33 (1.84) |
| T1 | 3.46 (0.53) | 2.13 (0.64) | 3.79 (1.59) |
| T2 | 3.45 (0.65) | 2.23 (0.81) | 3.63 (1.92) |
| Modeled variable values | | | |
| Intercept (significance)** | 3.36 (p<0.001) | 1.89(p<0.001) | 4.20(p<0.001) |
| Slope (significance)** | 0.07 (p=0.029) | 0.20(p<0.001) | -0.38(p=0.002) |

*T0: collected from September 2013 to January 2014 (at 0 months), T1: collected from June 2014 to September 2014 (at 9 months), T2: collected from July 2015 to September 2015 (at 21 months).

** p<0.05 is significant.

We analyzed two different models using: 1) both AM and CM as dependent variables (to observe any possible independent effects of the two primary types of motivation within SDT) and 2) RAM as a dependent motivation variable. Slope variances were fixed to zero in both models. Fit indices for both model 1 and model 2 were good. Model 1 had the following indices: $\chi^2(df)=13.159$ (15), $p=0.358$; RMSEA=0.037; SRMR=0.120; CFI>0.995; TLI=0.994. Model 2 had the following indices: $\chi^2(df)=3.666$ (6),

$p=0.300$; $RMSEA=0.056$; $SRMR=0.041$; $CFI=0.990$; $TLI=0.990$. The modeled intercept for AM was 3.36 and for CM 1.89 (Table 2, lower part). These values represent the initial (model) value of the AM and CM scores at the beginning (T_0) of the developmental trajectory. The modeled intercept for RAM was 4.20. The modeled slope from T_0 to T_2 was 0.07 for AM, 0.20 for CM and 0.38 for RAM. AM increased from T_0 to T_2 by 0.07/year, CM increased by 0.20/year and RAM decreased by 0.38/year. The model diagram of model 1 is shown in Appendix 1.

Because we only had five pharmacy owners in our dataset, we decided to remove ownership versus pharmacy employees as a possible predictor. Consequently we tested gender, working environment, work experience, traineeship and pharmacy school as predictors for the development of pharmacists' RAM over time. Among the demographic factors, only traineeship had a statistically significant effect on the development of pharmacists' RAM over time. Table 3 shows the values of the different possible predictors and their effects on the pharmacists' RAM over time. Among the demographic factors, only traineeship significantly influenced the growth trajectory of RAM (intercept -1.22 with $p=0.02$; slope 0.85 with $p=0.01$).

Based on our earlier findings about motivational profiles (subgroups based on the combination of AM and CM within an individual), we wanted to explore if we could also find different groups with different growth patterns using Latent Class Growth Analysis. On the LRT, the model with 1 class showed the best fit, which means that no subgroups were found.

In conclusion, our results showed that pharmacists' RAM significantly decreased (slope -0.38 ; $p=0.002$), mostly because CM increased steeply (slope 0.20 ; $p<0.001$) over time in the current CE system. No statistically significant subgroups could be found based on differences in RAM development.

Table 3. Multiple Regression with Demographic Effects on the Initial Value and Growth of RAM

| Predictor Variable | Intercept | | | Slope | | |
|--|--------------|------|--------|--------------|------|------|
| | B ± SE | t | p | B ± SE | t | p |
| Constant | 3.97 ± 0.46 | 8.58 | <0.001 | -0.66 ± 0.29 | 2.28 | 0.02 |
| Traineeship (for the past 2 years) (label = 1: In training, 0: Not in training) | -1.22 ± 0.50 | 2.41 | 0.02 | 0.85 ± 0.32 | 2.67 | 0.01 |
| Gender (label = 1: Male, 0: Female) | -0.08 ± 0.47 | 0.16 | 0.87 | 0.22 ± 0.29 | 0.75 | 0.45 |
| City (label = 1: Utrecht, 0: Other) | 0.54 ± 0.46 | 1.18 | 0.24 | -0.28 ± 0.29 | 0.96 | 0.34 |
| Work experience (label = 1: >10 years, 0: < 10 years) | 0.24 ± 0.48 | 0.50 | 0.62 | 0.04 ± 0.30 | 0.14 | 0.89 |
| Working environment (label = 1: Hospital, 0: Community) | 0.46 ± 0.42 | 1.10 | 0.27 | -0.08 ± 0.26 | 0.29 | 0.77 |

B, unstandardized regression coefficient; SE, standard error of the regression coefficient; t, estimate-value divided by SE; p, statistical significance of the regression coefficient.

DISCUSSION

We found that the pharmacists' motivation in CE changes over a two-year period. Our hypothesis that the pharmacists' relative autonomous motivation (RAM) for CE would decrease over time was supported by our results. It is difficult to ascribe the decrease of RAM only to the characteristics of the mandatory credit-based Dutch CE system, because factors like a high workload, personality traits and life events could also influence motivation. The motivation of higher education students has been reported before to have changed from intrinsic to extrinsic. This is probably due to the teaching and learning environment and major transitions in lifestyles and relationships.²¹

The higher increase of AM and CM from T0 to T1 in comparison with the increase from T1 to T2 could be caused by a possible ceiling effect. This means that a maximum effect could have been reached at T2. Only traineeship had a statistically significant effect on the development of pharmacists' RAM over time. This effect is difficult to interpret because the status of pharmacists can change during the study from "the trainee" to "the trained". Of the pharmacists (n=20) who were in training at T0, we were able to reach 11 by email and phone. Six were still in training and five had finished their training before participating at T1 or T2.

In an earlier study, we found that pharmacists' RAM is associated with CE participation.¹³ A decrease in RAM could therefore be associated with a decrease in CE participation, which is expected to decrease lifelong learning in pharmacists. Therefore a likely consequence of the current CE system is that pharmacists may only engage in the minimal CE participation that is required to maintain their license.

Self-determined motivation like AM has been positively associated with enhanced psychological functioning and leads to positive educational outcomes like psychological adjustment, concentration and satisfaction with academic life.^{15,17} On the other hand, CM has been associated with burnout, a higher dropout rate and surface learning.^{15,17}

In 2014 and 2015, a quick scan about vitality and stress in the job was conducted among Dutch healthcare professionals (e.g. general practitioners, veterinarians and pharmacists).⁴¹ Learning and development was one of four important factors that influenced the motivation of the healthcare professionals. Pharmacists had the highest percentage of burnout (32.3% in 2014 and 25% in 2015) among all healthcare professionals.⁴¹ Burnout could be caused by the increased bureaucracy, like

administration of patient care and negotiating with health insurance companies. We think that the incentives (CE credits and financial rewards) of the current CE system could also play a role in producing burnout by undermining self-determined motivation in CE.

Globally, contemporary healthcare demands a highly functioning CE/CPD system for healthcare professionals in order to improve and maintain their competencies. Regardless of the system chosen by a country, the key components for an effective CE/CPD system remain clear regulations and an independent accreditation structure that monitors the CE/CPD system output. Our findings advocate an educational intervention in the current CE system of the pharmacists in the Netherlands. We suggest developing a CE/CPD system that focuses on fostering RAM instead of stimulating CM. For example, identifying the learning needs of the healthcare professionals and providing opportunities for charting personal learning journeys within the CE/CPD structure can help nurture the self-determined motivation of pharmacists.^{29-31,42}

Implications for Practice

Our findings imply that in the current CE system and in pharmacy practice, the self-determined motivation of pharmacists to participate in CE activities is decreasing. Because traditional CE does not seem to meet professional development needs adequately, a CPD approach is being implemented in a growing number of countries like Canada, Australia and the United Kingdom. Additional research is needed to develop an effective CPD system wherein the self-regulating skills of pharmacists and thus self-determined motivation is nurtured.

The stimulation and maintenance of self-determined motivation can be achieved through autonomy-supportive educational formats.^{29-31,42} Recently, five pillars (context, structure, process,

outcomes and impact) and three foundations (science, practice and ethics) of quality for CE in pharmacy were described.⁴³ Pharmacy regulators and CE providers were alarmed about the responsibility they would have to take in the engagement and the future of CE and CPD. Defining skills, competencies and conditions needed for self-directed, lifelong learning could help to fulfill their obligation. Based on SDT and our findings in this study, we would like to suggest using an autonomy-supportive educational approach to develop self-regulated lifelong learning. This can be achieved by fulfilling the three basic psychological needs of autonomy, competence and relatedness not only in the construction of a teaching-learning environment, but also in the design and appraisal of regulations for renewal of the license to practice.^{29-31,42}

We suggest that regulatory bodies assess CE courses not only on themes of knowledge and competencies, but also on the didactic structure and the autonomy-supportive attitude of the trainers.^{29-31,42} Moreover, they could review and audit outcomes of the CE activities according to the accreditation guidelines. These new assessment points would lead to a more uniform and structured CE system and an improvement in the quality of CE activities. These changes would make it possible to monitor the exact impact of the CE system on pharmaceutical care. In turn, CE providers could improve the didactic structures (e.g. connecting the learning activity to consistent guidelines and to the participant's personal goals) of the activities and train their trainers in autonomy-supportive teaching skills.^{29-31,42}

Recommendations for Future Research

The factors that play a role in the change of pharmacists' motivation in CE are not yet known. We recommend research on how pharmacists' motivation in CE is related with their work motivation, vitality and professional performance. Further

research is also required to determine if the current CE system is able to fulfill the basic psychological needs of pharmacists for CE, and if and how learning outcomes like professional performance and vitality are related.

Limitations

The study was conducted at a time when pharmacists in the Netherlands experienced a serious amount of pressure from increasing bureaucracy and decreasing budgets from the government and health insurance companies. This could have had a significant effect on raising the pharmacists' scores on CM. We studied the change of pharmacists' motivation for almost two years at three time points; however, a fourth time point and a period of five years would have given more information about the development of motivation across time. Short-term effects such as temporary time constraints and new regulations from policymakers could be corrected for by having data over a longer time span.

Although the response rates (T1: 29.6% and T2: 24.8%) were low, extrapolation of the findings to the larger group seems justifiable because of the demonstrated representativeness of the sample of 72 cases. Also these response rates seem acceptable for electronic surveys (around 20%).⁴⁰ Further longitudinal research with larger cohorts is recommended.

Since we used self-report questionnaires, we recommend further research with actual professional and learning outcomes recorded through performance management tools and objective assessments.

CONCLUSION

The motivation of Dutch pharmacists for CE changes over time in the current CE system. RAM decreased statistically significantly over a 21-month period because CM increased relatively steeply. Further research should be conducted to determine the exact role of the current CE system in these changes.

Acknowledgements

The authors thank Sandra Korsten and Simone van den Bosch, pharmacy students from Utrecht University who helped collect the data. A special thanks to Xynthia Kavelaars, student of Methodology and Statistics for the Behavioral, Biomedical, and Social Sciences Methods and Statistics at Utrecht University for helping with the *Latent Growth Model* and *Latent Class* analyses in Mplus.

REFERENCES

1. Tran D, Tofade T, Thakkar N & Rouse M. US and international health professions' requirements for continuing professional development. *Am J Pharm Educ.* 2014;78(6).
2. Sobral DT . What kind of motivation drives medical students' learning quests? *Med Educ.* 2004;38(9):950-957.
3. White CB, Gruppen LD & Fantone JC. Self-Regulated Learning in Medical Education. *Understanding medical education: Evidence, theory and practice.* 2010:201-211.
4. Rouse MJ. Continuing professional development in pharmacy. *J Pharm Technol.* 2004;20(5):303-306.
5. FIP. *International Pharmaceutical Federation. Quality Assurance of Pharmacy Education: the FIP Global Framework 2nd Ed.* 2014. Available at: https://www.fip.org/files/fip/PharmacyEducation/Quality_Assurance/QA_Framework_2nd_Edition_online_version.pdf Accessed March 2017.
6. FIP. International Pharmaceutical Federation. *Continuing Professional Development/Continuing Education in Pharmacy: Global report.* The Hague, Netherlands: International pharmaceutical Federation; 2014. Available at: https://www.fip.org/files/fip/PharmacyEducation/CPD_CE_report/FIP_2014_Global_Report_CPD_CE_online_version.pdf Accessed March 2017.
7. *The Review of International CPD Models* report of the *Pharmaceutical Society of Ireland (PSI).* July 2010.
8. Donyai P, Herbert RZ, Denicolo PM, Alexander AM. British pharmacy professionals' beliefs and participation in continuing professional development: a review of the literature. *Int J Pharm Pract.* 2011;19:290-317.
9. Austin Z, Marini A, Glover NM, Croteau D. Continuous professional development: a qualitative study of pharmacists' attitudes, behaviors, and preferences in Ontario, Canada. *Am J Pharm Educ.* 2005;69(1-5):25.
10. Driesen A, Leemans L, Baert H, Laekeman G. Flemish community pharmacists' motivation and views related to continuing education. *Pharm World Sci.* 2005;27:447-452.

11. Namara KPM, Duncan GJ, McDowell J, Marriott JL. Community pharmacists' preferences for continuing education delivery in Australia. *J Contin Educ Health Prof.* 2009;29:52–57.
12. Power A, Johnson BJ, Diack HL, McKellar S, Stewart D, Hudson SA. Scottish pharmacists' views and attitudes towards continuing professional development. *Pharm World Sci.* 2008;30:136–143.
13. Tjin A Tsoi SLN, De Boer A, Croiset G, Koster AS, Kusurkar, RA. Factors Influencing Participation in Continuing Professional Development: A Focus on Motivation among Pharmacists. *J Cont Educ Health Prof.* 2016;36(3):144-150.
14. Deci EL, Ryan RM. *Handbook of Self-Determination research.* University of Rochester Press. 2002.
15. Kusurkar RA, Ten Cate TJ, Vos CMP, Westers P, Croiset G. How motivation affects academic performance: a structural equation modelling analysis. *Adv Health Sci Educ.* 2013;18(1):57-69.
16. Vansteenkiste M, Zhou M, Lens W, Soenens B. Experiences of autonomy and control among Chinese learners: Vitalizing or immobilizing? *J Educ Psychol.* 2005;97(3):468.
17. Vallerand RJ, Fortier MS, Guay F. Self-determination and persistence in a real-life setting: Toward a motivational model of high school dropout. *J Pers Soc Psychol.* 1997;72:1161–1176.
18. Hustinx PW, Kuyper H, Van der Werf MP, Dijkstra P. Achievement motivation revisited: New longitudinal data to demonstrate its predictive power. *Educ Psychol.* 2009;29(5):561-582.
19. Kusurkar RA, Ten Cate TJ, Van Asperen M, Croiset G. Motivation as an independent and a dependent variable in medical education: a review of the literature. *Med Teach.* 2011;33(5):e242-e262.
20. Otis N, Grouzet FM, Pelletier LG. Latent Motivational Change in an Academic Setting: A 3-Year Longitudinal Study. *J Educ Psychol.* 2005;97(2):170.
21. Ostovar N, Mesrabadi J. Students' Motivational Profiles Changes in an Academic Setting: A Longitudinal Study. *Procedia Soc Behav Sci.* 2011;30:1018-1021.
22. Dillon A, Stolk J. The students are unstable! Cluster analysis of motivation and early implications for educational research and practice. *Frontiers Educ Conf Proceed.* 2012:1-6.

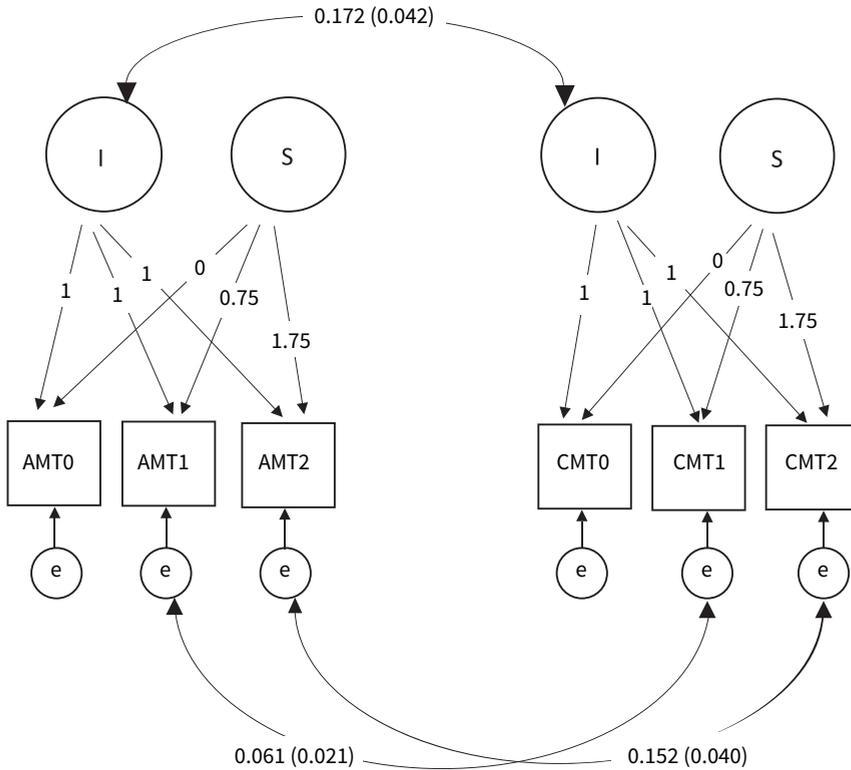
23. Vansteenkiste M, Sierens E, Soenens B, Luyckx K, Lens W. Motivational profiles from a self-determination perspective: The quality of motivation matters. *J Educ Psychol*. 2009;101(3):671-688.
24. Von Below B, Hellquist G, Rödger S, Gunnarsson R, Björkelund C, Wahlqvist M. Medical students' and facilitators' experiences of an Early Professional Contact course: Active and motivated students, strained facilitators. *BMC Med Educ*. 2008;8(1):1.
25. Cantillon P, Macdermott M. Does responsibility drive learning? Lessons from intern rotations in general practice. *Med Teach*. 2008;30(3):254-259.
26. KNMP. *Specialisten Registratie Commissie-Openbare Farmacie*. 2014. Available at: <http://www.knmp.nl/downloads/Uitvoeringsreglement-HerregistratieregelingOpenbareFarmaciejuni2014.pdf> Accessed March 2017.
27. NVZA. *Dutch Association for Hospital Pharmacists*. Available at: <http://www.nvza.nl> Accessed March 2017.
28. CanMEDS. *Canadian medical education directions for CanMEDS. 2005 CanMEDS framework*. 2005. Available at: <http://www.royalcollege.ca/portal/page/portal/rc/common/documents/canmeds/resources/publications/frameworkfulle.pdf> Accessed March 2017.
29. Reeve J. Teachers as facilitators: What autonomy-supportive teachers do and why their students benefit. *Elem Sch J*. 2006;106(3):225-236.
30. Kusurkar RA, Croiset G, Ten Cate OTJ. Twelve tips to stimulate intrinsic motivation in students through autonomy-supportive classroom teaching derived from self-determination theory. *Med Teach*. 2011;33(12):978-982.
31. Kusurkar RA, Croiset G. Autonomy support for autonomous motivation in medical education. *Med Educ Online*. 2015;20:27951.
32. Tjin A Tsoi SLN, De Boer A, Croiset G, Koster AS, Kusurkar RA. Unraveling Motivational Profiles of Health Care Professionals for Continuing Education: The Example of Pharmacists in the Netherlands. *J Cont Educ Health Prof*. 2016;36(1):46-54.
33. Vallerand RJ, Pelletier LG, Blais MR, Briere NM, Senecal C, Vallieres EF. The academic motivation scale: a measure of intrinsic, extrinsic, and amotivation in education. *Educ Psychol Meas*. 1992;52:1003-1017.

34. Fairchild AJ, Horst SJ, Finney SJ, Barron KE. Evaluating existing and new validity evidence for the Academic Motivation Scale. *Contemp Educ Psychol*. 2005;30:331–358.
35. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine (Phila Pa 1976)*. Survey response rates. *Public Opin Q*. 2000;25(24):3186–3191.
36. Duncan TE, Duncan SC. An introduction to latent growth curve modeling. *Behav Ther*. 2004;35(2):333–363.
37. Jung T, Wickrama KAS. An introduction to latent class growth analysis and growth mixture modeling. *Soc Personal Psychol Compass*. 2008;2(1):302–317.
38. Hooper D, Coughlan J, Mullen M. Structural equation modelling: Guidelines for determining model fit. *Articles*. 2008;2.
39. Schreiber JB, Nora A, Stage FK, Barlow EA, King J. Reporting structural equation modeling and confirmatory factor analysis results: A review. *J Educ Res*. 2006;99(6):323–338.
40. Kaplowitz MD, Hadlock TD, Levine R. A comparison of web and mail survey response rates. *Public Opin Q*. 2004;68(1):94–101.
41. Quickscan “Bezieling in de zorg” (2014) Available at: http://www.beroepseer.nl/images/stories/documenten/samenvatting_onderzoek_zorgprofessionals_vvaa_2014.pdf Accessed March 2017.
42. Tjin A Tsoi SLN, De Boer A, Croiset G, Koster AS, Kusurkar RA. Regaining passion in healthcare professionals by designing a motivating system for continuing education and continuing professional development. *In preparation*.
43. Meštrović A, Rouse MJ. Pillars and Foundations of quality for continuing education in pharmacy. *Am J Pharm Educ*. 2015;79(3).

APPENDIX

Appendix 1. Latent Growth Model Diagram of Pharmacists' Autonomous Motivation (AM) and Controlled Motivation (CM) (model 1) across three Time Points

MODEL 1



Legend: Model 1 AMT0, AMT1, AMT2 represent Autonomous Motivation on T0, T1 and T2, respectively and CMT0, CMT1, CMT2 represent Controlled Motivation on T0, T1 and T2, respectively. I and S represents Intercept (constant for the group at each time point, hence the fixed values are 1 for factor loadings on the repeated measures) and Slope (represents the development over time). Loadings on the slope factor represent the scales of time (0, 0.75, 1.75). Intercepts of AM and CM covary (0.172) with standard error 0.042. AMT1 and CMT1 covary (0.061) with standard error 0.021 and AMT2 and CMT2 covary (0.152) with standard error 0.040. "e" refers to the error variances.



CHAPTER 5

How Basic Psychological Needs and Motivation affect Vitality and Lifelong Learning Adaptability of Pharmacists: a Structural Equation Model

Under Review at Advances in Health Sciences Education

March 2017

Sharon L. N. Tjin A Tsoi
Anthonius de Boer
Gerda Croiset
Andries S. Koster
Stéphanie van der Burgt
Rashmi A. Kusurkar, MD, PhD

ABSTRACT

Introduction An important cause of poor performance of healthcare professionals is a lack of professional development. Therefore, continuing education (CE) and continuing professional development (CPD) are needed to secure safe and good quality healthcare. The aim of the study was to investigate the hypothesized associations between pharmacists' basic psychological needs in CE, their academic motivation, well-being, learning outcomes and the directions of the associations.

