Internship report

PHARMACEUTICAL PROMOTION IN MEDICAL AND PHARMACY EDUCATION IN THE NETHERLANDS: READINESS FOR CURRICULUM CHANGE

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Preface and acknowledgements

This report is the result of my graduate internship for the Master's programme *Management, Policy Analysis and Entrepreneurship in the Health and Life Sciences* at the VU University Amsterdam. In my quest to find a suitable and challenging organisation to conduct the internship, I stumbled upon Health Action International (HAI). HAI is an independent network that partially works to improve the rational use of medicines, including efforts to counter the potential harmful effects of pharmaceutical promotion, also known as drug marketing. I first came into contact with pharmaceutical industry marketing during a lecture by a pharmaceutical company, which turned from providing (objective) information about innovative technologies to providing free Doppler water bottles and informing us about internship opportunities at the company. I was surprised by the effect it seemed to have on my fellow students and decided this would be interesting to research in greater detail.

My interest in pharmaceutical promotion proved to be a good match with HAI's current needs and aims, and I enjoyed the opportunity to learn more. We decided to focus on the status of, and education on, pharmaceutical promotion in both medical and pharmacy schools, since this is where future prescribers and dispensers of medications are trained. Surprisingly, no previous research had been conducted on students' and doctors' exposure and attitudes towards the pharmaceutical industry in the Netherlands. I appreciated meeting influential and interesting professionals. Their enthusiasm boosted my contribution to making a change.

I hope, through this report, to not only inform Dutch medical and pharmacy schools about faculty attitudes towards the status of education on pharmaceutical promotion, but also scientists, policy-makers and (international) healthcare organisations to the importance of rational prescribing and keeping integrity within the healthcare domain. Hopefully, this report will shed general insight into pharmaceutical promotion and, specifically, in relation to medical and pharmacy training, contribute to the existing body of knowledge to create a collective awareness of the importance of prioritising the interests of citizens and society above all else.

Thank you to everyone who made this internship possible. Firstly, I would like to thank the representatives from all the medical and pharmacy schools in the Netherlands. Thank you for taking the time to discuss your views and opinions and providing me with valuable insights. Furthermore, I would like to thank Health Action International for making me feel welcome at the office and their important role in facilitating the research. I would specifically like to thank my supervisors, Tim and Eline, for their understanding and support during difficult moments and for taking the time to provide me with valuable feedback throughout the course of the project.

For general questions, or questions about the report, please do not hesitate to contact me. I am more than willing to clarify these or help in any other way.

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Executive summary

Introduction: Despite the importance of the pharmaceutical industry, a substantial amount of pharmaceutical companies' expenditure is targeted at the promotion of pharmaceuticals in order to increase sales. This so-called pharmaceutical promotion affects, among other things, the quality, frequency and costs of prescribing, as well as the sustainability of healthcare systems, and may also result in patients receiving suboptimal care. It is therefore essential that healthcare professionals—primarily doctors and pharmacists—understand these pharmaceutical promotion strategies and have the skills to respond appropriately. However, physicians and medical students, alike, underestimate the effects of promotion on their prescribing behaviour, and receive little to no training on how to critically assess these sophisticated pharmaceutical promotion activities.

Aim: The current study aimed to identify aspects of the effects of pharmaceutical promotion that were addressed during medical and pharmacy training, either explicitly or implicitly. On top of that, faculty's readiness, divided into motivational and capability factors, to integrate education on pharmaceutical promotion in the formal curriculum was explored. This helped identify aspects that facilitate or impede change, thereby providing the opportunity for targeted recommendations to the training programmes.

Methods: A qualitative approach was chosen using semi-structured interviews with deans, education coordinators, and faculty in pharmacology/pharmacotherapy from all Dutch medical faculties (N=8) and pharmacist trainings (N=2). Potential respondents were identified from universities' websites and Health Action International's and the researcher's networks. Snowball sampling was applied to gather additional respondents. A total of 18 interviews were conducted with medical (N=14) and pharmacy (N=4) deans (N=2), education coordinators/directors (N=7) and pharmacologists/pharmacotherapists (N=13). Interviews took 50 minutes on average (SD +- 15 min). Interviews were recorded and transcribed verbatim. Open and closed coding was performed on the data.

Results: Aspects of the effects of pharmaceutical promotion are well covered in the curricula of pharmacy training in the Netherlands. In medical education, the issue is, generally, barely if at all, explicitly addressed in the formal curriculum. A lot is achieved via implicit education, including evidence-based medical training and the instilling of a critical attitude. Faculty did consider it important and appropriate to address pharmaceutical promotion and associated techniques explicitly. The main barrier for integration in the curriculum was a lack of prioritization in an overly full curriculum. Motivational factors that impeded readiness to change were a lack of time, naivety of faculty, difficulty in addressing transcending subjects, and simply forgetting the issue. Expertise to educate about pharmaceutical promotion was generally present, although it was considered difficult to provide in-depth training. If expertise was considered an impeding factor, external professionals, such as Health Action International, may be needed to complement education. Resources were available, although not knowing whether suitable education material was available, or considering the available material too extensive, could impede integration in the curriculum. The opportunity to deploy the expertise and resources is complicated by the lack of priority allocated to education about pharmaceutical promotion.

Policies limiting commercial influence on education were absent at many of the medical faculties. Furthermore, conflict of interest policies seemed limited or absent, and faculty members were often unaware of its existence and/or content. Respondents did indicate that commercial influence on education is rare and believed there are no structural shortcomings. Faculty attitudes towards industry salesmen were dismissive. Role models were considered highly important and aware of the

effects of pharmaceutical promotion, but did not communicate this explicitly to students. The norm seems to be shifting and pharmaceutical promotion has become less problematic than it used to be, although influence is still widespread.

Discussion: Pharmaceutical promotion is a neglected subject in undergraduate medical and pharmacy training and not offered structurally, which has also been found in other studies. Although the biasing effects of pharmaceutical promotion were acknowledged by medical faculty leaders, teaching about it was not considered a priority. Instead, principles of evidence-based medicine and scientific rigour were thought to provide medical students with a sufficiently critical attitude towards pharmaceutical promotion. This may be caused by an underestimation of the severity of the biasing effects of pharmaceutical promotion. Pharmaceutical promotion should, however, be embedded more structurally and over the breadth of the curriculum. Large variation was observed between medical schools, which is at least partially due to the dedication of individual professors. Large variations were also observed between medical faculties and pharmacy training.

It seems that no strong messages or values are conveyed to students and faculty members by Dutch UMCs surrounding interaction with the pharmaceutical industry and pharmaceutical promotion. This becomes clear from an apparent absence of strong policies that limit or eliminate contact with the industry, a lack of inclusion of the topic in examinations and evaluations, and the limited resources allocated to education. As such, the 'hidden' curriculum does not reinforce education activities on pharmaceutical promotion.

Role models and medical opinion leaders should communicate to students to not engage with the industry, but do not carry out this stance explicitly despite being aware of it. There may be a relation between the attitudes and stances of role models and the extent to which the issue is educated, as becomes clear from pharmacy training. This corresponds to faculty's role as change agents as change blockers.

Conclusion: Large differences were observed between pharmacy and medical education. Pharmaceutical promotion is rarely and not structurally addressed in the formal curriculum of medical schools, and large differences were observed between medical faculties as to which aspects were addressed. Although most universities try to develop students critically and teach evidence-based medicine, it is important that the issue becomes structurally integrated in curricula and that pharmaceutical promotion is addressed 'just in time', when students also become increasingly exposed to promotion. Additionally, pharmaceutical promotion should be addressed in graduate training and included in continuing medical education.

This study focused on faculty members' attitudes. To complement the present study, future research should focus on students' attitudes and exposure to pharmaceutical promotion. Furthermore, document analysis of universities' conflict of interest policies should be conducted to reveal shortcomings and act on these.

List of abbreviations

Aios	-	Doctor in specialist training
AMSA	-	American Medical Student Association
BIG-register	-	Register of healthcare professionals
CGR	-	Foundation for the Code for Pharmaceutical Advertising
CME	-	Continuing medical education
EBM	-	Evidence-based medicine
ERB	-	Ethical review board
FTO	-	Pharmacotherapy counselling
GP	-	General practitioner
GR	-	Health Council of the Netherlands
HAI	-	Health Action International
HCPs	-	Healthcare professionals
IGZ	-	Dutch Healthcare Inspectorate
KAG/KOAG	-	Inspection Board for the Public Promotion of Medicinal Products
CBG	-	Medicines Evaluation Board
KNAW	-	Royal Netherlands Academy of Arts and Sciences
KNMG	-	Royal Dutch Medical Association
NHG	-	Dutch College of General Practitioners
NVMO	-	Netherlands Association for Medical Education
PP	-	Pharmaceutical promotion
VWS	-	Dutch Ministry of Healthcare, Sports and Wellbeing
WHO	-	World Health Organisation

1. Introduction

Medicines are an essential aspect of contemporary healthcare systems and pharmaceutical companies play an indispensable role in the development, production and distribution of new, cost-effective medications. However, at the same time, the pharmaceutical industry also has interests that do not align with the needs of the population, such as the responsibility to their shareholders to maximise profits and returns on investments (Meijerink, van Berck-Woerdman, Bosma *et al.,* 2008; Spurling *et al.,* 2010). The Dutch Council for Public Health and Health Care (RVZ, Raad voor de Volksgezondheid en Zorg) stresses the importance of balancing the interest of the pharmaceutical industry with that of the general public and society (Meijerink et al., 2008). It is in the best interest of both parties that pharmaceutical companies make profit, as to be able to develop novel medications. However, this may not exceed the public's interest of safe, affordable and best-in-class medicines.

Since pharmaceutical companies' primary responsibility is maximising profits to their shareholders, a substantial amount of pharmaceutical companies' expenditure is spent on the promotion of medicines in order to increase sales (Mintzes, Laing & Reed, 2009; Norris, Herxheimer, Lexchin & Mansfield, 2005; Spurling, Mansfield, Montgomery *et al.,* 2010). This is referred to as pharmaceutical promotion and broadly defined by the World Health Organization (WHO) as: *"All informational and persuasive activities by manufacturers, the effect of which is to induce the prescription, supply, purchase and/or use of medicinal drugs"* (Norris *et al.,* 2005). Overall, certain negative effects are associated with promotion, including a lower prescribing quality, a higher prescribing frequency and higher costs due to the prescribing of branded over generic medicines (Spurling *et al.,* 2010). Furthermore, promotion may negatively impact the costs and sustainability of healthcare systems, result in a loss of patients' trust in healthcare professionals and the healthcare system as a whole, and most important, result in patients receiving suboptimal care (Mintzes *et al.,* 2009; Norris *et al.,* 2005; Spurling *et al.,* 2010; Wazana, 2000).

To minimize the negative effects and ensure rational and responsible prescribing practices, it is considered essential that healthcare professionals (HCPs) understand the marketing strategies and associated (psychological) mechanisms used by the pharmaceutical industry. In addition, healthcare professionals should have the necessary skills to appropriately respond to pharmaceutical promotion (Mintzes *et al.,* 2009; Mintzes, 2005; Norris *et al.,* 2005). However, it seems that this understanding and critical attitude is not always present, potentially resulting in the aforementioned negative effects. This becomes clear from the recurring phenomenon where physicians and medical students tend to underestimate the effect promotion has on their prescription behaviour. Multiple studies have reported 'blind spots' in physicians' and medical students' attitudes towards their own susceptibility to pharmaceutical promotion, in which they consider themselves less prone to the influence of pharmaceutical sales representatives than their colleagues (HAI, 2016; Jahnke, Kremer, Schmidt, Kochen and Chenot, 2014; Mansfield *et al.,* 2006; Mintzes, 2005; Norris *et al*., 2005; Spurling *et al*., 2010). Furthermore, students who are more frequently exposed to pharmaceutical promotion also believed they are more capable of dealing with exposure and, at the same time, have more favourable attitudes towards pharmaceutical influence (Jahnke *et al.,* 2014; Lea *et al.*, 2010). This 'cognitive bias' indicates that healthcare professionals and students alike do not sufficiently possess the required knowledge and skills.

It would be desirable to address pharmaceutical promotion during formal undergraduate education, considering HCPs' and students' apparent lack of knowledge and skills regarding pharmaceutical promotion. Addressing this in formal education could be beneficial for a number of reasons. One reason is that education is the primary learning period, ensuring a certain minimum level of knowledge, skills and competencies for all students. Additionally, both pharmacy and medical

students are exposed to pharmaceutical promotion already early in their studies, showing a gradual increase over the course of education (Lea *et al.,* 2010).