Methods Self-Determination Theory (SDT) was used as a theoretical framework for this study. Data were collected through four questionnaires measuring: academic motivation (AMS), basic psychological needs (BPN), vitality and lifelong learning adaptability of pharmacists in the CE/CPD learning context. Structural Equation Modelling (SEM) was used to analyze the data.

Results Demographic factors like gender and working environment influenced the observed scores for frustration of BPN and factors like training status and working experience influenced the observed scores for academic motivation. Support for the structural relationship of the hypothesized model (based on SDT) could not be found. However, a good model fit could be found for a part of the hypothesized pathway. Frustration of BPN is positively directly related to (the less desirable) controlled motivation (0.88) and negatively directly related to vitality (-1.61) and negatively indirectly related to learning outcomes in CE.

Discussion Basic Psychological Needs are important predictors for well-being and learning outcomes. Further research should be conducted to discover how we can prevent these needs from being frustrated in order to design a motivating, vitalizing and sustainable CE/CPD system for pharmacists and other healthcare professionals.

INTRODUCTION

Poor performance of healthcare professionals characterized by e.g. medication errors is often caused by poor professional development. Therefore, continuing education (CE) and continuing professional development (CPD) in healthcare workers have been identified as essential to secure safe and good quality healthcare.¹⁻³ Furthermore, rapidly changing trends in patient care demand that they maintain and update their knowledge, skills and competencies and intend to change their behavior.⁴⁻⁸

Studies have reported a ‘lack of motivation’ as one of the main barriers for healthcare professionals to participate in CE/CPD or change their behavior.⁹⁻¹⁰ Moreover, healthcare professionals’ motivation in general is also heavily challenged because of increasing bureaucratic demands and regulations from regulatory bodies like governments and insurance companies.¹¹⁻¹³ Nevertheless, research on motivation in relation to professional development and performance of healthcare professionals is limited. Motivation has been frequently studied in various life domains and especially in education.¹⁴⁻¹⁷ Most of these studies in the education domain were conducted in structured settings such as high schools and universities and emphasize the relation between motivation and learning outcomes like study strategies, study performance and students’ well-being.¹⁸⁻²⁰

On the contrary, motivation and learning outcomes in work-based learning environments that are less well-structured have been scarcely studied. Because motivation plays a pivotal role in job satisfaction, energy and the professional performance of healthcare professionals, we were interested in studying their motivation in CE and CPD and its effect on their well-being and learning outcomes using the Self-Determination Theory¹⁶ as the theoretical framework.

Self-Determination Theory (SDT)

SDT¹⁶ has a multidimensional view on motivation that assesses both the level and quality of motivation. Three major categories of motivation are distinguished. The first category, *intrinsic motivation*, refers to engaging in an activity just out of interest. The second category, *extrinsic motivation*, refers to executing an activity for external reasons such as avoiding criticism, receiving (financial) rewards or ego-enhancement. The third category, *amotivation*, refers to the absence of motivation for an activity. Extrinsic motivation is further divided into 3 subtypes depending on the state of internalization. Internalization refers to the integration of values, initially regulated by external factors, that later become internally regulated. The first (non-internalized) form of extrinsic motivation is *external regulation* which refers to doing an activity to obtain rewards or avoid punishments. The next form is *introjected regulation* (semi-internalized), which refers to acting out of internal pressures like shame or guilt. Lastly, *identified regulation* (most internalized) refers to acting because one identifies with the value of the activity and accepts it as her own.

External and introjected regulations are frequently merged to depict controlled motivation (CM) and identified regulation and intrinsic motivation are merged to depict autonomous motivation (AM).^{18,20} AM has been found to be associated with well-being and learning outcomes like deep learning and academic success.^{20,21} CM has been found to be associated with outcomes like burnout, procrastination and surface learning.^{9,21,22} Relative Autonomous Motivation (RAM) is used to express AM relative to CM in an individual.^{23,24} A higher score on RAM means a relatively high AM score compared to the CM score and vice versa.

Basic Psychological Needs Theory (BPNT)

BPNT is one of the six constituent theories of SDT^{16,25} and considers the importance of three basic psychological needs (BPN): 1) *autonomy*, 2) *relatedness* and 3) *perceived competence*. Fulfilling these needs is essential for human thriving, as opposed to thwarting them which can result in maladjustment and even psychopathology.^{26,27} BPNT claims universality across cultures and countries which means that satisfaction of the BPN is an essential nutrient for optimal functioning of human beings irrespective of cultural and individual differences.^{28,29}

Fulfilling the need of autonomy refers to the experience of sovereignty and feeling of choice while carrying out an activity. Frustration of autonomy would involve feeling controlled due to external pressures. Fulfilling the need of relatedness refers to the experience of belonging and connection to others, while frustrating the need of relatedness refers to feeling lonely and excluded. Finally, fulfilling the need of competence refers to feeling effective and capable of achieving desired outcomes, whereas frustrating the need of competence refers to feelings of failure. Satisfying these needs seems to be related with well-being and frustrating these needs with ill-being. Moreover, it is expected that satisfying the needs of autonomy, relatedness and competence would be positively related to AM and frustrating them would be positively related to CM.^{26,28,30}

Motivation in Pharmacists

Pharmacists' motivation in CE has been previously studied using SDT as a theoretical framework.^{31,32} Based on the quality of their motivation in CE four different profiles seemed to emerge in pharmacists: 1) good quality (high AM and low CM), 2) high quantity (high AM and high CM), 3) poor quality (low AM and high CM) and 4) low quantity (low AM and low

CM).³¹ In addition, motivation seemed to play a role in their CE participation, as well as other factors such as pharmacy school, traineeship and work experience.³² A longitudinal study executed with the same sample showed that RAM decreased over a 21-month period.³³ It is difficult to pinpoint these changes solely to the CE system that the pharmacists participated in because contemporary pharmacy practice is also influenced by increased external pressures from governments and societies.¹³ Both community and hospital pharmacists have had to adjust to numerous changes in the Netherlands in the last decade. For instance insurance companies have started dictating the drug distribution and therefore changing drug governance, and a transition from traditional drug-related care to patient care has occurred. Consequently, new knowledge and different skills are being demanded from pharmacists. In addition, community pharmacists were recently (2016) acknowledged as specialists just like general practitioners (1973) and hospital pharmacists (1998). Together with the findings of earlier studies about pharmacists' motivation in CE, this study could be used to assess the current CE system for pharmacists in the Netherlands and investigate possible strengths and weaknesses of the current CE system regarding pharmacists' motivation. Moreover, this time frame creates an excellent opportunity to redesign a CE/CPD system geared to stimulate AM and prevent the increase of CM.

Well-being and Learning Outcomes through the Fulfillment of BPN and Motivation

In light of the increasing percentage (approximately 30%) of burnout (ill-being) in Dutch pharmacists,¹³ it has become urgent to re-energize this group. Well-being has been measured in earlier studies with subjective vitality as an indicator and represents the “brighter” side of human existence.^{26,34} Subjective vitality is defined as a positive feeling of having available energy from the self.³⁴ Ill-being/burnout, on the other

hand, refers to the “darker” side.²⁶ According to SDT, tools for re-energizing pharmacists can be discovered by understanding the effects of BPN and motivation in CE/CPD in relation to well-being and learning outcomes.

To our knowledge there is no earlier study that has elaborated on these relations in the learning context (CE/CPD system) of healthcare professionals. The objective of the present study is to investigate a complete route (consisting of an upper “bright” and a lower “dark” side) from predictors to outcome with the possible associations between pharmacists’ BPN in CE, their academic motivation, well-being and learning outcomes.

Hypotheses

We constructed the following hypotheses on the basis of the literature, and expect a model for this study as suggested in Figure 1.

Hypothesis 1: Satisfying BPN is associated with an increase in AM (directly), an increase in well-being (directly and indirectly through AM) and an improvement in learning outcomes (directly and indirectly).

Hypothesis 2: Frustrating BPN is associated with a decrease in AM (directly), increase in CM (directly), decrease in well-being (directly and indirectly through Academic Motivation) and decrease in learning outcomes (directly and indirectly).

Hypothesis 3: An increase in AM is associated with an increase in well-being (directly) and learning outcomes (directly and indirectly).

Hypothesis 4: An increase in CM is associated with a decrease in well-being (directly) and learning outcomes (directly and indirectly).

Hypothesis 5: An increase in well-being is directly associated with an increase in learning outcomes.

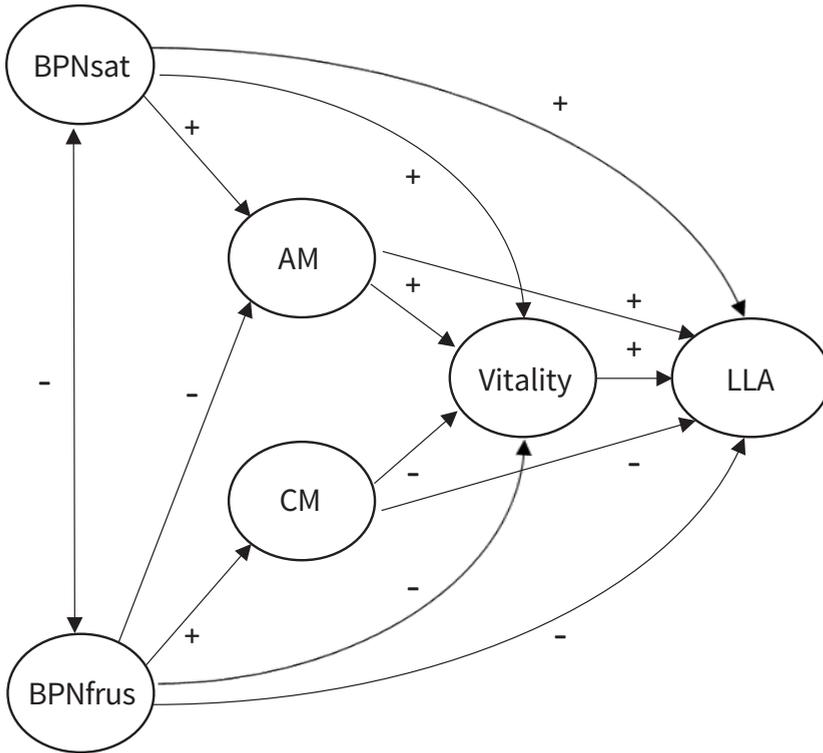


Figure 1. Hypothesized Model of a Pathway from Basic Psychological Needs to Learning Outcomes

METHODS

Setting

This study was conducted among 425 Dutch pharmacists working in a community and hospital pharmacy that participated in CE courses organized by the Netherlands Centre for Post-Academic Education in Pharmacy. Pharmacists were invited to fill out four questionnaires administered by email from June 2015 to September 2015.

Measures

The original instruments, which were constructed in English, were modified according to the adaptation guidelines for questionnaires³⁵ to fit the CE context and translated to Dutch. Next, the translated questionnaires were assessed by a group of 5 experts in the field consisting of pharmacists and educators in pharmacy. The feedback given by the pharmacists and educators, mostly about terminology, was processed in the final questionnaires.

Academic Motivation

The Academic Motivation Scale (AMS) a 7-factor 28-item scale³⁶ was used to assess academic motivation. The different dimensions of academic motivation like identified and external regulation were measured by items such as “because I believe CE will improve my competencies as a professional” and “to prove to myself that I am capable of succeeding in CE”, respectively. Responses were scored on a five-point scale from 1, representing “totally disagree” to 5, representing “totally agree”.

Basic Psychological Need (BPN) satisfaction and frustration

To assess Basic Psychological Need satisfaction (BPNsat) and frustration (BPNfrus) of the pharmacists in the context of CE, we used a 6-factor 24-item scale that was validated across four cultures.²⁹ The stem was: “We would like to measure your feelings and experiences about CE in general”. Need satisfaction and need frustration items were both categorized by autonomy, competence and relatedness. For example, “I feel I have been doing what really interests me” (autonomy satisfaction), “I feel insecure about my abilities” (competence frustration) and “I experience a warm feeling with the people I spend time with” (relatedness satisfaction). Responses were scored on a five-point scale from 1, representing “totally disagree” to 5, representing “totally agree”.

Vitality

Because vitality is an important indicator of well-being we used the 7-item subjective Vitality Scale from Ryan & Frederick 1997.³⁴ We used only one of the two levels measured by this questionnaire, wherein the scores indicate the degree to which the statement represents the general vitality. Statements like “I feel alive and vital” and “I have energy and spirit” were scored on a seven-item scale: 1 representing “not at all true” and 7 representing “very true”.

Lifelong Learning and Adaptability (LLA)

Owing to the context of our study, we used only one of the four domains, namely Lifelong Learning and Adaptability (LLA), from the Professionalism Assessment Tool with a total of eight items.³⁷ Topics proposed were: e.g. “Recognizing limitations and seeking help” and “Please score your overall level of performance in Lifelong Learning and Adaptability”.

Responses were rated according to Miller’s performance level on a five-point scale: 1) knows (I understand these responsibilities, but may perform one or more inconsistently, at times), 2) knows how (I understand these responsibilities and perform them in a reliable, consistent and accountable manner), 3) shows (Without prompting or support from instructors, preceptors or managers, I determine when and how to engage in these responsibilities), 4) shows how (I am confident in assisting others with these responsibilities or proposing or creating options to fulfill these responsibilities and 5) teaches how (I have mastered these responsibilities and desire to learn more and share my learning with others. I demonstrate maturity, confidence and an ability to educate others in these areas through the use of evidence and strong interpersonal skills).

Statistical analyses

For the descriptive statistics and primary analyses we used SPSS version 23. A Structural Equation Modelling (SEM) approach was performed in R (version 1.0.136) Lavaan package using Maximum Likelihood by default. The reliability of the measurements with the questionnaires was tested by calculating their Cronbach's alphas. The SEM model fit criteria used were: Root Mean Square Error of Approximation (RMSEA) of < 0.05 , Standardized Root Mean Square Residual (SRMR) of max 0.08, Comparative Fit Index (CFI) of > 0.90 , Tucker-Lewis Index (TLI) of > 0.90 .³⁸⁻⁴⁰

Ethical Approval

Anonymity was ensured and informed consent was obtained from all participants. Ethical approval was granted by the Dutch Medical Education association (NVMO): folder 262 and amendment 497.

RESULTS

One hundred nine pharmacists completed the four questionnaires which resulted in a response rate of 26%.

Primary Analyses

For every questionnaire, as well as each subscale, Cronbach's alphas were calculated. With a range from 0.73-0.90 the reliabilities of the scales were acceptable.^{41,42}

Descriptive Statistics and Correlations among the Study Variables

In Table 1 the mean scores on the different variables in relation to the demographics are reported. Only in the categories of working

Table 1. Means (M) and Standard Deviations (SD) of the Variables Autonomous Motivation (AM), Controlled Motivation (CM), Basic Need satisfaction (BPNsat) and Basic Need frustration (BPNfrus), Vitality and Lifelong Learning and Adaptability (LLA)

| | N | AM | CM | BPNsat | BPNfrus | Vitality | LLA |
|----------------------------|----|------------|-------------|-------------|-------------|-------------|-----------|
| Gender | | | | | | | |
| Male | 38 | 3.37 ±0.63 | 2.17 ±0.80 | 3.96 ± 0.67 | 1.75 ± 0.53 | 5.21 ±1.14 | 2.97±0.74 |
| Female | 71 | 3.50 ±0.60 | 2.30 ±0.79 | 3.69 ± 0.44 | 2.00 ± 0.56 | 4.64 ±1.09 | 2.97±0.74 |
| | | n.s. | n.s. | p=0.019 | p=0.038 | p=0.018 | n.s. |
| Working Environment | | | | | | | |
| Community Pharmacy | 50 | 3.43 ±0.55 | 2.40 ±0.79 | 3.67 ± 0.60 | 2.03 ± 0.59 | 4.71 ±1.13 | 2.90±0.77 |
| Hospital Pharmacy | 51 | 3.54 ±0.69 | 2.16 ±0.79 | 3.84 ± 0.47 | 1.86 ± 0.51 | 4.91 ±1.14 | 3.04±0.77 |
| Other | 8 | | | | | | |
| | | n.s. | n.s. | n.s. | p=0.035 | n.s. | n.s. |
| In Training | | | | | | | |
| Yes | 33 | 3.61 ±0.62 | 2.50 ±0.74 | 3.67 ± 0.42 | 1.97 ± 0.45 | 4.95 ±1.09 | 3.09±0.62 |
| No | 72 | 3.40 ±0.60 | 2.17 ±0.79 | 3.83 ± 0.59 | 1.90 ± 0.60 | 4.82 ±1.11 | 2.95±0.82 |
| Other/ unknown | 4 | | | | | | |
| | | n.s. | p=0.035 | n.s. | n.s. | n.s. | n.s. |
| Working Experience | | | | | | | |
| <10yr | 65 | 3.58 ±0.55 | 2.45 ±0.76 | 3.78 ± 0.46 | 1.98 ± 0.57 | 4.86 ±1.12 | 2.96±0.64 |
| >10yr | 36 | 3.23 ±0.68 | 1.96 ±0.74 | 3.76 ± 0.68 | 1.81 ± 0.55 | 4.87 ± 1.07 | 3.02±0.96 |
| Other/ unknown | 8 | | | | | | |
| | | p=0.006 | p=0.002 | n.s. | n.s. | n.s. | n.s. |
| City of training | | | | | | | |
| Utrecht | 57 | 3.49 ±0.64 | 2.22 ±0.79 | 3.83 ± 0.47 | 1.86 ± 0.50 | 4.88 ±1.06 | 3.03±0.68 |
| Groningen | 37 | 3.44 ±0.57 | 2.33 ± 0.81 | 3.72 ± 0.57 | 1.92 ± 0.53 | 4.94 ±1.10 | 2.95±0.83 |
| Other/ unknown | 9 | | | | | | |
| | | n.s. | n.s. | n.s. | n.s. | n.s. | n.s. |

experience and training status did we observe statistical significant differences in mean scores on motivation (AM and CM). For example, *pharmacists with working experience of 10 years or less* scored higher on CM (M=2.45, SD=0.76) than *pharmacists with working experience of 10 years and higher* (M=1.96, SD=0.74). Statistically significant differences in mean scores on BPNfrus and BPNsat were observed in relation to the categories of gender and working environment. For example, females on an average had lower levels of satisfaction of basic needs (M=3.69, SD=0.44) than males (M=3.96, SD=0.67) and *pharmacists working in a community pharmacy* scored higher on frustration of BPN (M=2.03, SD=0.59) than *pharmacists working in a hospital pharmacy* (M=1.86, SD=0.51). Furthermore, gender also showed a statistically significant difference in the mean score on vitality. For example, females on average had lower levels of vitality (M=4.64, SD=1.09) than males (M=5.21, SD=1.14). No statistically significant difference was seen in the mean scores on LLA in relation to demographic categories.

Table 2. Pearson’s Correlation of the Study Variables Basic Psychological Need Satisfaction (BPNsat), Basic Psychological Need Frustration (BPNfrus), Autonomous Motivation (AM), Controlled Motivation (CM), Vitality and Lifelong Learning and Adaptability (LLA)

| | 1 | 2 | 3 | 4 | 5 |
|-------------------------|----------|----------|---------|---------|---------|
| BPN satisfaction | 1 | | | | |
| BPN frustration | -0.373** | 1 | | | |
| AM | 0.234* | 0.198* | 1 | | |
| CM | -0.009 | 0.401** | 0.546** | 1 | |
| Vitality | 0.398* | -0.610** | -0.092 | -0.225* | 1 |
| LLA | 0.297** | -0.165 | 0.018 | -0.122 | 0.352** |

*p<0.05 ** p<0.01

Table 2 represents the Pearson's correlation of the mean scores on the different variables (BPNsat, BPNfrus, AM, CM, Vitality and LLA) of the four questionnaires. Significant negative correlations were found between BPNsat and BPNfrus (-0.373, $p < 0.01$), between CM and Vitality (-0.225, $p < 0.05$) and between BPNfrus and Vitality (-0.610, $p < 0.01$). Significant positive correlations were observed between BPNsat and AM (0.234, $p < 0.05$), BPNsat and Vitality (0.398, $p < 0.05$), BPNsat and LLA (0.297, $p < 0.01$). BPNfrus was positively correlated with both AM (0.198, $p < 0.05$) and CM (0.401, $p < 0.01$) and Vitality and LLA were also positively correlated (0.352, $p < 0.01$).

Overview of the Structural Equation Modelling (SEM) Analyses

At first, we tried to fit the hypothesized model (Figure 1), but we couldn't find a good model fit for our dataset. The model fit indices for this model were $\chi^2=3152.05$ ($df=1866.00$, $p=0.00$), CFI=0.65, TLI=0.63, RMSEA=0.08 and SRMR=0.11. Based on the lack of significant correlations among some of the study variables (Table 2) we suspected that a good model fit for the hypothesized model was unlikely (Figure 1). However, we did expect to find an acceptable model fit for the lower part (BPNfrus-CM-Vitality-LLA) of the hypothesized model because of the significant correlations between these variables.

Next, we decided to analyze the data step by step to understand our negative findings. The model fit for the Vitality-LLA model was good: $\chi^2=100.36$ ($df=89.00$, $p=0.19$), CFI=0.98, TLI=0.98, RMSEA=0.04 and SRMR=0.06. Because AM did not correlate significantly with Vitality we split the model into upper and lower parts and performed SEM only on the lower part (CM-Vitality-LLA) of the model (bold part of Figure 2). The model fit for this part was acceptable with $\chi^2=285.57$ ($df=227.00$, $p=0.01$), CFI=0.95, TLI=0.94, RMSEA=0.05 and SRMR=0.08. In Figure 2, the bold part was tested and represents the structural part of the model found.