The purpose of the present study is to provide recommendations to medical and pharmacy schools on areas that require additional attention to minimalize potentially negative effects of pharmaceutical promotion and ensure ethical and professional behaviour of future physicians and pharmacists. It will do so by determining what content is being formally taught to students regarding pharmaceutical promotion, taking into account both explicit and more implicit aspects. The study also aims to determine factors that facilitate or impede medical and pharmacy schools' integration of an understanding of pharmaceutical promotion in the curricula, making use of the construct of 'readiness to change'. The study takes a qualitative approach using interviews with deans, vice deans, education coordinators, and, primarily, senior pharmacology/pharmacotherapy faculty members.

Reading guide

The report is structured as follows: The second chapter provides background information about pharmaceutical promotion, specifically in regard to medical and pharmacist training. The third chapter provides a theoretical basis using two constructs: 1) organizational readiness to change and 2) the hidden curriculum and the informal curriculum that co-exist with the formal curriculum. The conceptual model is based on these theories and presented in chapter four. Also, the research questions are provided in this chapter. The fifth chapter details the methodology used, justifies it and describes how data is gathered and analysed. The results are presented in the sixth chapter. Here, the status of pharmaceutical promotion in the formal medical curriculum is discussed first, which funnels into readiness to change the formal medical curriculum. Hereafter, the results section deals with the status of education on pharmaceutical promotion in pharmacy schools' curricula. The discussion is used to answer the sub-questions identified in the research and to compare the present findings with the literature. Also, the impact of the present study is discussed, and suggestions for future research and recommendations are made. Chapter eight provides a conclusion that answers the main research question.

2. Pharmaceutical promotion in context

Contextual factors relating to the current study are discussed in this chapter. First, the size, scope and potential effects of pharmaceutical promotion on public health and prescribing practices are discussed. Hereafter, the literature addressing pharmaceutical promotion in relation to medical and pharmacy education is discussed, including students' exposure and attitudes, and educational initiatives. This is considered important contextual information for the reader to understand the necessity of integrating pharmaceutical promotion in the medical and pharmacy curricula.

2.1 The pharmaceutical industry and promotion

In the United States (US), expenditures on prescription drugs have increased from $53 per person to $831 per person between 1980 and 2010, representing an increase of well over 1000 percent (Dave, 2013). In the US, healthcare expenditures on prescription drugs has been one of the fastest growing components of total healthcare costs, with a share of about 10 percent. The European Commission (EC) published an inquiry into the pharmaceutical sector in 2009. Here, amongst others, the EC estimated that, in 2007, an average of €430 per person was spent on medicines, and that this number is likely continue to increase (EC, 2009). The documents highlights the importance of providing European patients with safe, effective and affordable medicines, and simultaneously creating a business environment that stimulates research, boosts innovation and supports the pharmaceutical industry's competitiveness.

Pharmaceutical companies invest large sums of money in inventing, developing, producing, marketing, and distributing new drugs. Considering the high investments and long development trajectories, patent protection is essential in enabling these companies to achieve return on investment and make profit. To achieve this, pharmaceutical companies operate highly complex marketing techniques and allocate significant parts of their total expenditure to promotion (Sah and Fugh-Berman, 2013). A 2009 inquiry by the EC into the global pharmaceutical industry estimated that industry spending on research and development (R&D) in the period 2000–2007 to be 17 percent of total revenue, while spending on marketing on average accounted for 23 percent of total revenue (EC, 2009). Multiple studies have estimated that pharmaceutical spending on R&D is often, at best, equal to marketing spending (COM rapport SEO onderzoek, Gagnon and Lexchin, 2008; Sah and Fugh-Berman, 2013). However, the exact numbers are not known since pharmaceutical companies' financial reports do not disclose what exactly is shared under R&D or marketing, one example being phase-IV trials. Nonetheless, it is clear that a substantial part of pharmaceutical companies' expenditure is spent on promotion.

Pharmaceutical promotion has been defined by the WHO as: *"All informational and persuasive activities by manufacturers, the effect of which is to induce the prescription, supply, purchase and/or use of medicinal drugs"* (Norris *et al.,* 2005).

Clearly, pharmaceutical promotion covers a wide array of activities. One of the main questions surrounding pharmaceutical promotion by firms in healthcare markets is whether the marketing techniques raise 'selective', brand-specific demand, versus 'primary', industry-wide demand (Borden, 1942; Dave, 2013). This corresponds with the informational and persuasive activities by manufacturers in the definition. The pharmaceutical industry claims to provide scientific and educational information to HCPs through appropriate marketing, which is critical in creating product awareness, ensuring patients have access to essential medicines and that these are used correctly (Spurling *et al.,* 2010). Furthermore, industry argues that promotion educates providers on potential

treatment options, establishes communication between HCPs and patients, and can expand appropriate treatment for undertreated conditions (Dave, 2013). This is consistent with the 'informative view' on promotion. However, it has been demonstrated that 'scientific' and educational information provided by pharmaceutical companies is often biased in favour of the companies' product—for example, by not reporting all the risks (Spurling *et al.*¸ 2010; HAI, 2016). Multiple studies and opponents have argued that pharmaceutical companies operate aggressive marketing techniques to promote its products and exert an undesirable influence on the prescribing habits of doctors (Damen-van Beek and van Eijk, 2013; PWC, 2008). Furthermore, studies point out that the significant spending on marketing activities raises drug costs, that it has anti-competitive effects, and may actually harm consumers (Dave, 2013; Spurling *et al.,* 2010).

The Dutch College of General Practitioners (NHG) has expressed that healthcare professionals should not see pharmaceutical sales representatives. The Dutch Institute for Rational Use of Medicine (IVM) supports this view and advises general practitioners to exercise restraints in accepting gifts, in following sponsored courses, and in making use of pharmaceutical industry support (Damen-van Beek and van Eijk, 2013). Legislation has been adopted in the Netherlands, and the industry applies self-regulation (see Box 1). Despite the legislation and self-regulation, the researchers estimate half of all Dutch general practitioners see pharmaceutical representatives, and a substantial proportion accepts gifts and attend industry-sponsored education (Damen-van Beek and van Eijk, 2013).

Box 1: Legislation on promotion and self-regulation in the Netherlands.

In the Netherlands, pharmaceutical marketing requirements have been laid out in Articles 83–96 of the 2007 Medicines Act (Geneesmiddelenwet, the Act)[1]. Additionally, the Dutch Healthcare Inspectorate (Inspectie voor de Gezondheidszorg, the IGZ) has issued policy rules that elaborate on the Act in regard to the provision of inducements and administrative penalty. Furthermore, the Foundation for the Code for Pharmaceutical Advertising ('Stichting Code Geneesmiddelenreclame', the CGR) has been established. The Royal Dutch Medical Association (KNMG) and the Royal Dutch Pharmacists Association (KNMP) follow this code, and others.

The CGR has established a code of conduct for pharmaceutical advertising ('Gedragscode Geneesmiddelenreclame', the Code). The Code has a legal basis under the supervision of the healthcare inspectorate and executed by the Inspection Board for the Public Promotion of Medicinal Products since 2012 ('de Keuringsraad, KAG/KOAG)[2,3]. In the Code, rules for nonfinancial and financial relations have been stipulated, notably in regard to gift-giving (maximum €50), financial support at meetings, pay for service, and sponsorships[4]. (See footnotes for details)

Furthermore, the Transparancy Register ('Transparantieregister Zorg'), established in 2012, provides insight into financial relationships between pharmaceutical companies and, among others, individual healthcare providers, physicians and partnerships of HCPs via a publicly available database[5]. The Netherlands is the first country globally to publicize financial relations between the pharmaceutical industry and healthcare organizations and HCPs. In 2015, a total of 14,000 relationships have been reported, which amounted to €51.6 million. 80 percentof this amount consisted of financial relationships between pharmaceutical companies and healthcare organisations, mainly the sponsoring of events (58%) and sponsoring of projects (32%). About €8.6 million, the remaining 20 percent, was spend on relationships between industry and individual professionals, mainly in the form of continuing medical education (30 percent), service expenses (24 percent), speaking at events (20 percent), advisory services (15 percent) and consultancy services (6 percent).

[1] For an English version of the legal requirements, see the English document, 'Distribution and Marketing of Drugs: Netherlands', by CMS Derks Star Busmann (2013).
[2] http://www.financielerelatieszorg.nl/geneesmiddelen. Accessed on April 25th, 2016.
[3] http://www.cgr.nl/en-GB/Home. Accessed on April 25th, 2016.
[4] http://www.financielerelatieszorg.nl/cgr-over-welke-financiele-relaties-gaat-het Accessed on April 25th, 2016
[5] http://transparantieregister.nl/en-GB/Over-het-Transparantieregister Accessed on April 25th, 2016

Box 2: Medical and pharmacy education in the Netherlands.

Medical education can be conducted at eight University Medical Centres (UMCs) in the Netherlands: the Erasmus Medical Center (Rotterdam), Amsterdam Medical Centre, VU Medical Centre (Amsterdam), Leiden University Medical Centre, UMC Utrecht, UMC St Radboud Nijmegen, UMC Groningen, and Maastricht UMC+. Every UMC forms a shared administration consisting of at least an academic hospital and a medical faculty of the university affiliated to the UMC. Pharmacy can be conducted at the University of Utrecht and at Groningen University.

Basic medical training, or undergraduate education is comprised of six years of training, divided in a three-year Bachelor's ('preclinical') programme and a three-year Master's ('clinical') programme. Both medical and pharmacy education are organized around a framework/blueprint which defines the national learning outcomes to be attained by all students upon graduation (Blueprint, 'raamwerk'). The learning outcomes are defined in terms of competencies, which is "the ability to adequately perform a professional activity in a specific, authentic context, using an integrated body of knowledge, understanding, skills and professional behaviour" (Laan *et al.,* 2010, p.2). The graduated professional must be capable of combining knowledge, insight, skills and professional behaviour with the competencies: medical expert, communicator, collaborator, organiser, health promotor, academic, and professional. Furthermore, the framework describes a list of issues relating to health and illness.

Box 2: Derived from Blueprint medical education (2009),the blueprint pharmacy education (2016) and Laan, Leunissen and van Herwaarden (2010).

2.2 The pharmaceutical industry in medical education

Multiple studies have analysed medical students' exposure to and attitudes towards pharmaceutical promotion in different countries. These studies were conducted in the US (Goodman, 2007; Sierles *et al.,* 2009; Wilkes and Hoffman, 2001), France (Baron and Bourvon, 2012; Etain, Guittet, Weiss, Gajdos and Katsahian, 2014; Monastruc, Moulis, Gardette, Durrieu and Monastruc, 2013), Germany (Jahnke *et al.,* 2014; Lieb and Koch, 2013), Norway (Lea *et al.,* 2010) and Finland (Vainomäki, Helve and Vourenkoski, 2004). Additionally, Austad, Avorn and Kesselheim (2011) conducted an elaborate international systematic review on undergraduate medical students' exposure to, and attitudes about, the pharmaceutical industry. The current section will be used to describe students' exposure to different pharmaceutical promotion activities during formal education and, consequently, their attitudes towards this exposure. Hereafter, students' attitudes towards education on the topic, as well as actual educational initiatives on promotion will be discussed.

Students' exposure to promotion

A majority of students in all aforementioned studies reported frequent interactions with the pharmaceutical industry and exposure to pharmaceutical promotion activities, especially in relation to small gifts, participating in sponsored education programmes, and contact with pharmaceutical sales representatives (PSRs). Jahnke *et* al. (2014) showed that clinical students in Germany reporting direct contact with PSRs increased from 21 percent in the first year to 77 percent in the final year. Most contacts with PSRs occurred during elective and mandatory clerkships or in the final year (Jahnke *et al.,* 2014). Lieb and Koch (2013) calculated an exposure index, which showed that clinical students had an average of approximately nine contacts with the industry per semester. Lea *et al.* (2010) showed 74 percent of all fifth and sixth year students in Norway had meetings or

conversations with PSRs, with significantly more sixth than fifth year students reporting such exposure. The degree of interaction varied significantly between the Norwegian universities.

Jahnke *et al.* (2014) showed that 70 percent of first year clinical students had accepted gifts from either PSRs or faculty, increasing to 97 percent in the final year. More than half had accepted small gifts one to five times, while 15 percent reported accepting small gifts more than 20 times. Gifts most frequently provided were pens (72 percent), paper pads (52 percent), and free meals (42 percent). The literature review by Austad *et al.* (2011) found that 89–98 percent of clinical students had accepted free lunches or snacks provided by the industry. Furthermore, up to 90 percent of surveyed clinical students received educational materials, such as textbooks or journal reprints, from industry (Austad et al., 2011). Austad *et al.* (2011) observed substantial variability between countries, with students in the US being most exposed.
Interestingly, Austad (2011), Lieb and Koch (2013) and Sierles et al. (2005) found that about two-thirds of medical students had received learning materials (pens and note pads) containing pharmaceutical industry logos from clinical teachers. This deserves attention since faculty members (teaching staff) function as role models for students and should arguably not function as pharmaceutical representatives. Similarly, the Norwegian study explored the role of practicing physicians and showed that 42 percent of students had discussed the pros and cons of gift giving with a doctor at least once, and 10 percent had talked about event sponsorships. More than half of students had a gift passed on to them by a physician, most commonly pens (53 percent), electrocardiogram rulers (30 percent), tourniquets (20 percent), pocket lights, drug pocket guides and reprints (15 percent) (Lea *et al.,* 2011).Although no such studies have been conducted in the Netherlands, the current study suspects a similar situation to other western European countries.