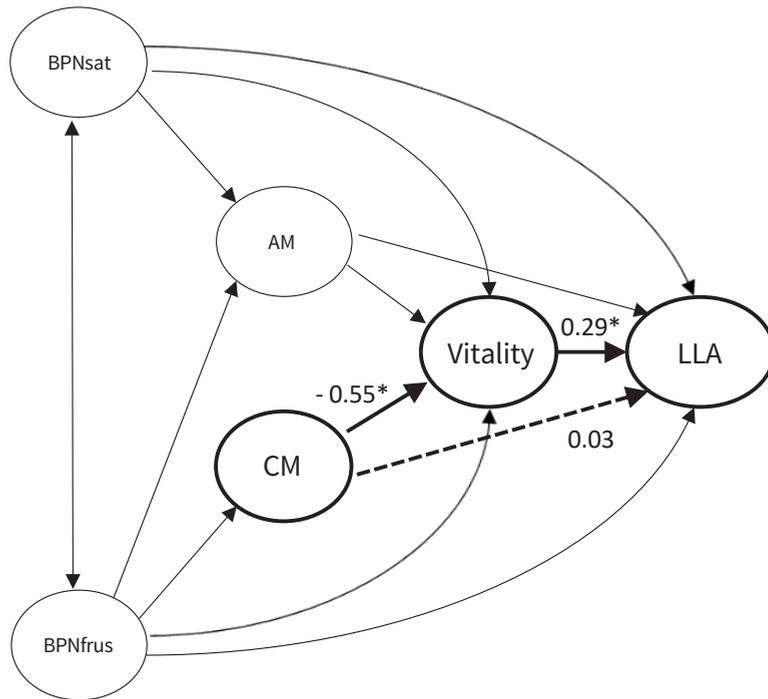


Figure 2. Structural Relations found between Controlled Motivation (CM), Vitality and Lifelong Learning and Adaptability (LLA)

Based on SDT literature we know that motivation is influenced by satisfying or frustrating BPN. Therefore we wanted to determine how BPN influenced CM, Vitality and LLA. Since only the correlations between the BPN frustration and CM were significant we ran the following model: BPNfrus-CM-Vitality-LLA with indirect (through CM) and direct effects of BPNfrus on Vitality and LLA (bold part of Figure 3). Model fit parameters showed an acceptable model fit: $\chi^2=666.73$ (df=550.00, $p=0.00$), CFI=0.93, TLI=0.92, RMSEA=0.05 and SRMR=0.08. In Figure 3 the bold part was tested and represents the structural part of the model found.

Our results show that we could not find a good model fit for the hypothesized model, but we did find an acceptable model fit for the CM-Vitality-LLA model (Figure 2) and for the BPNfrus-

CM-Vitality-LLA model (Figure 3). The model in Figure 2 shows a significant negative direct effect of CM on vitality (-0.55) and indirect effect on LLA (through vitality) and a significant positive direct effect of vitality on LLA (0.29). A significant direct effect of CM on LLA could not be found. The model in Figure 3 shows no indirect effect of the BPNfrus through CM on vitality, but shows a significant positive direct effect of BPNfrus on CM (0.88), a significant negative direct effect on vitality (-1.61) and an indirect effect on LLA through vitality. A significant direct effect of BPNfrus on LLA was not found. The positive direct effect of vitality on LLA (0.38) was also significant.

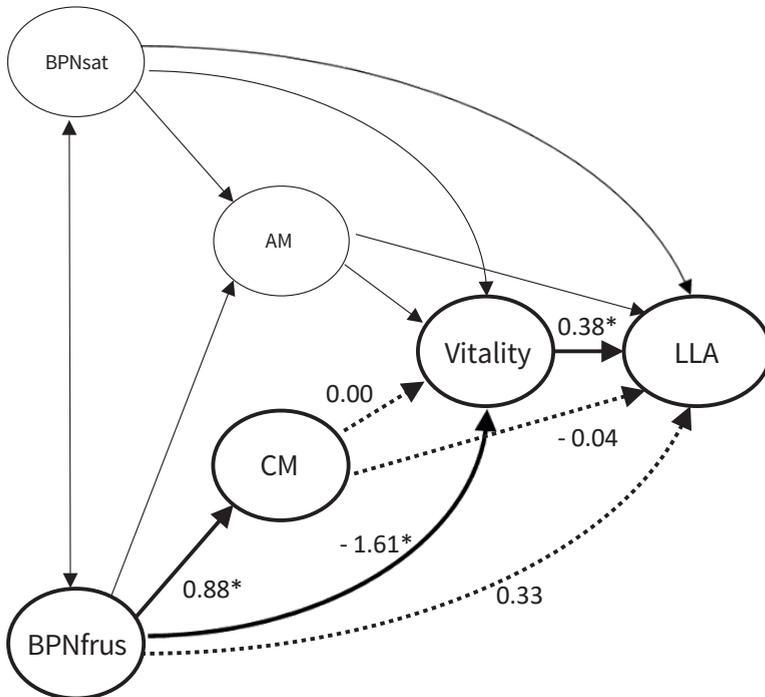


Figure 3. Structural Relations found between Basic Psychological Needs frustration (BPNfrus), Controlled Motivation (CM), Vitality and Lifelong Learning Adaptability (LLA)

DISCUSSION

Based on SDT literature that distinguishes “bright” and “dark” pathways in an integrated model,^{26,43,44} we find only support for structural relationships on the lower “dark” side between frustration of BPN, CM, Vitality and LLA (Figure 3). In this model we couldn’t confirm the mediating role for CM between BPNfrus (predictors) and vitality (outcome). The BPN seem to only indirectly affect LLA through vitality and not directly.

In the first model (CM-Vitality-LLA, Figure 2), CM is a predictor and independent variable and vitality serves as mediator for LLA. Unlike earlier studies²⁴ that found direct structural relationships between Relative Autonomous Motivation (RAM) and learning outcomes like good study strategies and indirect relationships of RAM on academic performance through good study strategies and more study effort, we couldn’t find a direct structural relationship of CM on LLA. However, we did find an indirect effect of CM through vitality on LLA. Adding the frustration of the BPN as a variable in the model results in the second model (Figure 3) that shows more important direct structural relationship of frustration of the BPN on vitality (-1.61) at the expense of the former structural relationship found in the first model of CM directly on vitality (-0.55) and indirectly on LLA. Our findings suggest that frustration of BPN could be an important negative predictor for vitality/well-being (directly) and LLA (indirectly) in pharmacists. Satisfying or frustrating BPN as possible predictors for psychological functioning and learning outcomes are supported by earlier studies conducted in different contexts with workers, athletes and across different cultures within SDT.^{26,28-30}

The positive direct relationship between BPNfrus and CM (0.88), the negative direct relationship between BPNfrus and vitality (-1.61) and the positive direct relationship between vitality and LLA (0.38) in our model in Figure 3 align with SDT and

are supported by other SDT studies using structural equation modelling.^{24,43,44}

Unexpectedly, we found that frustrating BPN was significantly positively correlated (0.198, $p < 0.05$) to AM. However, we also found that frustrating BPN was positively correlated to CM (0.401, $p < 0.01$), satisfying BPN was positively correlated to AM (0.234, $p < 0.05$) and that BPNfrus and BPNsat were negatively correlated (-0.373, $p < 0.01$) as expected based on SDT. By running more detailed analyses, we found out that a subgroup with high quantity motivation (high scores on both AM and CM) exists ($n=31$) in our dataset that may explain the positive correlation between BPN frustration and AM. The autonomy scores on BPNsat ($M=3.79$, $SD=0.50$) and BPNfrus ($M=2.61$, $SD=0.68$) from this group were both higher than the average scores of 2.45 and 3.59, respectively.

In our dataset we could also identify a subgroup with a very high correlation (0.82, $p < 0.01$) between AM and CM compared to the correlation of the whole dataset (0.55, $p < 0.01$). This could indicate that the distinction between AM and CM in this specific group is not very clear and therefore statistically explains an overall positive correlation between BPN frustration and AM. An explanation of this phenomenon could be that the scores on BPN frustration questions like “I feel obligated to do most of the things that I do in CE” and “I feel forced to do things that I wouldn’t do by choice” are high in an obligatory CE system like ours even though people have high AM or both high AM and CM.

Implications for Practice

Satisfaction of BPN has often been studied in relation to autonomy-supportive teaching.^{18,19} However, the previously studied educational contexts differ from ours because autonomy-support could be provided in a particular environment like a high school or university. In our context the measured basic

needs were related to the national CE system and did not depend only on teaching styles and school regulations. BPN satisfaction also depends on teaching styles and CE formats of CE providers which the current CE system cannot influence.

Increasing the satisfaction and decreasing the frustration of the BPN (autonomy, relatedness and competence) can contribute to a sustainable, vitalizing and motivating CE/CPD system. Our findings suggest that preventing BPN frustration is important for the well-being and learning outcomes of pharmacists. To design a teaching and learning CE system that will be fully autonomy-supportive, collaboration between CE providers and regulators is necessary. Together they could identify learner needs, develop autonomy-supportive formats/regulations for CE and encourage the learners to take responsibility for learning. Consequently, educational formats with optimal challenges and choices in learning could lead to more positive well-being of pharmacists and better learning outcomes in CE and thus better patient care.

Limitations and Future Research

Although the AMS is a widely used and validated scale in different contexts, this is the first time that it has been used in CE for healthcare professionals. This could be considered a limitation of the study. Even though we found acceptable reliabilities (based on the Cronbach's alphas) for the AMS subscales, we recommend the construction of a new scale with specific construct validity for measuring the quality of motivation among health professionals.

During our research it was not possible to measure actual performance or learning outcomes independently in our population. We therefore used self-assessment scales like LLA which might bias the results we found.

Because our findings suggest that BPN play an important role as predictors for psychological functioning and good learning outcomes, questions for future research are: “What are the pharmacists’ needs for CE?” and “How can we ensure the satisfaction of these needs and prevent their frustration?”

CONCLUSION

Our findings, supported by SDT literature, suggest that BPN are important predictors for well-being and learning outcomes, because frustration of BPN is negatively related to vitality (directly) and to learning outcomes in CE (indirectly). Further research should be conducted to discover how we can prevent these needs from being frustrated in order to design a motivating, vitalizing and sustainable CE/CPD system for pharmacists and other healthcare professionals.

Acknowledgements

The authors thank Sandra Korsten and Simone van den Bosch, pharmacy students from Utrecht University, who helped collect the data. A special thanks for Xynthia Kavelaars, student from Methodology and Statistics for the Behavioral, Biomedical, and Social Sciences Methods and Statistics at Utrecht University for helping with the *Structural Equation Modelling* analyses in R.

List of used Abbreviations in Alphabetical order

AM = Autonomous Motivation

AMS = Academic Motivation Scale

BPN= Basic Psychological Needs

BPNfrus = frustration of Basic Psychological Needs

BPNsat = satisfaction of Basic Psychological Needs

BPNT = Basic Psychological Needs Theory

CE = Continuing Education

CFI = Comparative Fit Index

CM = Controlled Motivation

CPD = Continuing Professional Development

LLA = Lifelong Learning and Adaptability

RAM = Relative Autonomous Motivation

RMSEA = Root Mean Square Error of Approximation

SEM = Structural Equation Modelling

SDT = Self-Determination Theory

SRMR = Standardized Root Mean Square Residual

TLI = Tucker-Lewis Index

REFERENCES

1. Towle A. Changes in health care and continuing medical education for the 21st century. *Br Med J*. 1998;316(7127):301.
2. Rouse MJ. Continuing professional development in pharmacy. *J Pharm Technol*. 2004;20(5):303-306.
3. Forsetlund L, Bjorndal A, Rashidian A, et al. Continuing education meetings and workshops: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev*. 2009;(2).
4. Eisenberg JM. Continuing education meets the learning organization: the challenge of a systems approach to patient safety. *J Cont Educ Health Prof*. 2000;20(4), 197-207.
5. Williams BW. The prevalence and special educational requirements of dyscompetent physicians. *J Cont Educ Health Prof*. 2006;26(3), 173-191.
6. Tran D, Tofade T, Thakkar N, Rouse M. US and international health professions' requirements for continuing professional development. *Am J Pharm Educ*. 2014;78(6):129.
7. Janke KK, Tofade T. Making a curricular commitment to continuing professional development in doctor of pharmacy programs. *Am J Pharm Educ*. 2015;79(8):112.
8. Meštrović A, Rouse MJ. Pillars and foundations of quality for continuing education in pharmacy. *Am J Pharm Educ*. 2015;79(3):45.
9. Lugtenberg M, Zegers-van Schaick JM, Westert GP, Burgers JS. Why don't physicians adhere to guideline recommendations in practice? An analysis of barriers among Dutch general practitioners. *Implement Sci*. 2009;4(1):54.
10. Donyai P, Herbert RZ, Denicolo PM, Alexander AM. British pharmacy professionals' beliefs and participation in continuing professional development: a review of the literature. *Int J Pharm Pract*. 2011;19(5):290-317.
11. Gandi JC, Wai PS, Karick H, Dagona ZK. The role of stress and level of burnout in job performance among nurses. *Ment Health Fam Med*. 2011;8(3):181.

12. Newell JM, MacNeil GA. A comparative analysis of burnout and professional quality of life in clinical mental health providers and health care administrators. *J Workplace Behav Health*. 2011;26(1):25-43.
13. Quickscan (Schaufeli) "Bezieling in de zorg". 2014. Available at: http://www.beroepseer.nl/images/stories/documenten/samenvatting_onderzoek_zorgprofessionals_vvaa_2014.pdf Accessed March 2017.
14. Maslow AH, Frager R, Cox R. *Motivation and personality* (Vol. 2, pp. 1887-1904). J. Fadiman, & C. McReynolds (Eds.). New York: Harper & Row; 1970.
15. Bandura A, Cervone D. Differential engagement of self-reactive influences in cognitive motivation. *Organ Behav Hum Decis Process*. 1986;38(1):92-113.
16. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol*. 2000;55(1):68.
17. Pintrich PR. An achievement goal theory perspective on issues in motivation terminology, theory, and research. *Contemp Educ Psychol*. 2000;25(1):92-104.
18. Vansteenkiste M, Simons J, Lens W, Sheldon KM, Deci EL. Motivating learning, performance, and persistence: the synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *J Pers Soc Psychol*. 2004;87(2):246.
19. Guay F, Ratelle CF, Chanal J. Optimal learning in optimal contexts: The role of self-determination in education. *Can Psychol/Psychol Can*. 2008;49(3):233.
20. Kusurkar RA, Croiset G, Mann KV, Custers E, Ten Cate O. Have motivation theories guided the development and reform of medical education curricula? A review of the literature. *Acad Med*. 2012;87(6):735-743.
21. Deci EL, Ryan RM. Self-determination theory: A macrotheory of human motivation, development, and health. *Can Psychol/Psychol Can*. 2008;49(3):182.
22. Abassi M, Dargahi Sh. Role of Procrastination, Self-Regulation and Metacognition in Predicting Students' Academic Motivation. *Educ Strategies Med Sci*. 2014;7(5):273-278.

23. Soenens B, Vansteenkiste M. Antecedents and outcomes of self-determination in 3 life domains: The role of parents' and teachers' autonomy support. *J Youth Adolesc.* 2005;34(6):589-604.
24. Kusurkar RA, Ten Cate TJ, Vos CMP, Westers P, Croiset G. How motivation affects academic performance: a structural equation modelling analysis. *Adv Health Sci Educ.* 2013;18(1):57-69.
25. Vansteenkiste M, Niemiec CP, Soenens B. The development of the five mini-theories of self-determination theory: An historical overview, emerging trends, and future directions. In: *The decade ahead: Theoretical perspectives on motivation and achievement.* Emerald Group Publishing Limited; 2010:105-165.
26. Ryan RM, Deci EL. The darker and brighter sides of human existence: Basic psychological needs as a unifying concept. *Psychol Inq.* 2000;11(4):319-338.
27. Vansteenkiste M, Ryan RM. On psychological growth and vulnerability: Basic psychological need satisfaction and need frustration as a unifying principle. *J Psychother Integr.* 2013;23(3):263.
28. Bartholomew KJ, Ntoumanis N, Ryan RM, Bosch JA, Thøgersen-Ntoumani C. Self-determination theory and diminished functioning: The role of interpersonal control and psychological need thwarting. *Pers Soc Psychol Bull.* 2011;37(11):1459-1473.
29. Chen B, Vansteenkiste M, Beyers W, et al. Basic psychological need satisfaction, need frustration, and need strength across four cultures. *Motiv Emot.* 2015;39(2):216-236.
30. Ryan RM, Bernstein JH, Brown KW. Weekends, work, and well-being: Psychological need satisfactions and day of the week effects on mood, vitality, and physical symptoms. *J Soc Clin Psychol.* 2010;29(1):95-122.
31. Tjin A Tsoi SLN, De Boer A, Croiset G, Koster AS, Kusurkar RA. Unraveling motivational profiles of health care professionals for continuing education: The example of pharmacists in the Netherlands. *J Cont Educ Health Prof.* 2016;36(1):46-54.
32. Tjin A Tsoi SLN, De Boer A, Croiset G, Koster AS, Kusurkar RA. Factors Influencing Participation in Continuing Professional Development: A Focus on Motivation Among Pharmacists. *J Cont Educ Health Prof.* 2016;36(3):144-150.

33. Tjin A Tsoi SLN, De Boer A, Croiset G, Koster AS, Kusurkar RA. (in press). Exploring changes in the motivation of Dutch pharmacists with respect to the current Continuing Education system: a longitudinal approach.
34. Ryan RM, Frederick C. On energy, personality, and health: Subjective vitality as a dynamic reflection of well-being. *J Pers.* 1997;65(3):529-565.
35. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine.* 2000;25(24):3186-3191.
36. Vallerand RJ, Pelletier LG, Blais MR, Briere NM, Senecal C, Vallieres EF. The Academic Motivation Scale: A measure of intrinsic, extrinsic, and amotivation in education. *Educ Psychol Meas.* 1992;52(4):1003-1017.
37. Kelley KA, Stanke LD, Rabi SM, Kuba SE, Janke K. K. Cross-validation of an instrument for measuring professionalism behaviors. *Am J Pharm Educ.* 2011;75(9):179.
38. Schreiber JB, Nora A, Stage FK, Barlow EA, King J. Reporting structural equation modeling and confirmatory factor analysis results: A review. *J Educ Res.* 2006;99(6):323-338.
39. Barrett P. Structural equation modelling: Adjudging model fit. *Pers Individ Dif.* 2007;42(5):815-824.
40. Hooper D, Coughlan J, Mullen M. Structural equation modelling: Guidelines for determining model fit. *Articles.* 2008:2.
41. Nunnally JC, Bernstein IH. The assessment of reliability. *Psychometric Theor.* 1994;3(1):248-292.
42. Suhr D, Shay M. Guidelines for reliability, confirmatory and exploratory factor analysis. *Analytics & Statistics.* 2009:1-17.
43. Haerens L, Aelterman N, Vansteenkiste M, Soenens B, Van Petegem S. Do perceived autonomy-supportive and controlling teaching relate to physical education students' motivational experiences through unique pathways? Distinguishing between the bright and dark side of motivation. *Psychol Sport Exerc.* 2015;16:26-36.
44. Olafsen AH, Niemiec CP, Halvari H, Deci EL, Williams GC. On the dark side of work: a longitudinal analysis using self-determination theory. *Eur J Work Org Psychol.* 2017;26(2):275-285.



CHAPTER 6

Regaining Passion in Healthcare Professionals by Designing a Motivating System for Continuing Education and Continuing Professional Development

Under Preparation

March 2017

Sharon L. N. Tjin A Tsoi

Anthonius de Boer

Gerda Croiset

Andries S. Koster

Rashmi A. Kusurkar

ABSTRACT

Healthcare professionals suffer from increased bureaucracy caused by more strict government regulations and the interference of health insurance companies. In addition one out of three pharmacists have reported experiencing burnout. Applying Self-Determination Theory's (SDT) basic needs to professional learning and the development of healthcare professionals can possibly restore their energy. SDT is a theoretical framework that is widely used in education. This paper discusses the lessons learned from research on pharmacists' motivation in Continuing Education (CE) / Continuing Professional Development (CPD) and elaborates on the principles of autonomy-supportive teaching. These principles can be translated into best practices and tips for a motivating system for CE/CPD for healthcare professionals, which can help these healthcare professionals regain their passion for their work.

INTRODUCTION

Recently (2015) a quickscan on “passion in healthcare” among 1200 Dutch healthcare professionals like general practitioners, medical specialists, dentists, pharmacists and physical therapists was performed in which having a high energy level meant being a passionate professional and a low energy level meant having complaints of distress.¹ Passionate healthcare professionals are satisfied and happy in their jobs and are more committed to their teams and organizations because they have a high energy level and they don’t intend to switch jobs or careers. The results of this quickscan indicate that healthcare professionals’ passion seems to suffer from increased bureaucracy caused by more strict government regulations and the interference of health insurance companies.¹ Although more healthcare professionals were passionate about their jobs compared to other professions, 13% considered switching careers within a year. Physical therapists and pharmacists suffered the most from the increasing administrative tasks and almost 25% of the pharmacists wanted to change jobs within a year. Moreover, one out of three pharmacists reported that they suffered from burnout.¹ Increasing stress among pharmacists is not unique for the Netherlands, but has been found in other countries as well.^{2,3} Considering that the poor well-being of health professionals as exemplified by burnout has been found to be negatively related with good quality patient care, this trend should be reversed.⁴ One of the reported energy resources in the quickscan was the possibility to learn and develop professionally.¹ We think restoring this energy resource in a motivating way could help healthcare professionals regain their passion for their work.