Students' attitudes towards promotion

Overall, attitudes towards interactions with the pharmaceutical industry and promotional activities mostly overlapped between countries, institutions, and students. Most students approved low value items, free meals and gifts with an educational purpose, and considered this normal, appropriate and ethically unobjectionable (Austad *et* al., 2011). Jahnke *et al.* (2014) showed that 92 percent of the German medical students in their clinical years found it appropriate to accept small gifts, and 78 percent had no objection to accept higher value promotional items. Arguments for justification included financial hardship by stating that most others accepted gifts, and that it would not influence their future prescribing behaviour (Austad *et al.,* 2011). Similarly, nearly half of Norwegian students believed accepting gifts was acceptable because of the minimal influence on them, and because of their financial worries (Lea *et al.,* 2011). Although accepting low value items, these students were less accepting towards coverage of travel expenses and social events.

Lea *et al. (*2011) showed that nearly half of clinical students in Norway (47.1 percent, N=777) considered sponsored lectures helpful and informative, although 88 percent did consider the information in these lectures biased (Lea *et al*., 2013). Just over half of these students also found pharmaceutical companies' materials (drug pocket guides, reprints of publications, and glossy brochures) helpful for their studies. Similarly, half of German students reported information from industry sources a useful way of learning about drugs and treatments (Jahnke *et al.,* 2014), and a valuable part of their education (Austad *et al.,* 2011). Almost everybody disagreed with the statement that advantages and disadvantages are presented evenly by the pharmaceutical industry. Similarly, almost all students agreed that promotional gifts are part of a pharmaceutical company's marketing strategy to ingrain its brand in the minds of future doctors (Jahnke *et al.,* 2014).

Changing attitudes over time

A trend was observed in that exposure increased over time and that attitudes changed over time. More students in their clinical years than in their preclinical training considered education from industry sources biased (Jahnke *et al.,* 2014). However, clinical students also more frequently reported that the information was useful to learn about drugs and treatment options (Jahnke *et al.,* 2014). Multiple studies showed that students that were more frequently exposed had more favourable attitudes towards industry (Jahnke *et al.,* 2014; Lea *et al., 2011*; Soyk, Pfefferkorn, McBride and Rieselbach, 2010). Students who encountered PSRs more frequently were found to have more positive perceptions about industry marketing and less likely to perceive marketing as negative (Austad *et al.,* 2011). Additionally, students that were exposed more frequently were more confident in being able to self-regulate interactions with industry representatives (Lea *et al.,* 2011). These same students also more often had the belief that accepting meals from industry was appropriate (Lea *et al.,* 2011). In a US survey, students that were more frequently exposed to pharmaceutical marketing less frequently believed these interactions were inappropriate (Sierles *et al.,* 2005). Also, these students less frequently believed the pharmaceutical industry to be a biased information source and influenced prescribing (Sierles *et al.,* 2005). Furthermore, more frequent interactions with PSRs by students also led to more positive perception of industry marketing. Similarly, another study in the systematic review by Austad (2011) found a significant relationship between the number of gifts received and the belief that PSRs did not influence prescribing (Hodges, 1995).

Uniqueness of self-invulnerability

Although healthcare professionals may aim to exercise restraints on promotion and limit influence, they often do not recognize their own vulnerability to these often subtle promotion techniques (Spurling *et al*., 2010). Many promotional strategies work according to principles of social psychology, through which influence is exerted subconsciously (Damen-Van Beek and van Eijk, 2013; Sah and Fugh-Berman, 2013). Sah and Fugh-Berman (2013) distinguish between six principles of influence that are key to pharmaceutical companies' marketing strategies: reciprocation, commitment, social proof, liking, authority, and scarcity. A systematic review by Austad et al. (2011) showed that almost two-thirds of all undergraduate students reported to be personally immune to bias induced by promotion. Interestingly, those students also reported that fellow students and physicians were influenced by promotion. Jahkens et al. (2014) s showed that 98 percent of respondents agreed that gift-giving by PSRs is part of a marketing strategy. Here, 42 percent of students agreed that accepting promotional gifts influences the prescribing behaviour of doctors in general, while only 14 percent of students believed their own prescribing behaviour would be influenced by the acceptance of promotional gifts. Similarly, the study by Lieb and Koch (2013) showed that 25 percent(N=246/996) of medical students thought gifts were likely to affect their own prescribing behaviour, while 45 percent thought it would affect that of their peers.

2.3 Education on industry interactions

The considerable exposure of medical students, an apparent lack of scepticism towards industry marketing, a potential false optimism in feeling capable in dealing with promotional activities and the uniqueness of self-invulnerability phenomenon indicate that pharmaceutical promotion is highly complex and diverse and should be educated explicitly to all medical and pharmacy students. Physicians, pharmacists and students alike should understand and acknowledge they are, like their colleagues, vulnerable to subconscious influence and bias. However, it seems that students receive little education on pharmaceutical promotion activities and how to deal with it.

Most students reported feeling inadequately educated on how to interact with industry representatives, with studies showing 62–86 percent of medical students request more instruction on the topic (Fein, Vermillion and Uijtdehaag, 2007; Hyman, Hochman, Shaw, Steinman, 2008; Jahnke *et al.,* 2014; Lea *et al.,* 2010; Sierles, Brodkey, Clearly, McCurdy, Mintz *et al.,* 2005; Vuorenski *et al.,* 2008). Three of five Norwegian students felt incompetent in dealing with industry interactions, and nine of 10 students agreed the medical faculty should organize lectures about interaction with the industry (Lea *et al.,* 2013). In the study of Jahnke et al. (2014), most students (90 percent, N=699) stated that pharmaceutical industry influence and dealing with industry influence was never addressed during lectures or courses. Additionally, two-thirds felt inadequately prepared for possible interactions with industry, and 60 percent of students wished the topic would be addressed in education. Similarly, in the survey by Sierles et al. *(*2005), 82.9 percent of 803 students reported inadequate training on interaction with PSRs, and 78 percent required more training about relationships between physicians and pharmaceutical companies. Preclinical students, in particular, expressed the desire to receive more training on industry interactions, although neither preclinical or clinical students commonly expressed feeling confident on the topic (Austad *et al.,* 2011).

2.4 Educational initiatives on pharmaceutical promotion

In 2005, HAI and the WHO conducted a global survey to determine education on pharmaceutical promotion globally (Mintzes, 2005). Although the study does not provide individual country data and is arguably outdated, it does provide insight in the size and scope of educational initiatives on pharmaceutical promotion in Europe and globally.

According to the study, 75 percent of European medical and pharmacy schools indicated to have pharmaceutical promotion as part of the required curriculum, either in undergraduate or graduate (residency) training. However, nearly one-third of medical respondents reported that only one to two hours was spent on pharmaceutical promotion within the required curriculum, largely in the form of lectures. When more time was allocated to the issue, educational techniques other than lectures were used, such as small group discussions/workshops, critical analyses of sample advertisements, responses to case scenarios, or role playing. Also, when more than four hours was spent on promotion, educators were more likely to judge their work as successful. Most frequently cited barriers to success were lack of integration into the curriculum, inadequate time allocation, lack of continuity during clinical training, lack of interest from other university faculty members, students' desire to receive gifts, perceived irrelevance of education about promotion, the financing of study-related activities by the pharmaceutical industry, and students' overconfidence in dealing with the industry (Mintzes, 2005). In particular, those who allocated less than four hours to the topic stated inadequate time allocation as a barrier to success. Pharmaceutical promotion was often only somewhat covered as part of a course, most frequently pharmacology, clinical pharmacology, therapeutics or professional ethics (Mintzes, 2005). Time allocation to promotion differed significantly between pharmacy and medical schools, in which pharmacy schools addressed the issue more elaborately.

Educators primarily aimed to teach students critical appraisal of promotion, increase students' use of independent information sources, and to improve prescribing and dispensing after graduation (Mintzes, 2005). Types of promotion most frequently covered were, in descending order, advertisements, PSRs, sponsored conferences and seminars, promotional research, industry-funded medical or scientific journals, use of 'opinion leaders', gifts, industry-funded research in peer-reviewed journals, use of internet for promotion, free samples, and patient requests for advertised drugs. Considering the limited time allocation in especially medical schools, it is likely that not all types of promotion were covered during training. This is problematic because all physicians and pharmacists are exposed to the wide array of pharmaceutical promotion techniques; therefore, they require knowledge and skills to respond appropriately.

3. Theoretical background

Taking into account the available literature on pharmaceutical promotion as detailed in the previous chapter, the current study expects that Dutch medical and pharmacy students are exposed to pharmaceutical promotion and the issue is also only somewhat addressed. Since it is considered desirable that these students are educated about the topic, the present study will use the construct of readiness to change, more specifically, organizational readiness for curriculum change. Hereafter, a theoretical model by Hafferty (1998) will be discussed, describing three types of curricula: the formal, the informal and the hidden curriculum.

3.1 Organizational readiness for curriculum change

Education of health professionals in the 21st century has not always been able to keep up with the broad array of challenges in healthcare and society (Frenk *et al.,* 2010), resulting in outdated, fragmented curricula with a mismatch of competencies to patient and population needs (Bland *et al.,* 2000; Frenk *et al.,* 2010). Medical schools' curricula are changing continuously in response to transformation in healthcare and society (Frenk *et al.,* 2010; Jippes, Driessen, Broers, Majoor, Gijselaers and van der Vleuten,2013), although researchers estimate high failure rates in these curricula changes (Jippes *et al.,* 2013; Weiner, Amick and Lee, 2008). Many factors have been described in the literature that can facilitate or impede change, including leadership, support, time, financial resources, ownership, and communication (Bland *et al.*, 2000; Jippes, 2013; Weiner *et al.,* 2008). Many of these factors are covered in the construct of organizational readiness for change (Bank, Jippes, van Luijk, den Rooyen, Scherpbier and Scheele, 2015; Holt, Helfrich, Hall and Weiner, 2010; Jippes, 2013; Weiner *et al.,* 2008; Weiner, 2009).

Organizational readiness for change can be assessed using a conceptual framework comprised of three broad dimensions (Holt *et al.,* 2010): motivational (or psychological) factors, capability (or structural) factors, and the level of analysis. The authors argue that *"readiness for change is comprised of both motivational and capability factors, reflecting the extent to which the organization and its members are inclined to accept, embrace, and adopt a particular plan to purposefully alter the status quo"* (Holt *et al.,* 2010, p. 50).

Readiness to change has been referred to as a multi-faceted and a multi-level construct (Holt *et al.,* 2010; Weiner, 2009). Multi-faceted describes both motivational and capability factors. Motivational (psychological) factors refer to an organization's and its members' readiness to change and collective attitudes, beliefs and commitment. This implies that members must have a perceived need for change, a belief that the proposed change is suitable in meeting its intended goal, and the intention that the change will be successful. Capability (structural) factors refer to the organizational capabilities and resources. As such, an organization must have the required expertise, resources, opportunity, and the possibility of deploying that capability. Multi-level describes the multiple levels that can facilitate or impede change, such as institutional, departmental, team, and individual level. A comprehensive assessment of organizational readiness for change should therefore entail both motivational and capability factors operating on the individual and the organizational level (Weiner, 2009).

3.2 The formal, informal, and hidden curriculum

Goodman (2007) indicated that, regardless of the explicit curriculum that is provided to students, the implicit curriculum will teach students what is considered acceptable behaviour. Physicians play a major role in establishing contact with the industry and in passing on attitudes to students (Klaus and Lieb, 2010). This also became clear considering the relatively high number of physicians passing on industry-sponsored gifts to students, and the high number of students discussing the pros and cons of pharmaceutical promotion with a physician, with attitudes matching those of the physician (Lieb and Brandtönies, 2010; Wazana, 2000). Hafferty (1998) discussed the fundamental difference between what is taught to students and what they learn. Accordingly, students learn not only by the formal curriculum, but also by an informal curriculum and a hidden curriculum. A great deal of what students learn is not captured in the stated, formally offered curriculum comprised of course syllabi, books, and handouts. Students' attitude and professional behaviour is largely formed by interpersonal interactions and by the structure and culture of the university.

The informal curriculum targets learning at the level of interpersonal interactions among and between faculty and students. This predominantly takes place ad-hoc and outside formal learning environments. Faculty functions as role models for students and students are likely to adopt the attitudes and behaviour of role models. Faculty have been described as potential change agents and change blockers (Fullan, 1993), thus being able to facilitate or impede change. The informal curriculum may therefore affect readiness to change the formal curriculum (e.g., educate students about pharmaceutical promotion).