Lifelong Learning Trends in Healthcare Professions

Besides being an energy resource for healthcare professionals, lifelong learning and professional development are also

pivotal to reinforce and maintain knowledge and competencies due to fast contemporary healthcare changes. In lifelong learning, the Continuing Education (CE) and Continuing Professional Development (CPD) of healthcare professionals are prerequisites for high quality healthcare. CE has been around for decades, but CPD is a relatively new concept and is defined as an on-going cycle (Figure 1) to encourage continuous improvement through four main stages: 1) reflection: thinking about your practice, 2) planning: deciding what and how to learn, 3) action: recording what you learned and 4) evaluation: identifying the benefits of your learning.⁵

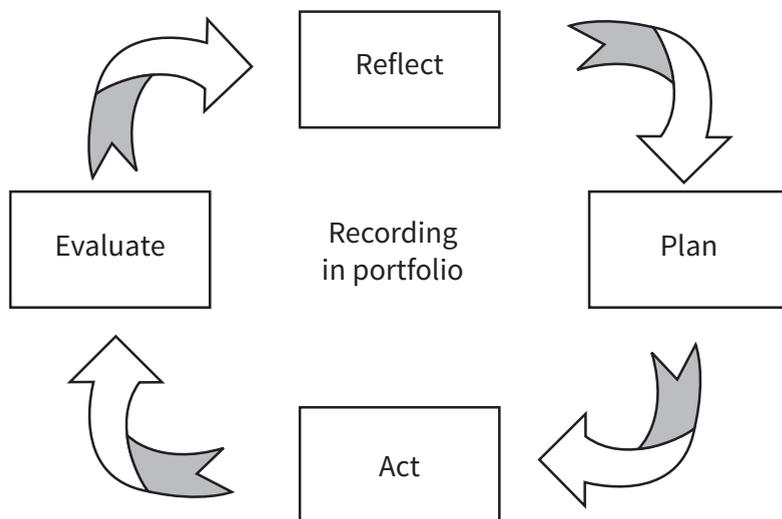


Figure 1. The Different Stages of the Continuing Development Cycle Based on Rouse⁵

CE activities focused on knowledge and competencies can often be seen as a part of the CPD cycle. There is a wide variety in CE and CPD frameworks across the globe for pharmacists and other healthcare professions.^{6,7} Moreover there is a lack of consensus about the implementation and quality assurance of CE and CPD. Quality of CE and CPD frameworks is determined

by attitudes, beliefs, facilitators and barriers for healthcare professionals' CE/CPD participation.⁷⁻¹³ Therefore motivation seems to play a crucial role both as a facilitator and a barrier in their CE participation. For example, CE activities with an interesting topic can entice professionals to participate, however too challenging CE activities can hinder their CE participation. Accordingly, our recent study among Dutch pharmacists showed a positive correlation between motivation and pharmacists' CE credits.¹⁴

Self-Determination Theory applied in Education

Although the increasingly important role of healthcare professionals' motivation in relation to CE/CPD becomes more visible and the relationship with the quality of healthcare becomes more clear, research on this theme is scarce. The Self-Determination Theory (SDT) is a theoretical framework that is widely used from primary to higher and postgraduate education.¹⁵⁻¹⁷ In health professions education SDT has been applied in medical, pharmacy and dental education.¹⁸⁻²⁰ SDT has also generated evidence across domains like health (e.g. smoking cessation and diets), sports and psychology (e.g. in parenting and occupational organizations).¹⁶ SDT distinguishes three motivational constructs: 1) *amotivation*, which refers to the lack of intention to act, 2) *controlled motivation* (CM), which refers to pursuing an activity out of sense of obligation and 3) *autonomous motivation* (AM), which refers to engaging in an activity out of genuine interest or by valuing the importance of it. Amotivation is represented by a non-regulation state. CM is determined by *external regulation*, in which individuals act to obtain rewards or to avoid punishments, and *introjected regulation*, in which the behavior is regulated by external requirements or to avoid internal conflict like feelings of shame and guilt. AM is determined by *identified regulation*, in which individuals value the activity as personally important and act of their own free will, and *intrinsic regulation*, in which

they act out of genuine interest. The two least autonomous constructs, amotivation and CM, have been associated with poor educational outcomes like low competence, dropping out of school and test anxiety. The most autonomous construct, AM, has been associated with positive educational outcomes like positive well-being, better conceptual understanding and persistence.^{15,17,18} (Figure 2)

SDT-based research demonstrates that all individuals have the need to feel autonomous, competent and related to their social surroundings like peers and role models in order to stimulate self-determination in their actions. These needs are termed the *basic psychological needs*. Fulfilling these needs will facilitate autonomous motivation which leads to positive outcomes while thwarting them will yield less optimal motivation forms which can lead to negative outcomes.¹⁶

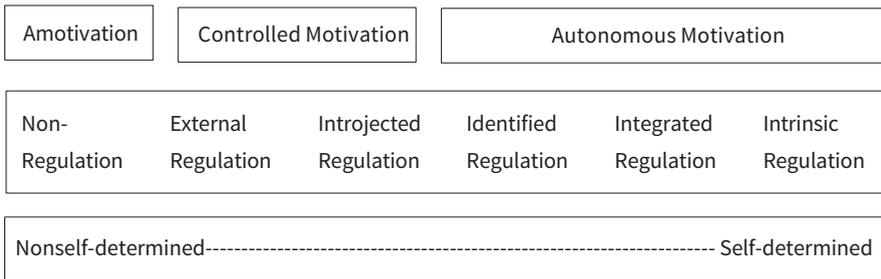


Figure 2. Self-Determination Continuum based on Deci and Ryan¹⁵

Lessons Learned from Research among Pharmacists

Research into the motivation of pharmacists for CE/CPD has included investigations into the motivational profiles of pharmacists, the distribution of these profiles across the demographic characteristics of pharmacists, the influence of the type of motivation on participation in CE/CPD, the change in motivation across time and the demographic characteristics

that influence this change.^{14,20,21} Since we wanted to explore pharmacists' motivation in CE, factors influencing their CE participation and the stability of their motivation in the current CE system, we conducted a study based on SDT in the Netherlands.^{14,20,21} Four different motivational profiles were unraveled in our study: 1) a good quality with high AM and low CM, 2) a high quantity with high AM and high CM, 3) a poor quality with low AM and high CM and 4) a low quantity with low AM and low CM.²⁰ This person-centered analysis was based on earlier studies which have demonstrated that different dimensions of motivation can coexist within a single person in different gradations.²²⁻²⁴ The motivational profiles we found were associated with gender, working environment, ownership, working experience and traineeship. For example, females were highly represented (about 35.5 %) in the good quality profile and males were equally (21.2-27.2%) distributed among the four profiles. Community pharmacists were more (34.5%) represented in the high quantity profile than pharmacists working in a hospital who were highly (42.5%) represented in the good quality profile.²⁰ Our findings support a custom-made CE approach which has been suggested by other researchers as well.^{25,26} Personal learning journeys may cater to all types of motivation and therefore foster the right type of motivation per individual.

As pharmacists' participation in CE is crucial for the success of any CE/CPD system, we studied the relationship between pharmacists' motivation and their CE credits collected for a period of almost a year.¹⁴ The participation of pharmacists in CE activities was positively correlated to self-determined motivation. Other demographic factors like pharmacy school, traineeship and work experience also seem to influence their CE participation. These findings demonstrate that pharmacists' CE participation is influenced by their motivation.¹⁴

Although motivation is recognized as a dynamic entity, change in motivation over time is a less studied phenomenon, despite the impact this could have on the well-being of healthcare professionals and thus the quality of patient care.⁴ Because the current CE system is mostly based on collecting CE credits, we wanted to know if pharmacists' motivation in CE would change across time in the current system. Longitudinal studies performed with high school, undergraduate and university students have shown the change in motivation across time.²⁷⁻²⁹ Educational circumstances like teaching and learning methods lead to motivational shifts from more self-determined to less self-determined forms and vice versa.³⁰⁻³² This means that even when healthcare professionals start with a good quality motivation in CE, negative circumstances like controlled incentives, e.g. collecting CE credits and receiving financial rewards for CE, can cause a shift towards less desirable motivation forms like controlled motivation (CM). On the contrary, the motivation of healthcare professionals in distress could be restored by supporting autonomous motivation (AM) with customized CE activities provided by well-trained teachers who can create a greater readiness for CE engagement.³²⁻³⁴ Our study shows an increase in pharmacists' controlled motivation (CM) which leads to a decrease in their self-determined motivation across time. Consequently this shift of motivation across time could jeopardize their CE participation and therefore put patient care at risk.

The findings of our research advocate a critical evaluation of the outcomes of CE/CPD systems of pharmacists and other healthcare professions across the globe. Additionally we propose regulatory and educational interventions like autonomy-supportive teaching, based on SDT, that will foster and stimulate more self-determined motivation and thus improve the quality of learning outcomes. With these interventions it might be possible to restore healthcare

professionals' passion and foster their motivation in CE in a sustainable CE/CPD system that will lead to high quality healthcare.

What is Autonomy-supportive Teaching?³²⁻³⁴

Autonomy-supportive teaching means the manner of teaching which supports the needs for autonomy, competence and relatedness. Autonomy-supportive classroom teaching is characterized by: identifying learner needs, letting autonomous motivation guide learning behavior, encouraging active participation of learners, encouraging learner responsibility for learning, providing structured guidance, providing optimal challenges in learning, providing positive and constructive feedback, giving emotional support, acknowledging feelings of negative affect, communicating value in uninteresting activities, giving choices in learning and using autonomy-supportive language (like may, can and could) in communication.³²⁻³⁴

We provide a translation of autonomy-supportive classroom teaching into autonomy-supportive teaching and learning in the CE/CPD context in Table 1 as best practices and tips for a motivating system for CE/CPD.

CONCLUSION

The field of motivation psychology is emerging in (healthcare) education.^{14,18-21,35} The lens of Self-Determination Theory provides us with new insights into pharmacists' motivation in CE.^{14,20,21} These insights could be useful for every healthcare professionals' CE/CPD system across the globe. This paper is a call for more international collaboration on the quality assurance and design of well-functioning and motivating CE/CPD systems for healthcare professionals. With new and improved CE/CPD systems we could restore the passion of healthcare professionals in their jobs and achieve the best quality healthcare for the future.

Implications for Practice

- Healthcare professionals' passion seems to suffer from increased bureaucracy and the interference of health insurance companies.
- Research among pharmacists shows different motivational profiles, the possible influence of their motivation on CE participation and changes in motivation over time.
- Autonomy-supportive teaching could help restore healthcare professionals' passion in their jobs and achieve the best quality healthcare for the future.

Table 1. Translating Autonomy-supportive Classroom Teaching into Autonomy-supportive Teaching and Learning in the CE/CPD Context with Best Practices and Tips for a Motivating CE/CPD System

Best Practices and Tips for a Motivating System for CE/CPD

For fulfilling the need for Autonomy

- Put effort into identifying the learning needs of the healthcare professionals in order to construct relevant learning activities
- Provide opportunities for charting personal learning journeys within the CE/CPD structure
- Create an autonomy-supportive teaching and learning environment in CE/CPD³²⁻³⁴
- Train CE providers and teachers to create autonomy-supportive learning and teaching environments

For fulfilling the need for Competence

- Create CE activities at different degrees of difficulty in order to provide optimally challenging learning for every level of competence
- Provide a benchmark for competencies through national and international consensus for the healthcare professionals to compare with and strive towards
- Use learning outcomes as a criteria for reregistration in order to stimulate the CE participation of healthcare professionals based on gaining desirable knowledge and competencies rather than on CE credits provided

For fulfilling the need for Relatedness

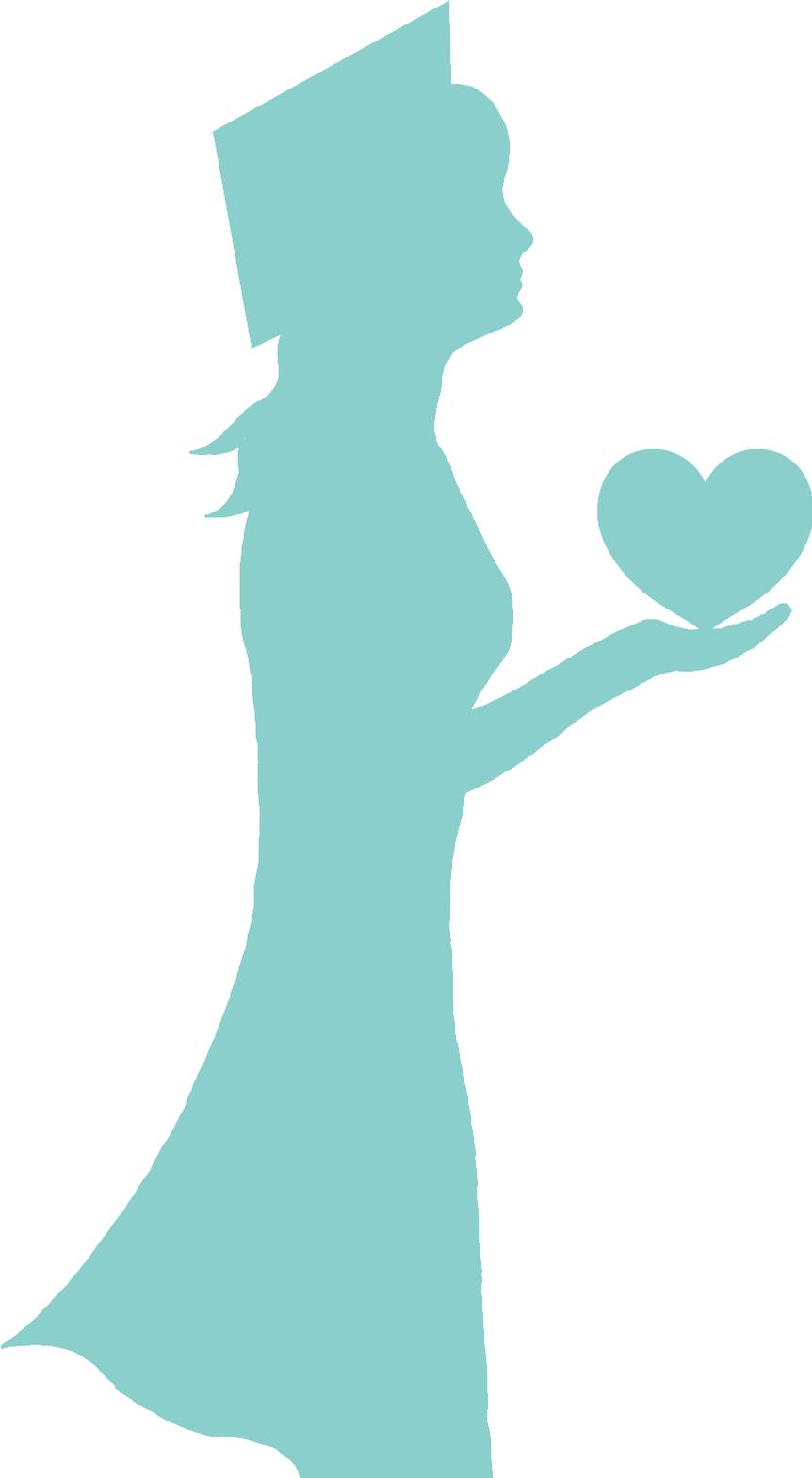
- Create a safe environment (also part of autonomy-supportive teaching) for sharing experiences of practice guided by trained moderators
- Create opportunities for interaction with other healthcare professionals in both face-to-face learning and e-learning sessions

REFERENCES

1. *Nationaal welzijnsonderzoek (2014)*. Available at: http://www.beroepseer.nl/images/stories/documenten/samenvatting_onderzoek_zorgprofessionals_vvaa_2014.pdf Published 21 mei 2015.
2. *National pharmacist workforce survey 2014*. Available at: <http://www.aacp.org/resources/research/pharmacyworkforcecenter/Documents/ExecutiveSummaryFromTheNationalPharmacistWorkforceStudy2014.pdf> Published april 2015.
3. McCann L, Hughes CM, Adair CG, & Cardwell C. Assessing job satisfaction and stress among pharmacists in Northern Ireland. *Pharm World Sci*. 2009;31(2):188.
4. Scheepers RA, Boerebach BC, Arah OA, Heineman MJ, & Lombarts KM. A systematic review of the impact of physicians' occupational well-being on the quality of patient care. *Int J Behav Med*. 2015; 22(6):683-698.
5. Rouse MJ. Continuing professional development in pharmacy. *Journal of Pharmacy Technology*. 2004;20(5):303-306. FIP report.
6. Fleet LJ, Kirby F, Cutler S, Dunikowski L, Nasmith L, & Shaughnessy R. Continuing professional development and social accountability: a review of the literature. *J Interprof Care*. 2008;22(sup1):15-29.
7. Donyai P, Herbert RZ, Denicolo PM, et al. British pharmacy professionals' beliefs and participation in continuing professional development: a review of the literature. *Int J Pharm Pract*. 2011;19:290-317.
8. Hanson AL. Pharmacists' attitudes toward continuing education: implications for planning curricular CE programs. *J Cont Educ Health Prof*. 1989;9(2):95-113.
9. Austin Z, Marini A, Glover NM, Croteau D. Continuous professional development: a qualitative study of pharmacists' attitudes, behaviors, and preferences in Ontario, Canada. *Am J Pharm Educ*. 2005;69(1-5):25.
10. Mottram DR, Rowe P, Gangani N, et al. Pharmacists' engagement in continuing education and attitudes towards continuing professional development. *Pharm J*. 2000;269:618-622.
11. Power A, Johnson BJ, Diack HL, et al. Scottish pharmacists' views and attitudes towards continuing professional development. *Pharm World Sci*. 2008;30:136-143.

12. Cobb, S. C. Internet continuing education for health care professionals: an integrative review. *J Cont Educ Health Prof.* 2004;24(3):171-180.
13. Penz K, D'Arcy C, Stewart N, Kosteniuk J, Morgan D, Smith B. Barriers to participation in continuing education activities among rural and remote nurses. *J Cont Educ Nurs.* 2007;38(2):58-66.
14. Tjin A Tsoi SLN, De Boer A, Croiset G, Koster AS, Kusurkar RA. Factors Influencing Participation in Continuing Professional Development: A Focus on Motivation Among Pharmacists. *J Cont Educ Health Prof.* 2016;36(3):144-150.
15. Deci EL, Vallerand RJ, Pelletier LG, Ryan RM. Motivation and education: The self-determination perspective. *Educ Psychol.* 1991;26(3-4):325-346.
16. Deci EL, Ryan RM. *Handbook of self-determination research.* University Rochester Press; 2002.
17. Vallerand RJ, Fortier MS, Guay F. Self-determination and persistence in a real-life setting: toward a motivational model of high school dropout. *J Pers Soc Psychol.* 1997;72(5):1161.
18. Kusurkar R. Motivation in medical students: a PhD thesis report. *Perspect Med Educ.* 2012;1(3):155-157.
19. Orsini C, Evans P, Binnie V, Ledezma P, Fuentes F. Encouraging intrinsic motivation in the clinical setting: teachers' perspectives from the self-determination theory. *Eur J Dental Educ.* 2016;20(2):102-11.
20. Tjin A Tsoi SLN, De Boer A, Croiset G, Koster AS, Kusurkar RA. Unraveling Motivational Profiles of Health Care Professionals for Continuing Education: The Example of Pharmacists in the Netherlands. *J Cont Educ Health Prof.* 2016;36(1):46-54
21. Tjin A Tsoi SLN, De Boer A, Croiset G, Kusurkar RA, Koster AS. Exploring changes in the motivation of Dutch pharmacists with respect to the current Continuing Education system: a longitudinal approach. (submitted 2017).
22. Ratelle CF, Guay F, Vallerand RJ, Larose S, Senécal C. Autonomous, controlled, and amotivated types of academic motivation: A person-oriented analysis. *J Educ Psychol.* 2007;99(4):734.
23. Vansteenkiste M, Sierens E, Soenens B, Luyckx K, Lens W. Motivational profiles from a self-determination perspective: The quality of motivation matters. *J Educ Psychol.* 2009;101(3): 671-18.

24. Kusurkar RA, Croiset G, Galindo-Garré F, Ten Cate O. Motivational profiles of medical students: association with study effort, academic performance and exhaustion. *BMC Med Educ.* 2013;13(1):1.
25. Driesen A, Simoens S, Laekeman G. Continuing education programs for pharmacists: No one size fits all. *Pharm Educ.* 2008:8.
26. Pratt DD, Arseneau R, Collins JB. Reconsidering “good teaching” across the continuum of medical education. *J Cont Educ Health Prof.* 2001;21(2):70-81.
27. Ostovar N, Mesrabadi J. Students’ Motivational Profiles Changes in an Academic Setting: A Longitudinal Study. *Procedia Soc Behav Sci.* 2011;30:1018-1021.
28. Dillon A, Stolk J. The students are unstable! Cluster analysis of motivation and early implications for educational research and practice. In: *Frontiers in Education Conference Proceedings.* 2012:1-6.
29. Otis N, Grouzet FM, Pelletier LG. Latent Motivational Change in an Academic Setting: A 3-Year Longitudinal Study. *J Educ Psychol.* 2005;97(2):170.
30. Reeve J. Why teachers adopt a controlling motivating style toward students and how they can become more autonomy supportive. *Educ Psychol.* 2009;44(3):159-175.
31. Reeve J. Teachers as facilitators: What autonomy-supportive teachers do and why their students benefit. *Elem Sch J.* 2006;106(3):225-236.
32. Furtak EM, Kunter M. Effects of autonomy-supportive teaching on student learning and motivation. *J Exp Educ.* 2012;80(3):284-316.
33. Kusurkar RA, Croiset G, Ten Cate TJ. Twelve tips to stimulate intrinsic motivation in students through autonomy-supportive classroom teaching derived from self-determination theory. *Med Teach.* 2011;33:978-982.
34. Kusurkar RA, Croiset G. Autonomy support for autonomous motivation in medical education. *Med Educ Online.* 2015:20.
35. Vansteenkiste M, Mouratidis A. Emerging Trends and Future Directions for the Field of Motivation Psychology: A Special Issue in Honor of Prof. Dr. Willy Lens. *Psychologica Belgica.* 2016;56(3):118-142. doi: <http://doi.org/10.5334/pb.354>



CHAPTER 7

General Discussion

Motivating and Vitalizing Professional Development for Pharmacists.

What can we Learn from Research and Others?

Under Preparation

April 2017

Sharon L. N. Tjin A Tsoi
Anthonius de Boer
Gerda Croiset
Andries S. Koster
Michael J. Rouse
Rashmi A. Kusurkar

GENERAL DISCUSSION

Reregistration regulations were officially introduced by the Royal Dutch Pharmaceutical Society (KNMP) for Dutch community pharmacists in 1995 and for hospital pharmacists in 2003.^{1,2} For pharmacists to renew their specialist license, they must participate in 200 hours of CE activities such as lectures and workshops in five years.

The regulations for community pharmacists were adjusted in 2015 in a qualitative manner by demanding a minimum percentage of CE hours spent on certain CanMEDS competencies like collaboration and communication.³ However, the quality assurance of CE activities is still weak and outcomes are not yet monitored. Currently, the CE system of hospital pharmacists is in a transition phase.

This thesis assesses the effectiveness of the CE system through the study of pharmacists' motivation in CE using Self-Determination Theory as the theoretical framework.⁴ Research on pharmacists' motivation in CE is used to understand their motivation in CE, the role it plays in CE participation, how it changes over time, and what the structural relationships are among pharmacists' basic psychological needs (BPN), motivation, well-being and lifelong learning adaptability (LLA).

This chapter has the following structure:

- Overall summary of the objectives, main findings and practical implications
- Reflections on the findings in relation to the questions like: What is the role of motivation in pharmacists' Continuing Education? Is the current CE structure conducive to the desirable type of motivation? How can we preserve the desirable motivation type and diminish the less-desirable motivation type over time? What routes can lead to better

learning outcomes, psychological functioning and patient care?

- Strengths and limitations
- Best practices from an international and national perspective
- Recommendations for the design of a motivating and vitalizing system
- New research questions

Table 1. Summary of Objectives, Main Findings and Practical Implications of this Thesis

| Pharmacists' Motivation in Continuing Education in the Dutch CE System | | |
|---|--|--|
| Objectives | Findings | Implications |
| To explore pharmacists' motivation in CE | Different motivational profiles emerged based on the quality and quantity of pharmacists' motivation and were characterized by different demographic factors | Call for custom-made CE activities and personal learning journeys |
| To explore factors, including motivation, that influence pharmacists' CE participation. | Motivation influences CE participation and thus the professional development of pharmacists | Call for considering motivation while developing CE/CPD |
| To identify the dynamics of pharmacists' motivation in CE over time | Pharmacists' less-desirable motivation (CM) increases at the expense of the desirable motivation (AM) | Call for addressing and changing regulations and circumstances in CE/CPD that increase CM |
| To identify a pathway from BPN and motivation to well-being and learning outcomes | BPN are important predictors for well-being and lifelong learning adaptability | Call for assessing learners' BPN in CE to design an effective and energizing CE/CPD system |

AM=Autonomous Motivation, BPN=Basic Psychological Needs, CE=Continuing Education, CM= Controlled Motivation, CPD=Continuing Professional Development

Summary of Findings

The main findings of the thesis are summarized in Table 1. We propose that the current CE system for Dutch pharmacists be redesigned based on the type, dynamics and pathways of pharmacists' motivation in CE. Recommendations and suggestions based on the findings and the examples of global and other national systems are discussed in the last part of the chapter.

What is the Role of Motivation in Pharmacists' Continuing Education? (Chapter 2 and 3)

"Lifelong learning and motivation are indistinguishable: the motivated person is a lifelong learner, and the lifelong learner is a motivated person."-McCombs 1991-¹⁴

In contexts such as elementary school, high school and university, motivation is being considered more often in the design of teaching and learning activities.⁵⁻⁹ Whether motivation has a similar role in lifelong learning has not yet been investigated.

The global trends in pharmacy education show that pharmacists generally value CE/CPD for professional growth and maintaining licensure, and that the benefits of a CPD approach compared to a traditional CE approach are widely accepted.¹⁰⁻¹³ Barriers for CE and CPD include *time constraints, lack of motivation and interest, lack of accreditation system, costs*.¹⁴⁻¹⁸ The motivation described in these studies has never been specified or measured in a qualitative or quantitative way. Although the designs of CE/CPD systems are not often described in detail, it is remarkable that most systems seem to be focused on *what* and *how* we learn, but never on *why* we learn.^{19,20}

The role of motivation in pharmacists' CE participation that appeared in chapter 3 emphasizes the importance of considering motivation in the design of CE activities. The positive association between Relative Autonomous Motivation (RAM) ($B=0.23$; $p=0.03$) and CE hours spent indicates that motivation is a factor that influences CE participation. Unexpectedly, both AM and CM were negatively associated with CE hours spent. A possible explanation for the negative association of AM and CE hours spent could be that the CE activities in the current CE system are not conducive to AM. The negative association between CM and CE hours spent is harder to explain, but we suspect that pharmacists with high scores on CM prefer to collect their CE credits with activities (e.g. conferences abroad and pharmacotherapeutic sessions with general practitioners) outside the structured CE activities. Those activities are often easy to access and mostly offered free of charge.

Furthermore, the motivational profiles that have emerged from our study in chapter 2 highlight the different types of motivation existing in pharmacists. This could imply that a one-size-fits-all approach does not cater to their specific type of motivation and calls for a custom-made approach that enables personal learning journeys. Rather than presenting mean scores on motivation, this person-oriented approach presents the AM and CM in each individual and demonstrates the importance of the quality of motivation versus the quantity.²¹⁻²³ Although motivational profiles are context-specific, persons with an autonomous-oriented profile (high AM and low CM) generally experience better educational outcomes such as deep learning, better academic functioning and better psychological functioning (well-being). On the contrary, persons with a controlled-oriented profile (low AM and high CM) experience poor educational behaviors like surface learning and procrastination and poor psychological functioning like ill-being and test anxiety.²¹⁻²³

Almost 50% of our cases belonged to a controlled-oriented profile, namely the high quantity profile that scored higher on CM than on AM and the poor quality profile (low AM and high CM). Although educational outcomes of the high quantity profile can be similar to those of the good quality profile (high AM and low CM), this will be at the expense of psychological functioning.²⁴⁻²⁶

In conclusion, our findings suggest that the quality of pharmacists' motivation could explain the success or failure of a CE/CPD system. Designing CE activities to stimulate the right type of motivation with a customized approach is a good start to creating an effective CE/CPD system, however more understanding is needed about a CE learning climate that fosters the autonomous-oriented (high AM and low CM) motivation profile.

How does Motivation Change and under What Circumstances? (Chapter 4)

"Learners have a natural inclination to learn and will assume personal responsibility for learning, monitoring, checking for understanding and becoming active, self-regulated learners in the right motivational atmosphere." -McCombs 1991-²⁷

According to Self-Determination Theory autonomy-supportive circumstances that minimize the salience of external incentives and acknowledge the learners' frame of reference will foster *good quality motivation*, thus autonomous motivation (AM).^{28,29} Conversely, contexts that are controlling by pressuring people with incentives, deadlines and punishment have been found to diminish AM.^{30,31}

To better understand the influence of the CE climate on motivation, we wanted to explore the dynamics of pharmacists' motivation in the current CE structure. In chapter 4 we reported

that the less-desirable motivation, controlled motivation (CM) increased (Slope=0.20; $p<0.001$) at the expense of the desirable motivation, autonomous motivation (AM) over a 21-month period. Although AM also increased (Slope=0.07; $p=0.029$), relative autonomous motivation (RAM) decreased (Slope=-0.38; $p=0.002$) which means that within a person AM decreased relative to CM. Even though we cannot ascribe the decrease of RAM only to the CE system, we think the mandatory credit-based system, the lack of structure and the lack of quality assurance of CE providers could have caused the CM to increase and thus RAM to decrease in the pharmacists. Furthermore, a likely consequence of the decrease of pharmacists' RAM is a minimal CE participation that is required to maintain their license.

In the structured settings of high schools and universities the teaching and learning environment is relatively easy to map. In contrast, the teaching and learning environment of an unstructured CE setting is determined by many complicated factors such as governments, pharmacists' associations, CE providers, the social setting in the pharmacy etc. This complex setting is difficult to comprehend. Apart from life events, personal traits and workload, the CE climate for Dutch pharmacists is also influenced by a mandatory credit-based system, regulations of the pharmacists' associations and the quality of CE activities delivered by CE providers.³²⁻³⁴

In conclusion, our findings support the hypothesis that the CE climate for Dutch pharmacists is not autonomy-supportive. To better understand the exact circumstances affecting pharmacists' motivation in CE, further research is needed on questions like "What factors in CE/CPD design increase AM and decrease CM?"

What Routes can Lead to Better Learning Outcomes, Psychological Functioning and Patient Care? (Chapter 5 and 6)

"The concept of need pertains to those nutriments that must be procured by a living entity to maintain its growth, integrity, and health."-Ryan and Deci 2000-³⁵

The concept of Basic Psychological Need Theory (BPNT) plays an important role in Self-Determination Theory and includes three needs: autonomy (feeling of choice), competence (feeling effective) and relatedness (feeling connection with others). Humans thrive in social environments that allow these needs to be satisfied, and have impaired physiological and psychological growth and functioning in environments that frustrate these needs.^{4,35} Literature is more often reporting an increase in psychological ill-being (burnout) among healthcare professionals.^{36,37} A quick scan conducted in 2014 among Dutch healthcare professionals highlighted alarming percentages (15-33%) of healthcare professionals, and pharmacists in particular (33%), who suffer from burnout.³⁸ In chapter 6 we translated best practices from autonomy-supportive classroom teaching into autonomy-supportive teaching and learning in the CE/CPD context. The suggestions presented for a motivating system derive from satisfying the BPN and are based on the lessons we have learned from our studies on pharmacists' motivation. We believe that an autonomy-supportive approach will help restore the passion of healthcare professionals in their jobs and achieve the best quality healthcare for the future. This makes timely research on autonomy-supportive environments pivotal.

With the understanding of the BPN of pharmacists in CE and the structural relationship between psychological functioning and educational outcomes we might get insights into how to re-energize them. In chapter 5 we hypothesized a structural pathway from BPN to educational outcomes. We could not find evidence for the entire hypothesized model, though

our data fit the lower part of the model well. In this study we used vitality as an indicator for psychological well-being and lifelong learning adaptability (LLA) as an indicator for educational outcomes. Our findings support the evidence that controlled motivation is negatively associated with psychological functioning and negatively related to educational outcomes.^{4,24-26} We also found that psychological functioning and educational outcomes are positively associated (direct effect). But the association between CM and poor psychological functioning was not significant when the BPN were added as a variable. The frustration of BPN seems to have a stronger direct negative effect (-1.61; $p < 0.001$) on psychological functioning and an indirect negative effect on educational outcomes. Therefore, our conclusion is that frustration of BPN is a strong predictor for poor psychological functioning and poor educational outcomes like LLA.

In conclusion, the design of a motivating, vitalizing and sustainable CE/CPD system is essential to prevent frustration of BPN in pharmacists.

From Concept to Evidence-Based

The conceptual model in the Introduction (Figure 1) was drawn to visualize a possible roadmap from BPN and motivation in CE/CPD to better patient care. In this model motivation is in the center of BPN, effective professional development through CE/CPD, performance and psychological functioning.

Our findings confirm that motivation plays an important role in the professional development of pharmacists, however the role of BPN seems more prominent according to our last model in chapter 5. The structural model found emphasizes the role of BPN leading to vitality and educational outcomes.

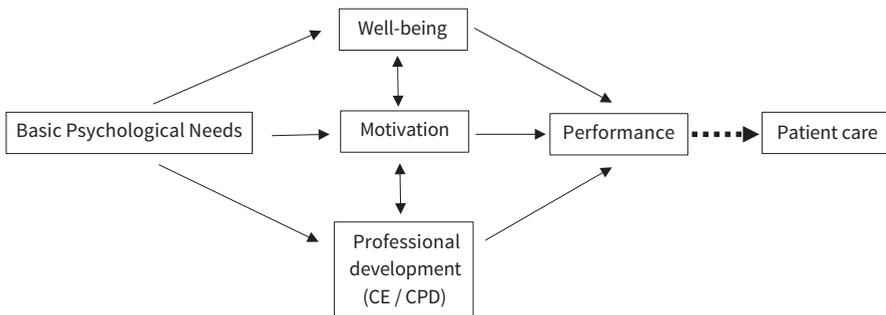


Figure 1. Conceptual Model with Motivation in the Center

Therefore we revised our conceptual model to the diagram in Figure 2. In this diagram BPN rather than motivation plays a central role in motivation, professional development, performance and well-being.

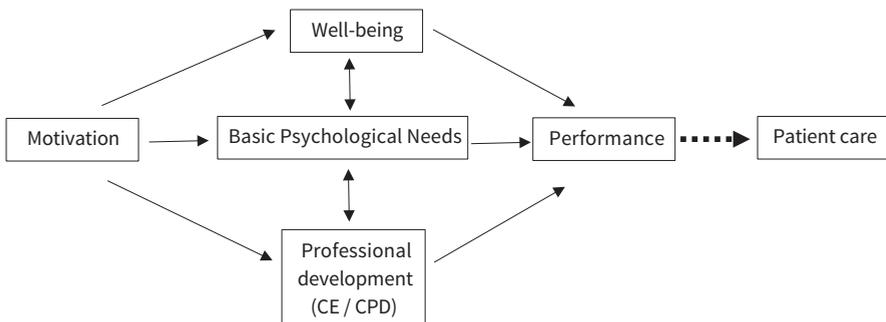


Figure 2. Diagram based on our Findings to Improve Performance of Pharmacists and consequently Patient Care with Basic Psychological Needs (BPN) in the Center

Overall Conclusion

We have found evidence that pharmacists' motivation in CE affects CE participation and that the current CE climate is not conducive to the preferred type of motivation, i.e. autonomous motivation. Moreover, frustrating pharmacists' BPN in CE can

be harmful because the increase of controlled motivation can cause burnout and poor educational outcomes. Lessons learned from global systems and other national systems can inspire the design of a motivating and vitalizing CE/CPD system.

Strengths and Limitations of this Thesis

This is the first PhD dissertation on (postgraduate) pharmaceutical education in the Netherlands and builds on a sound theoretical framework. To our knowledge, pharmacy education research (at both the national and international level) has never been done in light of Self-Determination Theory. We consider it a strength to use this framework in the design of all the studies in a rather new research field. Another novelty about this research is the Continuing Education setting, as there has not been much investigation into motivation and learning in this context.

We also consider the longitudinal design of the study in chapter 4 as a strength. With this design we could compare the scores and dynamics in motivation within the same person.

Other strengths are the analytical methods used such as K-means cluster analyses, Latent Growth Modeling (LGM) and Structural Equation Modelling (SEM) which are considered a good way to analyze psychometric scales and are widely accepted. These methods favor a more person-oriented approach of the data instead of using (only) mean scores of variables for analyses: within-person and between-person effects are therefore compensated for.

The same questionnaire, the Academic Motivation Scale (AMS)³⁹ was used for several linked studies in this thesis. This scale is widely used across several cultures (Canada, Mexico and the US).⁴⁰ AMS has been validated in different contexts and is shown to be time- and gender-invariant.⁴¹⁻⁴³ Using this scale

in the different studies is considered a strength because it provides us with a comprehensive picture of the different facets of pharmacists' motivation in CE.

A limitation of our study was that in this context (at the time of our study) there were no learning outcome data available that are centrally monitored. Therefore, we only could use *CE hours spent* and self-assessment scales (*vitality* and *lifelong learning adaptability* (LLA)) as outcomes. Consequently, our data could be vulnerable to self-report bias.

This study was conducted only in the Netherlands which resulted in small sample sizes. However, power calculations and model fit parameters give us confidence that our results are robust. Comparing our data for *CE hours spent* and barriers and facilitators for CE participation with the international literature showed little or no differences. The possibility of generalizing our results for other healthcare professionals in the Netherlands and beyond needs further investigation.

Although the AMS is widely used and validated in different contexts, this is the first time that it has been used in CE for healthcare professionals. This could be considered a limitation of the study, therefore we recommend developing a custom-made scale for this population.

Conducting the study among pharmacists already participating in a CE course of PAOFarmacie, the Netherlands Centre for Post-Academic Education in Pharmacy could have introduced selection bias. Nevertheless, because we included the *pharmacists in training*, who were 100% present in these courses, we think we were able to minimize this potential bias.

Implications and Applications from the Thesis.

What can we Learn from Others?

Pharmacists and their employers invest a lot of time and money in CE participation (an average of 40 hours/year). The effectiveness of CE in healthcare professionals, especially in the continuing education of doctors, however has often been a point of debate.⁴⁴⁻⁴⁸ Although there is evidence that CE for physicians is effective, the overall conclusions seem critical of CE. CE does improve physician performance and patient health outcomes if it is delivered in a more interactive way, a variety of teaching methods are used, and it is considered important by physicians.⁴⁴

Aylward et al.⁴⁵ have used Kirkpatrick's levels^{19,49} to describe the types of evaluation of training programs in a review study about the effectiveness of CE. They concluded that organizational and systemic factors, both enablers and barriers for implementation of knowledge into practice, are scarcely considered in the design of continuing education.^{45,49} Although CE seems to be effective, there is limited evidence that the knowledge derived through CE is sustainable and applied over time.⁴⁵ This is consistent with a recent proposal from the American Accreditation Council for Pharmacy Education (ACEP) for a revision of the global CPD model presented in chapter 1 (Figure 1) in pharmacy.⁵⁰ The proposed cycle (Figure 3 and 4) is extended with a fifth sequential stage ('apply') to an infinity-shaped cycle, which specifies the reason to learn (why) and therefore advocates that motivation in CE be considered in CE/CPD designs.

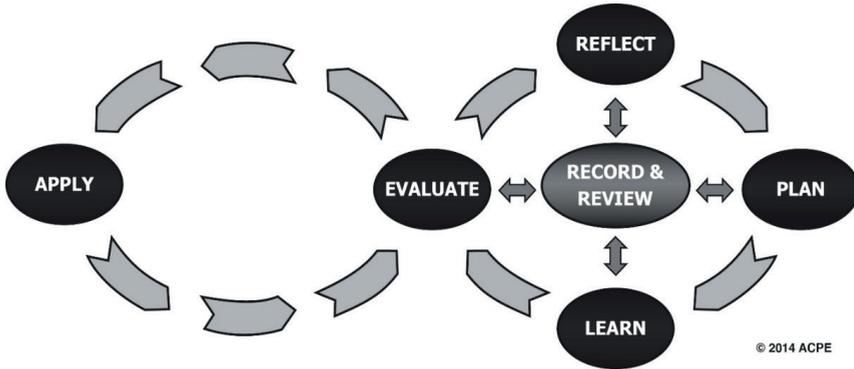


Figure 3. The Expanded CPD Cycle to an Infinity Cycle used by ACEP (used with permission from Rouse et al. 2017⁵⁰)



Figure 4. The New proposed CPD Model from the ACEP including Motivation for Additional Learning (used with permission from Rouse et al. 2017⁵⁰)

In Figure 4 the implications of the revised CPD cycle are presented. Here the roles of collaboration in learning, sharing learning experiences, learning communities, commitment to behavioral change and motivation for additional learning are emphasized to support CPD. For example, “learning peers” in

learning groups integrated in practice groups could discuss their learning plans and receive feedback from each other that could result in new ideas for learning.

To our knowledge there are no studies about the effectiveness of CE systems in pharmaceutical practice. Therefore it is important to investigate whether the current CE system for pharmacists is effective or not. Moreover, with the transition from a traditional CE to a CPD system wherein self-regulated learning skills are key,⁵¹ the findings of this study may be helpful in developing a motivating and sustainable system that promotes these skills.

CE/CPD Approaches in Global Systems for Pharmacy

In Table 2, a review of the CE/CPD systems of Australia, Canada, Japan and the United States confirms the complexity of designing an optimal CE/CPD system.^{10,52} Every CE/CPD system has its own strengths and weaknesses, but seems to have similar challenges including adherence, quality assurance of CE/CPD activities, making pharmacists understand the concept and value of CPD and dealing with pharmacists that are more focused on credits rather than the quality and relevance of CE/CPD activities.^{10,52}

Even though the same challenges are recognized in the Dutch CE system, some autonomy-supportive characteristics of other systems could inspire a new design. For example the outcome-oriented focus of the Canadian CPD system could stimulate pharmacists to engage in CE/CPD activities based on their quality and relevance rather than the quantity of credits awarded. The existence of different levels of CE/CPD activities in Australia and Japan cater to different types of motivation and aim to meet the learning needs of all pharmacists. The structure provided by a clear competency framework and the rigorous quality standards for CE/CPD providers in the Canadian

Table 2. Summary of CE/CPD Systems in Pharmacy of Australia, Canada, Japan and the United States based on the FIP Report and the PSI Report^{10,52}

| Summary of CE/CPD System | Lessons Learned & Challenges | Autonomous Oriented | Controlled Oriented |
|---|---|--|---|
| <p>Australia</p> <ul style="list-style-type: none"> • CPD since 2010; lifelong learning requirements are demonstrated by the standards and guiding principles for CPD participation developed by the Pharmaceutical Society of Australia • CPD activities on three credit levels: <i>level 1:</i> CE activities without assessment (1 credit/hour) <i>level 2:</i> CE activities where knowledge and skills are assessed (2 credits/hour) <i>level 3:</i> CE activities that implement practice-improvement (3 credits/hour) • 50% of the required amount of CPD must be level 2 or level 3 activities) • Competency standards framework to guide professional development • Enhanced focus on quality of educational events • CPD providers are accredited | <ul style="list-style-type: none"> • Mandating CPD drives compliance, but pharmacists are too focused on credits rather than considering the relevance of CPD and few Australian pharmacists assess learning needs and implement a structured learning program. • Annual credit requirement supports CE but not CPD • Some CPD providers appear to be more focused on providing the maximum number of CPD credits rather than high quality education and large volumes of educational activities are released without focusing on adult learning principles and quality of education | <ul style="list-style-type: none"> • Different levels of CPD activities to cater to different types of motivation • Structure and guidance by competency standards framework • Also quality-based | <ul style="list-style-type: none"> • Mandatory • Credit-based |

| Summary of CE/CPD System | Lessons Learned & Challenges | Autonomous Oriented | Controlled Oriented |
|---|--|---|---|
| <p>Canada</p> <ul style="list-style-type: none"> • CPD, CE and hybrid system for different provinces • Some provinces (Saskatchewan, Manitoba) are credit-based (a number of CE units per year and certain proportion must be derived from accredited CE) • Other provinces (Ontario, Quebec) use a CPD system with no specific number of CE units or type of education but with some type of competency assessment (knowledge assessment, practice-site based assessments), learning must be documented continually and self-assessment is required • Hybrid systems in Alberta and British Columbia require documentation and demonstration of learning using the CPD cycle, a specific number of not specified CE hours and self-assessment. Learning portfolios are randomly audited • A framework was developed for competency-mapped accreditation to guide professional development • CPD can be accredited on an individual program basis or via accredited providers by a defined set of standards focused on learning formats, collaboration, assessment of learning needs and evaluation of the program | <ul style="list-style-type: none"> • CPD enables a continuous learning process to reinforce competencies needed in practice • Additional guidance or mentoring is needed to apply knowledge to practice and therefore the CPD approach seems to be more embraced by those who have a mentor • Value of the CPD system is not clear for every pharmacist but when the impact for practice is recognized it is supported. Also a customized approach that allows those with specialized practice to engage in learning most beneficial to their practice helps the support of CPD • Focusing on outcome rather than CPD participation is valuable • Resources to establish CPD programs, ensure compliance and provide feedback | <ul style="list-style-type: none"> • Offering choices for accredited and non-accredited CE activities (CE system) • Outcome- instead of credit-focused (CPD system) • Need for competence and reflective skills are stimulated by self-assessment • Flexible customized path for CPD • Mentorship is considered and therefore relatedness need could be fulfilled • Structured by a framework for competency-mapped accreditation | <ul style="list-style-type: none"> • Mandatory • Credit-based |

| Summary of CE/CPD System | Lessons Learned & Challenges | Autonomous Oriented | Controlled Oriented |
|---|---|--|---|
| Japan | | | |
| <ul style="list-style-type: none"> • Lifelong learning support system (in alignment with the CPD cycle) with an online portfolio system, professional standards and guidelines and CE programs • Monitored by adequate assessment methods and measures for a portfolio-based system • Three types of CE programs: 1) general CE, 2) special training and 3) specialties programs for specialists • CE providers are accredited (some have a quality assurance system for specialties credentialing) • Currently the specifications for different level generalists and specialists are defined | <ul style="list-style-type: none"> • Application of the CPD cycle is a challenge for many pharmacists because skills and knowledge are lacking. Therefore, learning skills needed in CPD should be considered in pre-service education • Assessment of the quality of portfolios need training and time | <ul style="list-style-type: none"> • Voluntary • Different levels of CE programs to meet learning needs of all pharmacists • Guidance through a lifelong learning support system • Quality of CE is ensured by accreditation of CE providers | |
| United States | | | |
| <ul style="list-style-type: none"> • CE in all states (started in 1965 in Florida) • CPD an option in three states • Online CPD educational resources that address all four CPD stages • CE providers are accredited rather than individual CE activities • Credit-based system | <ul style="list-style-type: none"> • Even though there was evidence that pharmacists who have adopted CPD develop more reflective skills through self-assessment, develop SMART goals and participate in activities to achieve their objectives, the CPD approach has not been adopted by all states. • Reluctance to change and lacking skills and competencies required for the CPD approach is often the cause of the slow transition from CE to CPD | <ul style="list-style-type: none"> • Quality of CE is ensured by accreditation of CE providers • Also outcome-based because learning assessment is required for a CE credit | <ul style="list-style-type: none"> • Mandatory • Credit-based |

system can be considered in a new system because pharmacists would understand the value of CE/CPD and would experience high quality and motivating CE/CPD activities. And last but not least, a voluntary system like in Japan could be considered, however the optimal conditions for assessing the quality of the professionals (e.g. knowledge assessment, portfolio audits etc.) needs further investigation.