The hidden curriculum refers to a set of influences that function at the level of organizational structure and culture (Hafferty, 1998). Accordingly, factors that constitute the hidden curriculum include commonly held understandings, customs, rituals, and aspects that are taken for granted in the educational environment. The hidden curriculum can be used to determine what fundamental messages and values are being created and communicated, and also to explore how particular education activities are reinforced or undermined by these areas.

The informal and the hidden curriculum likely affect what students learn about pharmaceutical promotion, as well as affect organizational and faculty readiness to change. However, the effect of interpersonal interactions, and which hidden messages are conveyed to students, is expected to be difficult to determine, as is implied by the word 'hidden' in the name. The focus will therefore be on education about pharmaceutical promotion in the formal curriculum and, if applicable, readiness to change the formal curriculum. The potential role of the hidden and informal curriculum will be kept in mind throughout the study and the discussion section will be used to reflect on how the informal and hidden curriculum affect the formal curriculum and readiness to change the formal curriculum. Valuable information about the informal and the hidden curriculum will be included in an appendix.

4. Building a conceptual framework

Here, the conceptual framework and the connections between the concepts in the model are explained. Also, research questions are derived from the conceptual model.

In the end, it is most important that physicians and pharmacists show professional, ethical and responsible behavior in prescribing and dispensing medications and in dealing with the pharmaceutical industry, in general. The eventual professional behaviour of physicians and pharmacists is largely shaped by students' knowledge and skills, exposure to and attitudes towards pharmaceutical promotion, which has been referred to as the socialization effect of medical schools (Austad *et al.,* 2011). What students learn is comprised by the formal, the informal and the hidden curriculum. The present study will focus on the formal curriculum. Considering the literature, it is expected that pharmaceutical promotion is only somewhat addressed, particularly in medical education. In addition to assessing the formal curriculum, the current study will examine the readiness to change the formal curriculum. This construct is expected to help the researcher in identifying factors that facilitate or impede integration of pharmaceutical promotion in the formal curriculum. Although Hafferty's (1998) informal curriculum and hidden curriculum are portrayed in the conceptual model, these are not under the direct scope of this study.

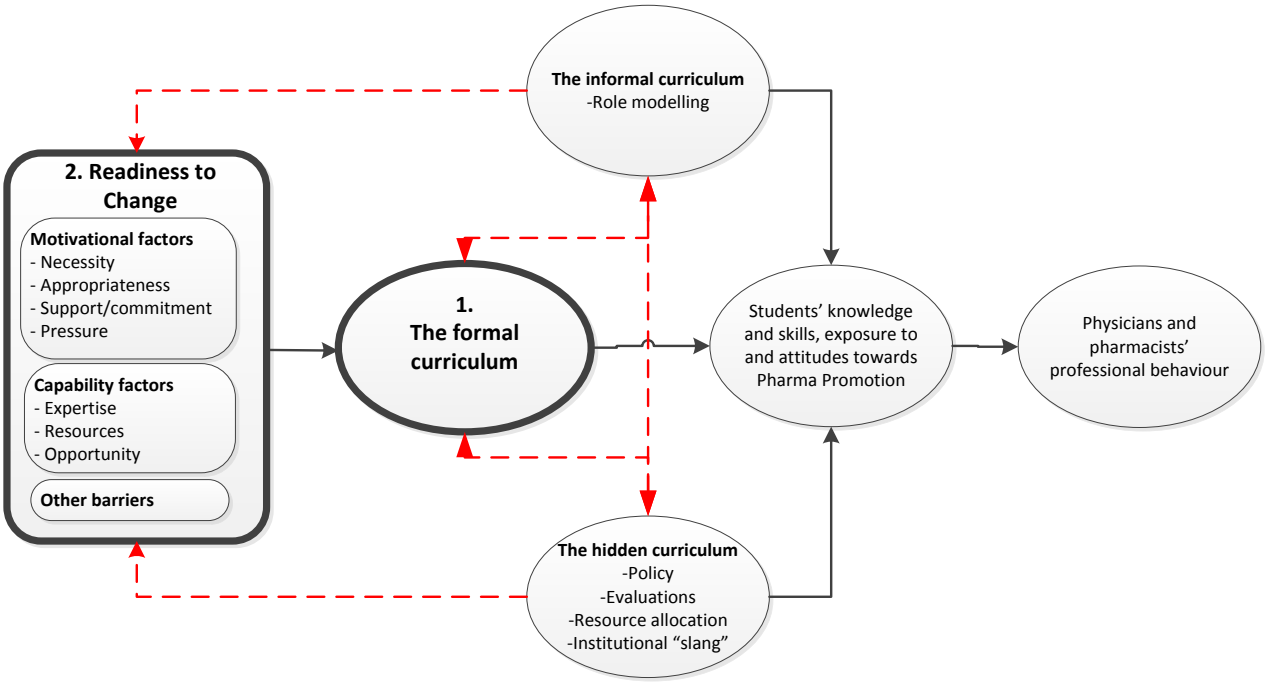

Figure 1: Conceptual model. Note that the focus of the present study is on 1: The formal curriculum and 2: Readiness to address pharmaceutical promotion in the formal curriculum.

4.1 Pharmaceutical promotion and the formal curriculum

The literature review clearly showed that pharmaceutical promotion was, on the whole, not explicitly addressed in the formal medical undergraduate curricula. However, the situation in the Netherlands is not known. The current study will therefore examine educational initiatives that are currently in place in the country to explicitly address pharmaceutical promotion—and which aspects of pharmaceutical promotion they focus on. Types of promotion that may be covered include critical appraisal of advertisements, how to interact with PSRs, sponsored conferences and seminars, promotional research, industry-funded journals, use of opinion leaders, gifts, the use of internet and

free samples. Also, education may address the relationships between physicians/pharmacists and pharmaceutical companies.

In addition to the types of promotion covered, the current study will explore whether this is in the form of lectures or other educational techniques, such as small group discussions, responses to case scenarios, or role playing.

4.2 Readiness to change the formal curriculum

Beyond establishing if pharmaceutical promotion is addressed—and which aspects are being taught—in formal education, this study aims to determine medical and pharmacy schools' readiness to integrate pharmaceutical promotion in the formal curriculum, in case it is not addressed. Here, the aim is to identify factors that facilitate or impede integration of training on pharmaceutical promotion in the curriculum. As elaborated upon in the theoretical background, readiness to change is comprised of two main factors, motivational and capability, which are again subdivided into several sub-factors.