CE/CPD Approaches in Pharmacists and other Healthcare Professionals in the Netherlands

Healthcare professionals in the Netherlands including pharmacists, general practitioners, dentists and physical therapists are expected to meet requirements for their working experience (a minimum number of working hours per week is defined) and for CE/CPD to renew their license.^{33,53-61} In the next table (Table 3) the requirements for CE/CPD are summarized for community pharmacists, dentists, general practitioners and physical therapists.^{33,53-61} The quality assurance of the system for dentists, general practitioners and physical therapists is noticeably more rigorous than the system for the pharmacists. CE activities are not only accredited along themes, but also based on the didactic format. Moreover the CE/CPD activities of dentists and general practitioners are also accredited based on the quality of the teacher. Some CE providers of general practitioners and physical therapists also get an institutional accreditation based on positive evaluations of the learners, a minimum of CE activities (e.g. 10) organized for a certain period of time consecutively (e.g. three years) and demonstrating that they provide quality courses / activities.⁶¹ This type of quality assurance might be worth considering in the pharmacists' system.

General practitioners seem to have the most mature system of professional development compared to community pharmacists, dentists and physical therapists. Recently, the CPD

Table 3. Summary of the CE/CPD System of Dutch Healthcare Professionals^{32,53-61}

| Healthcare Professional | Summary of CE or CPD Requirements | Competency Framework | Quality Assurance | Trends |
|------------------------------|--|----------------------|---|--|
| Community Pharmacists | <ul style="list-style-type: none"> • Mandatory • CE: credit-based (40 credits/year) • 10-50 credits for self-assessment hours in 5 years | CanMEDS | <ul style="list-style-type: none"> • Peer reviewed accreditation of CE activities based on mainly themes • Accreditation of assessments based on Miller's pyramid | Acknowledgment of Community Pharmacists Specialists calls for high quality CE and transition to CPD |
| Dentists | <ul style="list-style-type: none"> • Mandatory • CE: credit-based and assessment of recorded hours spent on professional literature (240 hours in 5 years) • CE includes accredited activities (structured and individual) and peer meetings (120 credits in 5 years; 50% from accredited activities) | CanMEDS | <ul style="list-style-type: none"> • Peer reviewed accreditation of CE activities by a party that demonstrates quality assurance • Additional requirements for teachers/experts • Assessment portfolio for professional literature | |
| General Practitioners | <ul style="list-style-type: none"> • Mandatory • CPD (personal learning plans) (40 credits per year only accredited activities) • Self-assessment with accredited CPD tool • External quality evaluation (every 5 years) with accredited system | CanMEDS | <ul style="list-style-type: none"> • Accreditation CE activities based on themes, didactics and quality of teachers • Some CE providers get institutional accreditation • Evaluation of CPD cycle with trained peers • External evaluation with trained peers | Transition: CPD approach with a cyclical evaluation of performance will be fully implemented in 2019 |
| Physical Therapists | <ul style="list-style-type: none"> • Mandatory • CE credits depend on parts of the register (min 120 and max 280 credits in 5 years) | | <ul style="list-style-type: none"> • Accreditation of CE activities based on themes, didactic aspects and organizational aspects • Some CE providers get institutional accreditation | |

approach was adopted and will be implemented in 2019 for the general practitioners.⁵⁹ Pharmacists could consider the do's and don'ts before implementing a similar CPD approach.

Recommendations for a Motivating, Vitalizing and Sustainable CE/CPD System

"Designing a motivating, vitalizing and sustainable CE/CPD system starts with the acknowledgement that autonomy-supportive pathways will lead to better outcomes."

-Tjin A Tsoi et al. 2017-

An important challenge described in several case studies was the absence of considering adult learning principles in CE/CPD activities.^{10,62-65} In adult learning it is important to emphasize the value of the relevance of learning for one's own life.⁵⁷ Furthermore, adult learners are characterized as self-directed, self-motivated and independent learners and prefer interactive learning and learning immediately applicable to their daily practice.⁶³⁻⁶⁵ A conducive learning environment seems to be as important as what is taught and shared⁶⁶ and therefore creating a correct learning climate is essential.⁶⁵ It is not surprising to see that the conditions for adult learning can be traced back to the Self-Determination Theory. In other words, if the BPN (autonomy, perceived competence and relatedness) are considered in the design of CE/CPD activities, the conditions for adult learning could be met easily.

Basically, two levels need to be considered in the redesign of a motivating CE/CPD system.

1. At the level of the regulations

The autonomy-supportive approach should be adopted in the design of a new CE/CPD system. Regulators should reconsider the design of the system. A mandatory system for relicensure of healthcare professionals is required by law in the Netherlands.

However, the challenges of a mandatory system should be mapped and the most autonomy-supportive path should be followed.

An optimal structure with choices for learners should be introduced in the CE/CPD system. This structure could consist of an integrative approach reflected in a connected curriculum or could be more visibly based on the composed competency framework of the Dutch pharmacists.⁶⁷ Although the Dutch pharmacists' competency framework is mentioned in the regulations of accreditation, there seems to be no evident connection with accredited CE activities. The structure should clearly explain the added value to the pharmacists and make clear what is expected of the pharmacists.

CE providers should be critically selected and accredited to ensure only the best quality CE. Are the providers capable of developing motivating CE activities? Are they looking at education from a didactic point of view? How are their CE activities evaluated by the pharmacists? Is the developmental process of CE activities based on a quality (Plan-Do-Check-Act) cycle?

Provide a learning support system with integrated tools for self-assessment, quality feedback, portfolio and audits for the pharmacists to facilitate self-regulated learning skills needed for an effective CPD cycle.

If credits are considered a measure of the outcome of CE, then CE activities should be given different numbers of credits based on the Australian system. The more challenging a CE activity, the more credits are gained per hour. In this way the credits can be used to indicate the difficulty of a task and not to measure CE participation. The next step could be an outcome-based system with assessments of knowledge and practice based on the Canadian CPD system.

Last but not least, collaboration between CE providers and pharmacists' associations is essential to designing and implementing a motivating CE/CPD system.

2. At the level of the CE activities

Motivation should be considered when developing new CE activities and an autonomy-supportive approach⁵⁻⁸ should be adopted for adult learners.⁶²⁻⁶⁶ For example, a theme that is interesting and practice-based should be chosen and teachers should be selected and trained according to the autonomy-supportive concept so they can learn how to design a CE activity in a motivating way and how the BPN and learning needs of pharmacists can be met.

Quality tools/platforms should be chosen to develop tailored (blended) learning journeys with different levels in activities. This customized approach can prevent the frustration of competence. Optimal challenges should be integrated in the tasks of the activities.

Recommendations for Future Research

The findings of the thesis do not answer all the questions necessary to understand all the motivational issues of the Dutch CE climate for pharmacists. Follow-up research has been planned in the postgraduate pharmacy training context.

Research questions that have been identified for future studies are:

1. What factors in CE/CPD increase AM and what factors decrease CM?
2. What factors in CE/CPD frustrate the BPN of pharmacists?
3. Can this study be reproduced in other contexts, e.g. the US, Japan, Australia, to compare the impact of the different system characteristics on pharmacists' motivation and educational outcomes?

4. What happens with the dynamics of pharmacists' motivation if we follow the pharmacists for a longer period of time (5 years)?
5. Can we find evidence for the stimulation of AM through autonomy-supportive CE activities with intervention studies at the situational level?
6. How does pharmacists' motivation at the situational level influence motivation at the contextual level and vice versa?
7. How is the professional development of pharmacists related to performance and patient outcomes?

To conclude, we would like to invite the regulators (“Centraal College”) and pharmacists' associations (KNMP, NVZA and NIA) to rethink the criteria and regulations for the current CE system for pharmacists in the Netherlands based on our recommendations. Furthermore, the universities could prioritize and stimulate more research in (postgraduate) pharmaceutical education. This could lead to a high quality and sustainable CPD system for pharmacists in the Netherlands that motivates and energizes them to provide good patient care.

REFERENCES

1. KNMP. *Opleiding en herregistratie openbaar apothekers*. Available at: <https://www.knmp.nl/professie/opleiding-en-her-registratie/openbaar-apothekers> Accessed March 2017.
2. NVZA. *Herregistratie ziekenhuisapothekers*. Available at: <http://nvza.nl/voor-professionals/herregistratie-ziekenhuisapothekers/>. Accessed March 2017.
3. CanMEDS. *Canadian Medical Education Directions for CanMEDS*. 2005 CanMEDS framework. Available at: http://www.royalcollege.ca/portal/page/portal/rc/common/documents/canmeds/resources/publications/framework_full_e.pdf Accessed March 2017.
4. Ryan RM, Deci EL. *Self-Determination Theory: Basic psychological needs in motivation, development, and wellness*. 2017.
5. Reeve J, Jang H, Carrell D, Jeon S, Barch J. Enhancing students' engagement by increasing teachers' autonomy support. *Motiv Emot*. 2004;28(2):147-169.
6. Niemiec CP, Ryan RM. Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. *School Field*. 2009;7(2):133-144.
7. Vansteenkiste M, Simons J, Lens W, Sheldon KM, Deci EL. Motivating learning, performance, and persistence: the synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *J Pers Soc Psychol*. 2004;87(2):246.
8. Kusurkar RA, Croiset G, Ten Cate OTJ. Twelve tips to stimulate intrinsic motivation in students through autonomy-supportive classroom teaching derived from self-determination theory. *Med Teach*. 2011;33(12):978-982.
9. Guay F, Ratelle CF, Chanal J. Optimal learning in optimal contexts: The role of self-determination in education. *Can Psychol/Psychol Can*. 2008;49(3):233.
10. International Pharmaceutical Federation. *Continuing Professional Development/Continuing Education in Pharmacy: Global report*. The Hague, Netherlands: International pharmaceutical Federation; 2014. Available at: https://www.fip.org/files/fip/PharmacyEducation/CPD_CE_report/FIP_2014Global_Report_CPD_CE_online_version.pdf

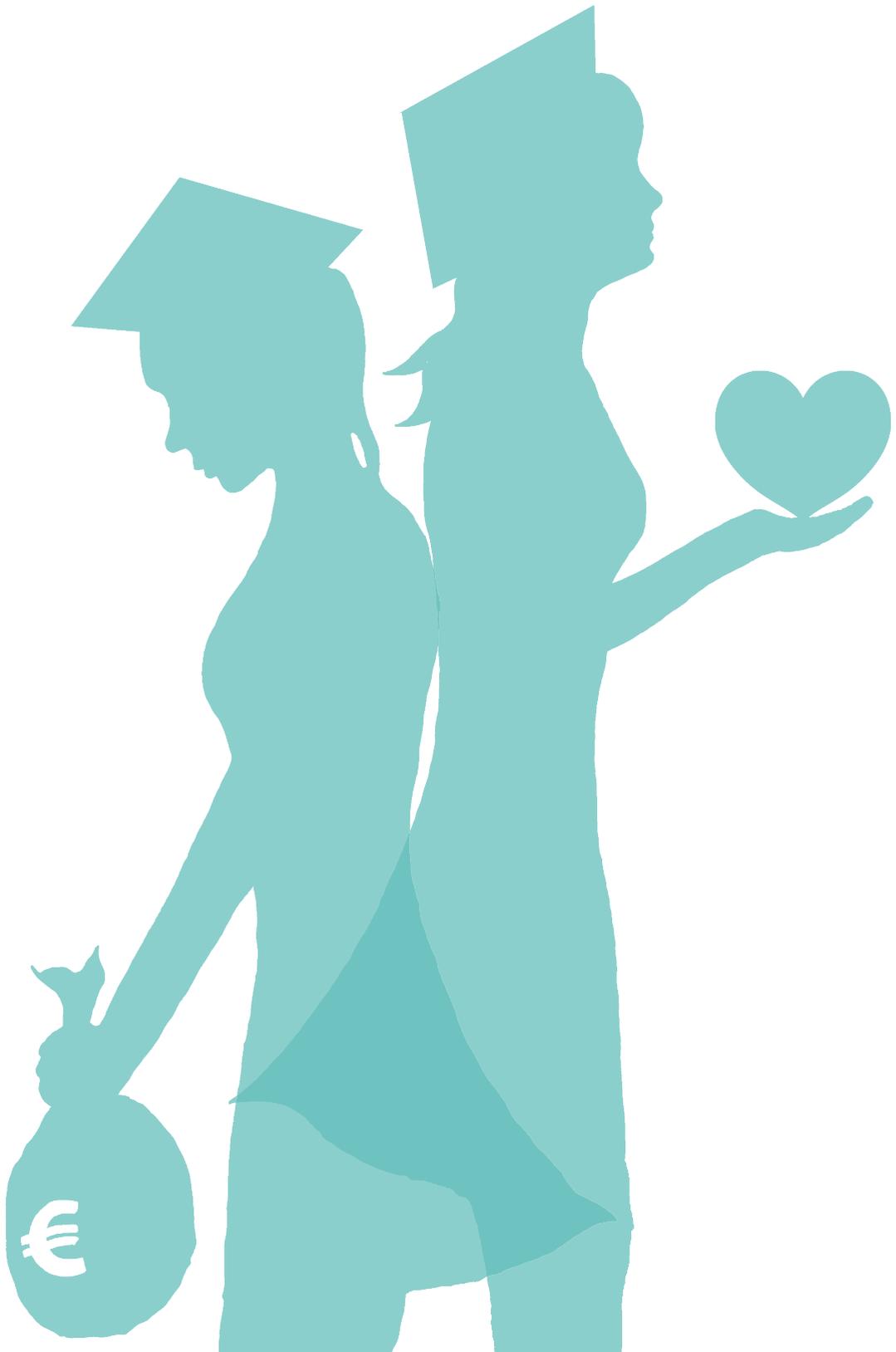
11. McConnell KJ, Delate T, Newlon CL. Impact of continuing professional development versus traditional continuing pharmacy education on learning behaviors. *J Am Pharm Assoc.* 2012;52(6):742-752.
12. McConnell KJ, Newlon CL, Delate T. The impact of continuing professional development versus traditional continuing pharmacy education on pharmacy practice. *Ann Pharmacother.* 2010;44(10):1585-1595.
13. Dopp AL, Moulton JR, Rouse MJ, Trewet CB. A five-state continuing professional development pilot program for practicing pharmacists. *Am J Pharm Educ.* 2010;74(2):28.
14. Donyai P, Herbert RZ, Denicolo PM, et al. British pharmacy professionals' beliefs and participation in continuing professional development: a review of the literature. *Int J Pharm Pract.* 2011;19:290-317.
15. Austin Z, Marini A, Glover NM, Croteau D. Continuous professional development: a qualitative study of pharmacists' attitudes, behaviors, and preferences in Ontario, Canada. *Am J Pharm Educ.* 2005;69(1-5):25.
16. Driesen A, Leemans L, Baert H, et al. Flemish community pharmacists' motivation and views related to continuing education. *Pharm World Sci.* 2005;27:447-452.
17. Namara KPM, Duncan GJ, McDowell J, et al. Community pharmacists' preferences for continuing education delivery in Australia. *J Contin Educ Health Prof.* 2009;29:52-57.
18. Power A, Johnson BJ, Diack HL, et al. Scottish pharmacists' views and attitudes towards continuing professional development. *Pharm World Sci.* 2008;30:136-143.
19. Kirkpatrick DL. Evaluation of training. In: R. L. Craig, ed. *Training and development handbook: A guide to human resource development.* New York: McGraw Hill, 1976.
20. Ten Cate O, Snell L, Mann K, Vermunt J. Orienting teaching toward the learning process. *Acad Med.* 2004;79(3):219-228.
21. Ratelle CF, Guay F, Vallerand RJ, Larose S, Senécal C. Autonomous, controlled, and amotivated types of academic motivation: A person-oriented analysis. *J Educ Psychol.* 2007;99(4):734.
22. Vansteenkiste M, Sierens E, Soenens B, Luyckx K, Lens W. Motivational profiles from a self-determination perspective: The quality of motivation matters. *J Educ Psychol.* 2009;101(3):671.

23. Kusurkar RA, Croiset G, Galindo-Garré F, Ten Cate O. Motivational profiles of medical students: association with study effort, academic performance and exhaustion. *BMC Med Educ.* 2013;13(1):87.
24. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol.* 2000;55(1):68.
25. Ryan RM, Frederick C. On energy, personality, and health: Subjective vitality as a dynamic reflection of well-being. *J Pers.* 1997;65(3):529-565.
26. Vansteenkiste M, Ryan RM. On psychological growth and vulnerability: Basic psychological need satisfaction and need frustration as a unifying principle. *J Psychother Integr.* 2013;23(3):263.
27. McCombs BL. Motivation and lifelong learning. *Educ Psychol.* 1991;26(2):117-127.
28. Black AE, Deci EL. The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Sci Educ.* 2000;84(6):740-756.
29. Ryan RM, Connell JP. Perceived locus of causality and internalization: examining reasons for acting in two domains. *J Pers Soc Psychol.* 1989;57(5):749.
30. Deci EL, Koestner R, Ryan RM. A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. 1999.
31. Deci EL, Ryan RM, Koestner R. The pervasive negative effects of rewards on intrinsic motivation: Response to Cameron. *Rev Educ Res.* 2001;71(1):43-51.
32. KNMP. *Regelgeving Accreditatie Deskundigheidsbevordering Openbare Farmacie Commissie van Deskundigen.* Available at: <https://www.knmp.nl/downloads/regelgeving-accreditatie-deskundigheidsbevordering-openbare-farmacie-1.pdf> Accessed March 2017.
33. KNMP. *Regelgeving Accrediatie Deskundigheidsbevordering Ziekenhuis-apothekers (NVZA).* Available at: <https://www.knmp.nl/downloads/regelgeving-accreditatie-deskundigheidsbevordering-ziekenhuisapothekers-nvza.pdf/view> Accessed March 2017.
34. Tjin A Tsoi SLN. Kwaliteit boven Kwantiteit. *Pharm Weekbl.* 2016;151(24):19.

35. Deci EL, Ryan RM. *Handbook of self-determination research*. University Rochester Press; 2002.
36. Shanafelt TD, Boone S, Tan L, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med*. 2012;172(18):1377-1385.
37. Dyrbye LN, Shanafelt TD. Physician burnout: a potential threat to successful health care reform. *Jama*. 2011;305(19):2009-2010.
38. VVAA. Quickscan “Bezieling in de zorg”. Available at: http://www.beroepseer.nl/images/stories/documenten/samenvatting_onderzoek_zorgprofessionals_vvaa_2014.pdf Accessed March 2017.
39. Vallerand RJ, Pelletier LG, Blais MR, Briere NM, Senecal C, Vallieres EF. The Academic Motivation Scale: A measure of intrinsic, extrinsic, and amotivation in education. *Educ Psychol Meas*. 1992;52(4):1003-1017.
40. Guay F, Ratelle CF, Roy A, Litalien D. Academic self-concept, autonomous academic motivation, and academic achievement: Mediating and additive effects. *Learn Individ Differ*. 2010;20(6):644-653.
41. Ratelle CF, Guay F, Vallerand RJ, Larose S, Sénécal C. Autonomous, controlled, and amotivated types of academic motivation: A person-oriented analysis. *J Educ Psychol*. 2007;99(4):734.
42. Grouzet FM, Otis N, Pelletier LG. Longitudinal cross-gender factorial invariance of the Academic Motivation Scale. *Struct Equ Modeling*. 2006;13(1):73-98.
43. Fairchild AJ, Horst SJ, Finney SJ, Barron KE. Evaluating existing and new validity evidence for the Academic Motivation Scale. *Contemp Educ Psychol*. 2005;30(3):331-358.
44. Cervero RM, Gaines JK. Effectiveness of continuing medical education: updated synthesis of systematic reviews. *Chicago: Accreditation Council for Continuing Medical Education*. 2014.
45. Aylward S, Stolee P, Keat N, Johncox V. Effectiveness of continuing education in long-term care: a literature review. *Gerontologist*. 2003;43(2):259-271.
46. Forsetlund L, Bjorndal A, Rashidian A, et al. Continuing education meetings and workshops: effects on professional practice and health care outcomes. *Cochrane Database Syst Rev*. 2009;2(2).

47. Bloom, BS. Effects of continuing medical education on improving physician clinical care and patient health: a review of systematic reviews. *Int J Technol Assess Health Care*. 2005;21(03):380-385.
48. Davis D, O'Brien MAT, Freemantle N, Wolf FM, Mazmanian P, Taylor-Vaisey A. Impact of formal continuing medical education: do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or health care outcomes? *Jama*. 1999;282(9):867-874.
49. Bates, R. A critical analysis of evaluation practice: the Kirkpatrick model and the principle of beneficence. *Eval Program Plann*. 2004;27(3):341-347.
50. Rouse MJ, Trewet CB, Janke K. *Extending Continuing Professional Development to Advance Pharmacy Practice submitted to J Am Pharm Assoc*. 2017.
51. White CB, Gruppen LD, Fantone JC. Self-Regulated Learning in Medical Education. *Understanding medical education: Evidence, theory and practice*. 2010:201-211.
52. PSI. *The Review of International CPD Models* report of the *Pharmaceutical Society of Ireland* (PSI). July 2010. Available at: https://www.google.nl/search?q=52.%09The+Review+of+International+CPD+Models+report+of+the+Pharmaceutical+Society+of+Ireland+&ie=utf-8&oe=utf-8&client=firefox-b&gfe_rd=cr&ei=aPHhWO_dIYjVXseulugD Accessed March 2017.
53. KNMT. *Regeling tandheelkundig specialismen*. Available at: https://www.knmt.nl/sites/default/files/20160401_regeling_tandheelkundige_specialismen.pdf. Accessed March 2017.
54. *Registratienorm tandartsen*. Available at: <https://tandartsregister.nl/wp-content/uploads/2016/12/Registratienorm-tandartsen-2007.pdf> Accessed March 2017.
55. *Registratiereglement*. Available at: <https://tandartsregister.nl/wp-content/uploads/2016/12/Registratiereglement-2016.pdf> Accessed March 2017.
56. *Tandartsen register*. Available at: [https://tandartsregister.nl/wp-content/uploads/2016/12/Criteria Individuele-activiteiten-2014.pdf](https://tandartsregister.nl/wp-content/uploads/2016/12/Criteria%20Individuele-activiteiten-2014.pdf) Accessed March 2017.

57. *Reglement erkenning deskundigheidsbevordering*. Available at: <https://tandartsregister.nl/wp-content/uploads/2016/12/Reglement-Erkenning-van-deskundigheidsbevordering-2012.pdf> Accessed March 2017.
58. *Reglement accreditatie van deskundigheidsbevordering*. Available at: <https://tandartsregister.nl/wp-content/uploads/2016/12/Reglement-Accreditatie-van-deskundigheidsbevordering-2012.pdf>. Accessed March 2017.
59. KNMG. *Regelgeving Opleiding herregistratie carrier*. Available at: <https://www.knmg.nl/opleiding-herregistratiecarriere/cgs/regelgeving/huidige-regelgeving.htm> Accessed March 2017.
60. Verenso. *Regelgeving Accreditatie Bureau Cluster 1*. Available at: <http://www.verenso.nl/assets/Uploads/Downloads/Accreditatie/REGELGEVING-ACCREDITATIE-BUREAU-CLUSTER-1-ABC1-2016.pdf>. Accessed March 2017.
61. KNGF. *Beleidsorgaan Centraal Kwaliteitsregister Fysiotherapie Beleidsdocument*. Available at: <https://www.kngf.nl/binaries/content/assets/kngf/onbeveiligd/vakgebied/kwaliteit/ckr/bock-beleidsdocument-2015-ingaande-1-januari-2015.pdf> Accessed March 2017.
62. Keller JM. Strategies for stimulating the motivation to learn. *Perf Improv*. 1987;26(8):1-7.
63. Kaufman DM. ABC of learning and teaching in medicine: Applying educational theory in practice. *Br Med J*. 2003;326(7382):213.
64. Knowles MS. *The modern practice of adult education* (Vol. 41). New York: New York Association Press; 1970.
65. Kwa SK. How do adults learn? *Malays Fam Physician*. 2012;2(1):2.
66. Hutchinson L. Educational environment. *Br Med J*. 2003;326(7393):810.
67. KNMP. *Opleidingsplan Specialisme Openbare Farmacie*. Available at: <https://www.knmp.nl/downloads/opleidingsplan-specialisme-openbare-farmacie-2015.pdf> Accessed April 2017



CHAPTER 8

Appendix

English Summary

Samenvatting

Dankwoord

Curriculum Vitae

List of Publications, Presentations and PhD courses

”Designing a motivating, vitalizing and sustainable CE/CPD system starts with the acknowledgement that autonomy-supportive pathways will lead to better outcomes.”

–Tjin A Tsoi et al. 2017-

SUMMARY OF THE THESIS

Poor performance, such as making medication errors, endangers patient safety. Healthcare professionals need to take responsibility for their professional development in order to ensure patient safety. Lack of motivation seems to be one of the most important barriers for healthcare professionals to engage in professional development; therefore it is important to investigate their motivation for Continuing Education (CE) and Continuing Professional Development (CPD). As stated by Self-Determination Theory (SDT), the desirable type of motivation, i.e. autonomous motivation (AM), is associated with satisfying the Basic Psychological Needs (BPN) of individuals and the less desirable type, i.e. controlled motivation is associated with thwarting BPN. Regulators and CE providers can help health professionals develop their self-regulated learning skills needed for effective CPD by investigating and fulfilling their BPN.

In this thesis we aimed to enhance our understanding of pharmacists' motivation in CE. Different topics ranging from motivation as a dependent and an independent variable, the dynamics of motivation and structural relations between BPN, motivation and outcomes like well-being and lifelong learning adaptability are covered.

Chapter 1 sets the stage for the research conducted in the thesis. The terminology of CE, CPD and lifelong learning is explained and the development of CE and CPD in the international pharmacy workforce is described. Although CPD started in the eighties, thirty years later poor performance among healthcare professionals is still an issue. Implementing an effective CE/CPD system seems challenging because of important barriers such as a lack of motivation.

An overview of the learning context of Dutch pharmacists is provided and an explanation is given for the motivation

lens used in this thesis. Motivation is investigated from a Self-Determination Theory (SDT) perspective, the theoretical framework of which is further elaborated in this chapter. Two main types of motivation are described: 1) Autonomous Motivation (AM) that is desirable and comes from within a person and 2) Controlled Motivation (CM) that is less desirable and is externally driven. Finally, a conceptual model of the role of BPN and motivation in CE/CPD, well-being, professional performance and patient care is presented. This chapter concludes with broad research questions followed by specific research questions and an outline of the thesis.

Chapter 2 unravels the motivational profiles found in an exploratory study conducted with 425 pharmacists. Based on their AM and CM scores, different profiles were found with K-means cluster analysis. The profiles that emerged were a good quality profile (GQL- with high AM and low CM), a high quantity profile (HQT- with high AM and high CM), a poor quality profile (PQL- with low AM and high CM) and a low quantity profile (LQT- with low AM and low CM). The profiles differed in their demographic characteristics. The highest percentage of *females* (35.5%), *hospital pharmacists* (42.5%) and *pharmacists who worked more than 10 years* (34.4%) belonged to the GQL profile. The highest percentage of *community pharmacists* (34.5%), *pharmacists who worked less than 10 years* (36.2%) and *pharmacists in training* (37.3%) belonged to the HQT profile. The highest percentage of *pharmacy owners* (36.4%) belonged in the LQT profile. These findings call for the development of different educational formats to cater to all types of motivation, instead of the one-size-fits-all approach of the traditional CE system.

Chapter 3 presents the results of an exploratory study of possible factors that could influence pharmacists' CE participation. Apart from demographic factors, we wanted to

know if motivation could also affect the CE participation of pharmacists. CE participation was measured using the central portfolio which is monitored by the Royal Dutch Pharmaceutical Society (KNMP). From this portfolio we extracted every CE activity for a period of 11 months starting from the day the participants completed the questionnaire. Only the activities with prior requested accreditation and identity number were included in the data. The dependent variable was defined as the total CE hours spent in 11 months. With multiple regression analysis we studied potential predictor variables like gender, pharmacy school, work experience, traineeship and motivation. Relative Autonomous Motivation (RAM), which indicates how AM and CM are related to each other within an individual by combining and weighing the autonomous regulations positively and the controlled regulations negatively, was found to be a positive predictor for CE hours spent. Furthermore, *pharmacy school*, *work experience* and *traineeship* seem to influence pharmacists' participation in CE. Because we found a negative relationship between AM and CE hours spent, we conclude that the current CE system is not conducive to stimulating the AM of pharmacists for CE. From additional interviews conducted by telephone we think that factors fulfilling autonomy and competence are absent in the current CE system, which explains the negative relationship.

Chapter 4 describes the dynamics of pharmacists' motivation in CE over a period of 21 months. Data were collected at three different time points using the Academic Motivation Scale (AMS). Latent Growth Modelling was used to analyze the developmental trajectory of changes in pharmacists' motivation. Although we found that both AM and CM increased (AM: Intercept=3.36, Slope=0.07; $p=0.029$; CM: Intercept=1.89, Slope=0.20; $p<0.001$) over time, RAM decreased (Intercept=4.20, Slope=-0.38; $p=0.002$). This suggests that the less desirable type of motivation (CM) increases at the expense of the desirable

type of motivation (AM). The exact causes of these changes are not yet clear, however designing an autonomy-supportive CE system could help to preserve the desirable type of motivation (AM).

Chapter 5 aims to determine a structural pathway from basic psychological needs (BPN) to learning outcomes. In this study we administered four questionnaires namely, the Basic Psychological Need Satisfaction and Frustration Scale (BPNSFS), the Academic Motivation Scale (AMS), the Vitality Scale (VS) and the Lifelong Learning and Adaptability (LLA) construct. Based on earlier literature and theory, we constructed a hypothesized model. Structural Equation Modelling (SEM) was used as an analytical approach to discover significant pathways from BPN to LLA. Our data did not fit the entire hypothesized model; however, we could find evidence for a part of the model. We used a stepwise approach to fit two acceptable models. The first model contained only controlled motivation (CM), vitality and LLA and demonstrated a direct negative association of CM with vitality (-0.55 , $p < 0.001$), a direct positive association of vitality with LLA (0.29 , $p < 0.001$) and thus an indirect negative association between CM and LLA. The second model contained the pathway BPN frustration-CM-Vitality-LLA and from this analysis emerged an important negative effect of the BPN directly on vitality (-1.61 , $p < 0.001$). Furthermore, frustration of BPN is directly and positively associated with CM (0.88 , $p < 0.001$) and vitality is directly and positively associated with LLA (0.38 , $p < 0.001$). In this study we found evidence which suggests that BPN are important predictors of well-being and better learning outcomes (LLA). Regulators and CE providers could use these insights to collaborate on designing autonomy-supportive CE/CPD.

Chapter 6 recommends best practices for setting up CE/CPD based on the findings of the earlier studies. This chapter

discusses lessons learned from research on pharmacists' motivation in CE/CPD and elaborates on the principles of autonomy-supportive teaching. These principles can be translated into best practices and tips for a motivating system for CE/CPD for healthcare professionals, which can help these healthcare professionals regain their passion for their work.

In **chapter 7** a roadmap is proposed to design an autonomy-supportive CE/CPD system in the Netherlands. This chapter combines the findings of all the research studies in this thesis to arrive at deeper insights about motivation and CE/CPD. Next, the strengths and limitations of the thesis are discussed.

The effectiveness of CE/CPD for healthcare professionals and insights for adult learning are considered in light of efficacy and motivation. A summary of other global and national CE/CPD systems is presented with the intention to arrive at the do's and don'ts of other systems. The general discussion concludes with a proposal for a motivating, vitalizing and sustainable CE/CPD system. In the recommendations two levels for autonomy-support in a CE/CPD system are suggested. The *first* level describes an autonomy-supportive approach at the level of regulations for the CE/CPD system. Collaboration between regulators, pharmacists' associations and CE providers at this level could help design CE/CPD regulations that stimulate AM and decrease CM. For example, an integrative approach with CE activities at different degrees of difficulty could create personal learning journeys, an outcome-based system could be considered rather than a credit-based system and a learning support system could be designed to facilitate self-regulated learning skills. The *second* level describes the implementation of autonomy-support in the design of CE activities. At this level teachers / experts need to be professionalized in *autonomy-supportive teaching and learning*, e.g. encourage active participation of students (i.e. health professionals), identify

their needs and stimulate them to take more responsibility for their learning. Quality assurance of CE providers and CE activities could help to achieve motivating CE/CPD.

In the last section, suggestions are presented to develop further research to pursue and elaborate on the understanding of pharmacists' motivation and BPN in a CE/CPD system in the near future.

Concluding Remarks

The evidence found in this thesis seems to provide insights into the pathways that influence CE participation, lifelong learning and adaptability and thus the professional development of Dutch pharmacists. We invite the regulators ("Centraal College") and pharmacists' associations for community, hospital and industrial pharmacists (KNMP, NVZA and NIA) to rethink the criteria and regulations for the current CE system for pharmacists in the Netherlands based on our recommendations. Furthermore, the Universities could prioritize and stimulate more research in the direction of (postgraduate) pharmaceutical education. This could lead to a high quality and sustainable CPD system for pharmacists in the Netherlands that motivates and energizes them to provide good patient care.

SAMENVATTING

Slecht presteren door zorgprofessionals, zoals het maken van medicatiefouten, brengt de patiëntenzorg in gevaar. Continue professionele ontwikkeling van zorgprofessionals met behulp van nascholing kan bijdragen aan de veiligheid van de patiënt. Echter, gebrek aan motivatie blijkt één van de belangrijkste barrières te zijn voor het volgen van nascholing door zorgprofessionals. Onderzoek naar de motivatie voor nascholing en professionele ontwikkeling is daarom van groot belang en vormde de aanleiding voor dit proefschrift.

De *Self-Determination Theory* (SDT), een goed gevalideerde motivatietheorie in diverse domeinen als sport, organisaties en onderwijs, onderscheidt verschillende typen motivatie. Het wenselijke type motivatie, de autonome motivatie (AM) ontstaat van binnen of van buiten maar is geïnternaliseerd. De onwenselijke motivatie, gecontroleerde motivatie (CM) ontstaat van buiten en is niet geïnternaliseerd. AM wordt bereikt door het vervullen van psychologische basisbehoeften van individuen en is daardoor geassocieerd met welbevinden en betere (leer)uitkomsten. CM wordt daarentegen geassocieerd met de frustratie van deze basisbehoeften en veroorzaakt vaker klachten als *burn-out* en faalangst.

Regelgevers, wetenschappelijke verenigingen en aanbieders van nascholing kunnen zorgprofessionals ondersteunen in het ontwikkelen van competenties die nodig zijn om levenslang *up-to-date* en *fit-for-practice* te blijven. Onderzoek naar hun motivatie en hoe hun psychologische basisbehoeften vervuld kunnen worden, kan bijdragen aan de verbetering van hun professionele ontwikkeling en daardoor aan een veilige patiëntenzorg.

In dit proefschrift beogen we de kennis over de motivatie van apothekers voor nascholing te verrijken. Verschillende

onderwerpen, variërend van motivatie als afhankelijke en onafhankelijke variabele, de verandering van motivatie in de tijd en structurele relaties tussen psychologische basisbehoeften, motivatie en uitkomsten als vitaliteit en het effect van leren worden behandeld.

Hoofdstuk 1 geeft de setting weer waarin het onderzoek is uitgevoerd. Begrippen als *continue educatie* (CE), *continue professionele ontwikkeling* (CPD) en *lifelong learning* worden uitgelegd en de trends in CE en CPD op internationaal farmaceutisch gebied worden beschreven. CPD is reeds gestart in de tachtiger jaren en, dertig jaar later, blijkt het nog steeds lastig te zijn om daar goed vorm aan te geven bij zorgprofessionals. Het implementeren van een effectief CE/CPD systeem heeft te maken met uitdagingen als gebrek aan motivatie van zorgprofessionals voor nascholing.

Dit hoofdstuk geeft een overzicht van het Nederlands onderwijssysteem voor farmacie en de onderbouwing voor de keuze voor motivatie als uitgangspunt voor dit onderzoek. Motivatie wordt benaderd vanuit het perspectief van de SDT, een theoretisch raamwerk dat uitgebreid wordt toegelicht in het hoofdstuk. Twee hoofdtypen motivatie worden beschreven: 1) de wenselijke autonome motivatie (AM), waarvan de oorsprong vanuit een individu zelf komt en 2) de onwenselijke gecontroleerde motivatie (CM) die vanuit externe druk wordt veroorzaakt. Tot slot wordt een conceptueel model voorgesteld waarin de rol van motivatie en de psychologische basisbehoeften in CE/CPD worden geschetst en hoe zich dit verhoudt tot patiëntenzorg. Dit hoofdstuk eindigt met de algemene hoofdonderzoeksvragen gevolgd door de meer specifieke onderzoeksvragen en een korte bespreking van de indeling van het proefschrift.

In **Hoofdstuk 2** wordt in een exploratief onderzoek bekeken hoe het gesteld is met de motivatie van de apothekers voor nascholing. De kwaliteit en de kwantiteit van de motivatie van 425 apothekers wordt met behulp van *K-means* cluster analyse in kaart gebracht. Gebaseerd op de scores van de apothekers op AM en CM zijn vier verschillende motivatieprofielen onderscheiden. De vier profielen zijn: 1) een wenselijk kwaliteitsprofiel (*good quality* (31.8%) met een hoge score op AM en een lage score op CM), 2) een hoog kwantiteitsprofiel (*high quantity* (26.8%) met een hoge score op zowel AM als CM), 3) een onwenselijk kwaliteitsprofiel (*poor quality* (22.6%) met een lage score op AM en een hoge score op CM) en 4) een laag kwantiteitsprofiel (*low quantity* (18.6%) met lage scores op zowel AM als CM). De profielen worden onderzocht op verschillen in demografische kenmerken. In de *good quality* groep zijn de hoogste percentages van *vrouwen* (35.5%), *ziekenhuisapothekers* (42.5%) en *apothekers met meer dan 10 jaar werkervaring* (34.4%) te vinden. De *high quantity* groep bestaat uit de grootste groep van *openbaar apothekers* (34.5%), *apothekers met minder dan 10 jaar werkervaring* (36.2%) en *apothekers in opleiding* (37.3%). *Apotheekeigenaren* (36.4%) kwamen het meest voor in de *low quantity* groep. Deze uitkomsten impliceren dat er verschillende soorten nascholingscursussen ontwikkeld zouden moeten worden, rekening houdend met de verschillende soorten motivatieprofielen van apothekers. Dit betekent dat er meer maatwerk nodig is in plaats van de *one-size-fits-all* aanpak die op dit moment gebruikelijk is bij nascholingscursussen.

Hoofdstuk 3 presenteert de resultaten van een exploratieve studie naar factoren die mogelijk een rol spelen bij de deelname van apothekers aan nascholing. Los van de demografische kenmerken waren we bovenal geïnteresseerd in de rol die motivatie speelt bij de deelname aan nascholing. Om *deelname aan nascholing* vast te stellen hebben we het

centrale portfoliosysteem (PE-online) van de Koninklijke Nederlandse Maatschappij der Pharmacie (KNMP) geraadpleegd. Uit het portfoliosysteem hebben we vanaf het moment dat de deelnemende apothekers de vragenlijst hadden ingevuld gedurende 11 maanden elke gevolgde nascholingsactiviteit genoteerd. Alleen de activiteiten met een accreditatienummer zijn geïncorporeerd in het onderzoek. Het totaal aantal uren dat de apothekers in 11 maanden besteed hadden aan dit type activiteiten is in dit onderzoek gedefinieerd als afhankelijke variabele. Met multiële regressie analyse hebben we onderzocht welke variabelen - zoals *geslacht*, *de universiteit waar men opgeleid was*, *de werkervaring*, *het wel of niet in opleiding zijn* en hun *motivatie*-voorspellend zijn voor de deelname aan nascholing. Relatieve Autonome Motivatie (RAM), ofwel de verhouding tussen AM (positieve bijdrage) en CM (negatieve bijdrage) binnen een individu, blijkt een positieve voorspeller te zijn voor het aantal gevolgde nascholingsuren door apothekers. Ook blijken factoren als *de universiteit waar men opgeleid was*, *de werkervaring* en *het in opleiding zijn*, de deelname van apothekers aan nascholing te beïnvloeden. De gevonden negatieve relatie tussen AM en het aantal nascholingsuren dat apothekers volgen, impliceert dat het huidige nascholingsstelsel voor apothekers de AM van apothekers niet stimuleert. Aanvullende telefonische interviews geven als mogelijke verklaring dat in het huidige stelsel een gebrek lijkt te zijn aan factoren die de basisbehoeften autonomie en competentie vervullen.

Hoofdstuk 4 beschrijft de dynamiek van de motivatie van apothekers voor nascholing. In een longitudinale studie van 21 maanden zijn op drie verschillende momenten data verzameld met behulp van de *Academic Motivation Scale (AMS)*. *Latent Growth Modelling* is gebruikt als analyse methode om het veranderingstraject van de motivatie van apothekers in beeld te brengen. Als uitkomst hebben we een toename gevonden

van zowel AM als CM (AM: Intercept=3.36, Slope=0.07;p=0.029; CM: Intercept=1.89, Slope=0.20;p<0.001) en een afname van RAM (Intercept=4.20, Slope=-0.38;p=0.002) in de tijd. Deze bevindingen suggereren een toename van het onwenselijke type motivatie (CM) ten koste van het wenselijke type motivatie (AM). Hoewel de exacte oorzaak voor deze veranderingen nog niet geheel duidelijk is, zou het ontwerpen van een autonomie-stimulerend nascholingsstelsel de groei van het wenselijke type motivatie (AM) kunnen faciliteren.

Hoofdstuk 5 heeft tot doel te onderzoeken hoe het vervullen of frustreren van de psychologische basisbehoeften (BPN) leidt tot welke leeruitkomsten. Voor deze studie vulden apothekers vier vragenlijsten in die de vervulling/frustratie van hun psychologische basisbehoeften (BPN), hun motivatie voor nascholing (AM en CM), hun vitaliteit en hun aanpassingsvermogen in de nascholingscontext meten (LLA).

Op basis van eerdere literatuur en onderzoeken waarin SDT is gebruikt hebben we een hypothetisch model opgesteld. Om dit model te testen is gebruik gemaakt van *Structural Equation Modelling* (SEM) als analyse methode. Het voorgestelde model werd deels bevestigd na het in kaart brengen van significante structurele relaties tussen de verschillende variabelen. Hiervoor hebben we een stapsgewijze aanpak toegepast waarbij twee modellen werden gevonden met een acceptabele *model fit*. Het eerste model bestaat uit de variabelen CM, vitaliteit en LLA en laat een directe negatieve associatie zien tussen CM en vitaliteit (-0.55, p<0.001), een directe positieve associatie tussen vitaliteit en LLA (0.29, p<0.001) en een indirecte negatieve associatie tussen CM en LLA. Het tweede model bestaat uit de variabelen frustratie van BPN, CM, vitaliteit en LLA en laat zien dat er een belangrijke directe negatieve associatie is tussen de frustratie van BPN en vitaliteit (-1.61, p<0.001). Bovendien heeft de frustratie van BPN in het tweede model

een directe en positieve associatie met CM (0.88, $p < 0.001$) en is vitaliteit direct positief geassocieerd met LLA (0.38, $p < 0.001$). De resultaten van deze studie suggereren dat BPN belangrijke voorspellers zijn voor vitaliteit en leeruitkomsten als LLA. Door een nascholingsysteem te ontwikkelen dat voorkomt dat er frustratie optreedt in de psychologische basisbehoeften van apothekers, zou de onwenselijke motivatie (CM) voor nascholing beperkt kunnen worden. Hierdoor zou het verlies van vitaliteit en slechtere leeruitkomsten voorkomen kunnen worden.

In **Hoofdstuk 6** worden aanbevelingen gedaan voor het ontwikkelen van een nascholingsysteem voor zorgprofessionals die gebaseerd zijn op inzichten uit eerdere literatuur en de onderzoeken die we uitgevoerd hebben naar de motivatie van apothekers voor nascholing. Ook de principes voor autonomie-stimulerend onderwijs worden uitgebreid beschreven. Deze principes zijn vertaald naar praktische tips voor een motiverend nascholingsysteem voor zorgprofessionals, waardoor ze hun passie voor hun werk kunnen hervinden.

In **Hoofdstuk 7** wordt een voorstel gedaan voor het ontwikkelen van een motiverend en vitaliserend nascholingsysteem voor apothekers in Nederland. In dit hoofdstuk worden alle resultaten besproken en worden diepere inzichten over motivatie voor nascholing en professionele ontwikkeling beschreven. De effectiviteit van nascholing voor zorgprofessionals wordt bediscussieerd en principes vanuit het volwassenenonderwijs worden aangehaald in relatie tot motivatie en effectiviteit. Daarna worden de sterktes en zwaktes van het onderzoek beschreven.

Het hoofdstuk bevat een overzicht van andere nationale en internationale nascholings- en professionele ontwikkelings-systemen. Dit overzicht kan aanknopingspunten bieden voor verbetering van het Nederlandse systeem voor apothekers.

Tot slot wordt in de aanbevelingen op twee niveaus beschreven hoe de autonomie-stimulerende principes toegepast zouden kunnen worden in Nederland. Aanbevelingen op het *eerste* niveau beschrijven autonomie-stimulerende principes op het gebied van regelgeving en eisen van het nascholingsstelsel. Op dit niveau is samenwerking tussen de regelgevers, apothekersverenigingen en aanbieders van nascholing cruciaal voor het stimuleren van AM en het verlagen van CM. Voorbeelden van maatregelen op dit niveau zijn: 1) een integrale aanpak voor nascholing met verschillende niveaus in nascholing waarmee persoonlijke leertrajecten mogelijk zijn, 2) een systeem dat gericht is op uitkomsten (toetsing) in plaats van op gevolgde uren en 3) het bieden van een goede structuur die de ontwikkeling van zelfregulerende competenties (opstellen van leerplannen, ontvangen van constructieve feedback, toepassen van reflectie) van apothekers optimaal faciliteert. Het *tweede* niveau beschrijft de implementatie van autonomie-stimulerende principes in de ontwikkeling van nascholingsactiviteiten. Op dit niveau is het belangrijk om de docenten te professionaliseren op het gebied van deze principes. Voorbeelden hiervan zijn: het stimuleren van actieve deelname en het identificeren van de leerbehoeften van de cursist, maar ook het stimuleren van het nemen van de eigen verantwoordelijkheid in het leerproces. Het monitoren en bijstellen van de kwaliteit van aanbieders van nascholing op dit gebied zou behulpzaam kunnen zijn voor een motiverend systeem.

Het hoofdstuk eindigt met nieuwe onderzoeksvragen om onze kennis op het gebied van de motivatie van apothekers en hun psychologische basisbehoeften voor nascholing uit te breiden.

Tot slot

De uitkomsten van dit proefschrift geven ons inzicht in de wegen die bewandeld zouden kunnen worden om de nascholing

voor apothekers, leeruitkomsten en hun professionele ontwikkeling te verbeteren met behulp van principes uit de motivatietheorie SDT. We willen de regelgevers (Centraal College) en de apothekersverenigingen (KNMP, NVZA en NIA) uitnodigen om de criteria en regelgeving van het huidige nascholingsstelsel voor apothekers te heroverwegen. Bovendien zouden we de universiteiten willen vragen meer prioriteit te geven aan onderzoek naar (postacademisch) farmaceutisch onderwijs. Dit zou kunnen leiden tot een duurzaam nascholingsstelsel van hoge kwaliteit voor de apothekers in Nederland, dat hen motiveert en stimuleert om goede patiëntenzorg te verlenen.

BEGRIPPEN

Autonome Motivatie is motivatie voor een activiteit die je leuk of interessant vindt of waarvan je de waarde geïnternaliseerd hebt. Een voorbeeld van het laatste is dat je aan de verkeersregels houdt, omdat je inziet dat het veiliger is.

Gecontroleerde Motivatie is motivatie die vanuit externe druk of interne druk ontstaat. Een voorbeeld hiervan is dat je gaat studeren omdat je ouders dat belangrijk vinden en je een goed voorbeeld wil zijn voor je jongere broers of zussen.

Good Quality Motivatieprofiel is het motivatieprofiel waarbij een individu hoog scoort op autonome motivatie en laag scoort op gecontroleerde motivatie voor een bepaalde activiteit.

High Quantity Motivatieprofiel is het motivatieprofiel waarbij een individu hoog scoort op beide typen motivatie (autonoom en gecontroleerd) voor een bepaalde activiteit.

Poor Quality Motivatieprofiel is het motivatieprofiel waarbij een individu laag scoort op autonome motivatie en hoog op gecontroleerde motivatie voor een bepaalde activiteit.

DANKWOORD

Het allereerste moment dat ik overwoog om een promotie-traject te starten herinner ik mij nog goed. Als ik toen op een vragenlijst mijn motivatie voor dit traject had moeten scoren was ik waarschijnlijk uitgekomen op een hoge score voor gecontroleerde motivatie. Met andere woorden: mijn motivatie kwam oorspronkelijk van buitenaf omdat mijn werkomgeving van mij verwachtte dat ik me meer zou verdiepen in het farmaceutisch onderwijs. Maar ook mijn score op autonome motivatie zou toen hoog zijn geweest, omdat ik zelf inzag dat PAOFarmacie erbij gebaat zou zijn met het verwerven van expertise op dit gebied. Volgens mijn eigen onderzoek zou ik dan een *high quantity* motivatieprofiel hebben. Bekend is ook dat een hoge gecontroleerde motivatie kan leiden tot slecht psychologisch welbevinden, waaronder *burn-out*...

Na twee jaar worstelen met de onderzoeksvraag verloor ik bijna de moed, doordat ik naar mijn gevoel niet verder kwam in een onderzoeksgebied dat voor zowel Andries als Ton nieuw was. Mijn motivatiebalans sloeg door naar de gecontroleerde kant en ik herkende het *poor quality* motivatieprofiel bij mezelf. Mijn autonome motivatie was tot een dieptepunt gezakt en mijn gecontroleerde motivatie was erg hoog doordat de druk van buitenaf in mijn beleving steeds groter werd en mijn psychologische basisbehoeften, “het competent voelen” en het “ergens bij horen”, gefrustreerd werden. Samen met andere factoren (want volgens *Murphy’s law* komt pech tenslotte nooit alleen) heeft dat ervoor gezorgd dat ik in een situatie terecht kwam waarin ik minder functioneerde, zowel fysiek als psychisch. Ik had een *burn-out*.

Mijn herstel begon nadat ik in een warm bad terecht kwam bij de onderzoeksgroep van Gerda en Rashmi. Ik zal hen altijd dankbaar zijn dat ik zo hartelijk verwelkomd ben bij VUmc. Ik begin daarom ook als eerste met het bedanken van Rashmi.

Rashmi, I am forever grateful for your invitation in your research group. You brought my work to a higher level and with your critical questions and remarks you gave me the competence to think like an independent researcher. My basic psychological need for relatedness was completely satisfied by you and the whole research group. Without your mentoring I could not have finished this project in the way that I had pictured it. Many thanks!

Op een gedeelde eerste plaats komt Ton, mijn leidinggevende bij PAOFarmacie en mijn hoofdpromotor. Beste Ton, heel veel dank voor je geloof in me en de steun die je me geboden hebt om dit project waar te maken. Als jij niet als een blok achter me gestaan had, had ik dit nooit kunnen realiseren. Ook het feit dat je ervoor openstond dat ik mijn promotieteam mocht uitbreiden met Rashmi en Gerda heeft ontzettend geholpen. Altijd even geduldig en toch de puntjes op de i zetten. Je hebt me vertrouwen gegeven en dat heeft geresulteerd in een proefschrift waar we allemaal trots op kunnen zijn.



-Favoriete quote van Gerda-

Andries en Gerda, mijn dank aan jullie is ook groot. Andries, omdat je me vanaf het eerste moment begeleidt hebt en om jouw enthousiasme voor statistiek. Ik ben nog steeds geen

statisticus, maar dankzij jouw geduld heb ik er steeds meer van opgestoken en begon ik het op het eind zelfs stiekem een beetje leuk te vinden. De vanzelfsprekendheid waarmee je jezelf op een tweede plek hebt gezet toen ik intensief door Rashmi werd begeleid is bewonderenswaardig. Ook je luisterend oor heb ik heel erg gewaardeerd. Dank daarvoor!

Gerda, de avonden bij jou thuis in Bilthoven waren voor ons promotieteamoverleg een goede uitkomst omdat alle ‘normale’ werktijden van vijf drukke mensen steeds zo gauw gevuld waren. Bedankt voor je gastvrijheid en goede zorgen. Je hebt een grote rol gespeeld in het faciliteren van dit project door open te staan voor samenwerking en kritisch mee te kijken naar de grote lijn van het onderzoek. Ook jouw steun en moeite heb ik erg gewaardeerd.

De bestuursleden van PAOFarmacie die akkoord gingen met mijn promotietraject wil ik ontzettend graag bedanken. Het feit dat jullie me in de gelegenheid hebben gesteld om PAOFarmacie en mezelf verder te ontwikkelen is fantastisch.

De medewerkers van PAOFarmacie die me gesteund hebben in dit traject wil ik graag bij naam noemen: Karin, Hans, Rebecca en Saskia. Karin, bedankt voor al het werk dat je verricht hebt naast je gewone takenpakket. Hans, jouw geestelijke steun was onmisbaar en ook je steun tijdens mijn *sabbatical* waardeer ik heel erg. Rebecca, bedankt voor het op weg helpen en het verzamelen van de data. Sas, jij bedankt voor het ‘er zijn’, die onvoorwaardelijke loyaliteit is fijn. Ik moet nog steeds die lunchafspraak met Ray plannen....

Mijn onderzoekscollega's: Anita, Anouk, Cora, Marianne, Stéphanie en Ulviye wil ik ook bedanken. Het was heerlijk om bij jullie te vertoeven en het ‘erbij horen’ te ervaren. Eindelijk was ik geen directeur, maar gewoon een mede-onderzoeker. Heerlijk! Jullie hebben me echt het gevoel gegeven dat ik bij

jullie ‘thuis’ was. En alle feedback die jullie hebben gegeven op mijn stukken was *on point!* Dames van de Canadagroep, fijn dat ik bij jullie kon ‘uithuilen’. Restaurant Chi is heel blij met ons en wij met hen!

Zonder de hulp van Rutchanna, Sandra, Simone en Xynthia had ik het zeker niet gered. Rutchanna, bedankt voor de data-verzameling. Sandra, jouw kwaliteit van data verzamelen en het meedenken in de methode van analyseren was heel fijn. Daarmee heb je me heel erg geholpen. Heel veel succes met je eigen PhD-traject. Simone, fijn dat je kon inspringen als Sandra niet kon. Xynthia, ik heb heel veel gehad aan jouw manier van denken en de integriteitsspiegel die je me steeds voorhield. Allen dank hiervoor!

Ook Janneke Wilschut, statisticus van de VU, dank voor het mee analyseren van en reflecteren op mijn SEM-data. Het heeft me zeker geholpen om bewust een bepaalde analysemethode te kiezen.

De KNMP wil ik bedanken en met name Wilma van der Spoel, die me geholpen heeft de data in PE-online te verzamelen.

Scheltus van Luijk bedankt voor het modereren van de focusgroepen. Zonder deze kwalitatieve data hadden we geen richting kunnen geven aan dit onderzoek.

Marnix en Tamara, als lid van ons pioniersclubje heb ik de eer als eerste mijn proefschrift te verdedigen. Bedankt voor jullie gezelligheid! We zullen doorgaan. Veel succes gewenst met het afronden van jullie proefschrift.

Last but not least wil ik mijn thuisfront bedanken. Natuurlijk als eerste mijn ouders. Lieve Ma, ik ben heel blij dat je erbij kan zijn vandaag, ik weet zeker dat Pa meekijkt en meegeniet. Bedankt voor alle offers die jullie gebracht hebben om mij de

gelegenheid te geven om mezelf te ontwikkelen in Nederland. Zonder jullie offers was mijn carrière heel anders gelopen. Ik hoop dat je een beetje trots op me bent.

Joan, bedankt dat je de ‘orga’ op je wilde nemen en Laura en Amy daarbij wilde ondersteunen. *Thanks!*

Ook mijn andere zussen en broers (Anne, Patty, Arthur, Evert en Pearl) wil ik bedanken. En natuurlijk voor diegene die er vandaag bij zijn: *ik waardeer het heel erg dat jullie speciaal zijn overgekomen om met mij deze mijlpaal te vieren!*

Lieve Wim, bedankt voor je onvoorwaardelijke liefde en steun. Het valt niet mee om met zo’n gedreven vrouw getrouwd te zijn en jezelf steeds op de tweede plaats te zetten. Toch hou je het al meer dan 30 jaar met me vol. Hier ben ik blij om en onze kinderen Laura en Amy ook. Zonder jou had ik het niet voor elkaar gekregen. Liefde!

En dan mijn twee grote liefdes Laura en Amy. Zo trots en blij dat jullie mijn paranimfen zijn. Door jullie ben ik een beter mens geworden. Jullie geven me zoveel vreugde (en soms verdriet) in het leven. Ik hoop dat jullie beiden zo doorgaan en ik heb er het volste vertrouwen in dat jullie een succesvol leven zullen leiden. Laura, je bent zo talentvol op allerlei fronten. Vertrouw op jezelf en het komt allemaal goed! Amy, ik herken mijn gedrevenheid in jou. Altijd serieus en gedisciplineerd aan het werk. Tegen jou wil ik zeggen: leer van mijn fouten en verlies jezelf niet uit het oog. Ik hou van jullie!

Om de cirkel rond te maken tot slot nog een aantal opmerkingen:

1. Aan het einde van mijn promotietraject was mijn autonome motivatie hoger dan mijn gecontroleerde motivatie en heb ik het *good quality* motivatieprofiel voor onderzoek.

2. Ik heb zoveel interesse gekregen in onderwijspsychologie dat ik overweeg dat als volgende stap te gaan 'studeren'.
3. Alle apothekers die meegewerkt hebben aan dit onderzoek: hartelijk bedankt voor jullie deelname. Ik hoop dat we met deze bevindingen een steentje hebben bijgedragen aan een motiverend nascholingsstelsel voor apothekers.
4. Ik wil een ieder bedanken die niet in dit dankwoord genoemd is en mij op welke manier dan ook gesteund heeft in dit traject.
5. Ik had de neiging om achter sommige zinnen een *smiley* te plaatsen, maar ik wist niet of dat wel kon in een proefschrift. 😊

CURRICULUM VITAE



Sharon Tjin A Tsoi was born in Paramaribo, the capital of Surinam on December the 2nd 1966. After the military coup in Surinam she immigrated at the age of fifteen to the Netherlands with her Mom and some of her siblings. She completed her high school education in 1985 at Visser 't Hooft lyceum (Leiden) and her Doctor of Pharmacy degree in 1992 at Utrecht University.

After working for several years as a community pharmacist, she changed her career path and started working for the Netherlands Pharmacovigilance Centre Lareb from 1998 to 2002. Her job at Lareb involved assessing adverse events reported by doctors and pharmacists and presenting and emphasizing the work of Lareb.

For a short time she worked for an organization that developed guidelines for healthcare professionals in multi-disciplinary settings.

Throughout her career she has been intrigued by teaching and learning. Even in the community pharmacy she would always try to bring pharmacy technicians/assistants and doctor's assistants together to learn from each other. Therefore, when the Netherlands Centre for Post-Academic Education in Pharmacy (PAOFarmacie) was founded she applied and was given the position of the CEO in 2003.

PAOFarmacie was founded by Auke Bult and reflects a collaboration of the Universities of Utrecht and Groningen and the pharmacists' associations of Community, Hospital and Industrial Pharmacists (KNMP, NVZA and NIA). The main goal of PAOFarmacie is to organize high quality and scholarly CE activities. During the first few years she focused on organizing the quality of the processes in the institute. From 2010 she started to investigate whether the organized CE activities really affected the knowledge and competencies of pharmacists and thus patient care. After reading scientific literature about the role of motivation in educational outcomes and the way motivation can be influenced to improve learning according to the Self-Determination Theory, she knew this was the scholarship she wanted to pursue.

In addition to conducting the theoretical research of her PhD, she always tried to apply the theory of her PhD research into practice. This resulted in a project called the *Curriculum vision of PAOFarmacie in 2020*. This vision was created in collaboration with the board of PAOFarmacie and many other institutes and experts in the field. As part of the implementation of this vision a motivating *Blended Learning* environment for Hospital Pharmacist Residents was piloted in November 2016.

Sharon hopes to learn more about Educational Psychology in the future and would like to use her expertise to support the professional development of teachers, mentors and experts in autonomy-supportive teaching.

Sharon has been married to Wim Schouten for 25 years and they have two daughters, Laura (20) and Amy (18).

LIST OF PUBLICATIONS, PRESENTATIONS AND PHD COURSES

Papers

Tjin A Tsoi SLN, de Boer A, Koster AS. Lifelong Learning: Alles draait om de Intrinsieke Motivatie. *Pharm Weekbl.* 4 juli 2014; 149-27.

Tjin A Tsoi SLN, de Boer A, Koster AS. Gender Differences in Motivation and Learning Preferences of Pharmacists in Lifelong Learning. *J Pharm Pharmacol.* 2014;2:608-615.

Tjin A Tsoi SLN, de Boer A, Croiset G, Koster AS, Kusrkar RA. Unraveling Motivational Profiles of Healthcare Professionals for Continuing Education: the Example of Pharmacists in the Netherlands. *J Cont Educ Health Prof.* 2016;36(1):46-54

Tjin A Tsoi SLN, de Boer A, Croiset G, Koster AS, Kusrkar RA. Factors Influencing Participation in Continuing Professional Development: a Focus on Motivation among Pharmacists. *J Cont Educ Health Prof.* 2016;36(3):144-150.

Tjin A Tsoi SLN. Kwaliteit boven Kwantiteit (2016) *Pharm Weekbl.* 2016;151(24):19.

Tjin A Tsoi SLN, de Boer A, Croiset G, Kusrkar RA, Koster AS. (in press). Exploring Changes in the Motivation of Dutch Pharmacists with respect to the Current Continuing Education System: a Longitudinal Approach (in press). *Am J Pharm Educ.* 2017

Tjin A Tsoi SLN, de Boer A, Croiset G, Koster AS, van der Burgt S, Kusrkar RA. How Basic Psychological Needs and Motivation affect Vitality and Lifelong Learning Adaptability of Pharmacists: a Structural Equation Model. *Under Review at Advances in Health Sciences Education.* March 2017

Tjin A Tsoi SLN, de Boer A, Croiset G, Koster AS, Kusurkar RA. Regaining Passion in Healthcare Professionals by Designing a Motivating System for Continuing Education and Continuing Professional Development. *Under Preparation*

Tjin A Tsoi SLN, de Boer A, Croiset G, Koster AS, Rouse M, Kusurkar RA. Motivating and Vitalizing Professional Development for Pharmacists. What can we Learn from Research and Others? *Under Preparation*

van der Burgt S, Kusurkar RA, Wilschut J, Tjin a Tsoi SLN, Croiset G, Peerdeman S. Motivational Profiles of Medical Specialists and the Influence on Motivation for Lifelong Learning. *Under Preparation*

van der Burgt S, Kusurkar RA, Wilschut J, Tjin a Tsoi SLN, Croiset G, Peerdeman S. Associations of Basic Psychological Needs, Work Motivation and Lifelong Learning Motivation of Medical Specialists. *Under Preparation*

Oral Presentations

Tjin A Tsoi SLN, de Boer A, Koster AS. Gender Differences in Motivation and Learning Preferences of Pharmacists in Lifelong Learning. NVMO Conference Egmond aan Zee, the Netherlands, 2013

Tjin A Tsoi SLN, de Boer A, Koster AS, Kusurkar RA. Motivation of Pharmacists for Continuing Pharmaceutical Education. Life Long Learning in Pharmacy, 10th International Conference, Orlando, USA, 2014

Tjin A Tsoi SLN, de Boer A, Koster AS, Kusurkar RA. Motivatie van apothekers in postacademisch onderwijs. Prisma Symposium, Amersfoort, the Netherlands, 2014

Tjin A Tsoi SLN, de Boer A, Croiset G, Koster AS, Kusrkar RA. An Explorative Study Unraveling Motivational Profiles of Pharmacists regarding Continuous Education. Presented by Cora Visser. AMEE Conference, Glasgow, Scotland, 2015

Tjin A Tsoi SLN, de Boer A, Croiset G, Koster AS, Kusrkar RA. Unravelling Motivational Profiles of Healthcare Professionals for Continuing Education: The Example of Pharmacists in the Netherlands. Life Long Learning in Pharmacy, 11th International Conference, Split, Croatia, 2016

Tjin A Tsoi SLN, de Boer A, Kusrkar RA, Koster AS. Exploring Changes in the Motivation of Dutch Pharmacists with respect to the Current Continuing Education system: a Longitudinal Approach. Prisma Symposium, Amersfoort, the Netherlands, 2017

Tjin A Tsoi SLN, de Boer A, Croiset G, Koster AS, Kusrkar RA. De Rol van Motivatie bij Nascholing van Apothekers. *Abstract Submitted* to NVMO Conference, Egmond aan Zee, The Netherlands, 2017

Poster Presentations

Schiffelers S, Tjin A Tsoi SLN. Quality Assurance in Pharmacy Education. Life Long Learning in Pharmacy, 9th International Conference, Helsinki, Finland 2012

Tjin A Tsoi SLN, Muller R, de Boer A, Koster AS. Heeft post-academisch onderwijs invloed op de motivatie van apothekers? NVMO Conference Egmond aan Zee, the Netherlands, 2013

Tjin A Tsoi SLN, de Boer A, Croiset G, Kusurkar RA, Koster AS. Motivational Profiles of Pharmacists in Continuous Education. Presented by Andries Koster. Pharmacy Education Conference, Prato, Italy, 2015

Tjin A Tsoi SLN, de Boer A, Croiset G, Kusurkar RA, Koster AS. Motivational Profiles of Pharmacists in Continuous Education. NVMO Conference, Rotterdam, the Netherlands, 2015

Tjin A Tsoi SLN, de Boer A, Croiset G, Koster AS, Kusurkar RA. Factors Influencing Pharmacists' Participation in Continuing Education: A Focus on Motivation among Pharmacists. SDT Conference, Victoria, Canada, 2016

Tjin A Tsoi SLN, de Boer A, Croiset G, Kusurkar RA, Koster AS. Longitudinal Changes in Autonomous and Controlled Motivation of Pharmacists in the Dutch Continuing Education System. Presented by Andries Koster. Monash Pharmacy Education Symposium, Prato, Italy, 2017. Awarded for the best poster on Education research.

Workshops

Tjin A Tsoi SLN. Blended Learning in Pharmacy. Life Long Learning in Pharmacy, 9th International Conference, Helsinki, Finland 2012

Kusurkar RA, Tjin A Tsoi SLN. Enhancing Intrinsic Motivation in Pharmacists: Using Self-Determination Theory. Docent Professionaliseringsdag georganiseerd door PAOFarmacie, Hilversum, the Netherlands, 2015

Tjin A Tsoi SLN, Croiset G, Kusurkar RA. Enhancing Intrinsic Motivation in Pharmacists: Using Self-Determination Theory. Life Long Learning in Pharmacy, 11th International Conference, Split, Croatia, 2016

PhD courses

SHE course Maastricht University October 2012

SPSS course EpidM September 2013

Analytic Storytelling graduate school February 2015

Academic English Writing graduate school December 2015

UIPS Introduction course April 2016

Introduction to Structural Equation Modelling

Summerschool Utrecht August 2016