4.2.1 Motivational factors

Motivational factors reflect the attitudes, beliefs and commitment of an organization's members. This implies that members must perceive a necessity to change due to a discrepancy between a desired and a current situation. Furthermore, appropriateness implies that the proposed change (integration in the formal curriculum) is suitable in meeting its intended goal. Also, an organization's members must feel supported in the change and committed to the success of the change. Another factor that may influence members' motivation is a (perceived) pressure, which could be bottom-up from students or faculty, top-down from the dean and other program directors, and external from accreditation committees or the ministry of education/health.

4.1.2 Capability factors

Capability factors refer to the organizational capacity and resources. In this regard, the organization must have the required expertise to be able to address pharmaceutical promotion in the formal curriculum. Furthermore, the organization must have the necessary resources to be able to make the curricular integration a success. Resources may be diverse, including but not limited to, financial resources, staffing, facilities, training, appointments, time allocation, and equipment/materials/tools. On top of expertise and resources, the organization must have the opportunity of deploying that capability (e.g., expertise and resources).

Main research question

What factors facilitate or impede medical and pharmacy schools' integration of an understanding of pharmaceutical promotion in the curricula?

Research questions

1) Which aspects of the effects of pharmaceutical promotion are explicitly or implicitly addressed in the formal medical undergraduate curricula?
2) What factors facilitate or impede medical and pharmacy schools' readiness to address the impact of pharmaceutical promotion in the curricula?
   - 2.1) To what extent do motivational factors facilitate or impede organizational readiness to integrate pharmaceutical promotion in the formal curriculum?
   - 2.2) To what extent do capability factors influence organizational readiness to integrate pharmaceutical promotion in the formal curriculum?
3) Which aspects of the effects of pharmaceutical promotion are explicitly or implicitly addressed in the formal pharmacy undergraduate curricula?

5. Methodology

The current section will be used to introduce and justify the methods of the present study.

5.1 Justification of methods

To answer the research question, a qualitative method was chosen making use of semi-structured interviews. Interviews allow for the exploration of views, experiences, beliefs and motivations of individual participants (Gill, Stewart, Treasure and Chadwick, 2008). Exploring motivations and experiences is particularly relevant for the present study in relation to readiness to change. Additionally, interviews allow for a 'deeper' understanding of social phenomena than quantitative research methods, such as questionnaires (Gill *et al.,* 2008). This more profound understanding is especially important considering that little is known about education on pharmaceutical promotion in medical and pharmacy schools. Furthermore, interviews enable respondents to express their opinions freely without being restricted to a set of answers, as is the case with questionnaires. Semi-structured interviews are chosen because these provide a basis of the topics that must be addressed in all interviews. Additionally, semi-structured interviews are suitable because they allow the researcher to go in-depth on certain topics that appear particularly important to the study (Gray, 2014). Additionally, semi-structured interviews allow for probing to seek for clarification and elaboration of a respondent's answer.

5.2 Ethical testing

Before gathering respondents, ethical testing was conducted at the Netherlands Association for Medical Education (Nederlandse Vereniging voor Medisch Onderwijs, 'NVMO') by the NVMO-Ethical Review Board (NVMO-ERB). This was proposed by the internship hosting company, HAI, to ensure ethical conduct of the research and because international journals for medical education increasingly request a statement by an ethical review board. The NVMO-ERB review procedure has four stages[1]. In the first stage, the NVMO-ERB determined whether they were competent to provide ethical approval, which they were. Thereafter, the second stage determined that ethical issues might be at stake, especially because data still had to be collected. In the third stage, limited review took place, including a review of the informed consent text (Appendix 1) and the research protocol (Appendix 2). After the third stage, the study was granted ethical approval. The ethical review procedure ensured respondents were well informed, anonymity was guaranteed, and helped to improve the invitation letter and research design. This may also have increased the response rate.

5.3 Selection of respondents

Both medical and pharmacy students are subject to pharmaceutical promotion already in education and are exposed to pharmaceutical promotion upon graduation, and both would therefore benefit from education about the issue. Interviews have been conducted with medical and pharmacy school deans, education coordinators, and faculty members from pharmacology and pharmacotherapy. Deans are ultimately responsible for the curricula and are therefore considered an important stakeholder in clarifying the current situation and the readiness for curriculum change. Education coordinators are also considered relevant since they have at least some overview of the curriculum and are directly involved in curriculum development, making them suitable in relation to readiness to change. Faculty members, primarily those in pharmacotherapy, are the ones responsible for the actual pharmacotherapy education, where pharmaceutical promotion is most likely addressed. Additionally, the current study sought to include 'prominent' faculty members, as these have a greater say in the curricula both as change agents or change blockers and as role models/opinion

[1] http://www.geneeskunde-utrecht.nl/nvmoerb/index.php?page=home&lang=en&hash= Obtained on 7/11/2016.

leaders. Additionally, professors in pharmacotherapy are both responsible for the content of the pharmacotherapy curriculum and are role models to students, making them particularly valuable.

Since readiness to change is a multi-level construct, it is considered especially beneficial for the current study to conduct interviews with deans, education coordinators, professors and lecturers. Having respondents from multiple levels is a form of triangulation, allowing for the comparison of findings from different perspectives and thereby increasing the internal validity of the results (Verschuren and Doorewaard, 2010).

5.4 Sampling strategy

The study used strategic sampling rather than random sampling, since the study population was already predetermined. An advantage of strategic sampling is that it increases the external validity of the results (Verschuren and Doorewaard, 2010). Respondents are selected on the basis of their expertise and position in medical and pharmacy education. The primary subjects under study are deans and faculty members from pharmacology/pharmacotherapy. The study aimed to interview either a dean or someone directly involved in curriculum development per university, as well as a faculty member per university involved in pharmacology/pharmacotherapy. The Netherlands has eight medical and two pharmacy faculties. Since the current study aimed to include respondents from all faculties, the study aimed to interview a total of 20 respondents.

The current study took a low response rate into account. A low response rate could be caused by a variety of factors, such as low status of the researcher, full agendas, the upcoming holiday period, unwillingness to participate, and a low priority allocated to the topic. To mitigate the risk of bias due to a low response rate, a low threshold to participate is considered important. Certain efforts were made to increase the response rate, including sending personal emails with an elaborate participant information sheet ('deelnemers informatiebrief') attached to the email (See Appendix 3). Also, interviews were conducted on the respondents' location on their preferred time and date, and the possibility to conduct the interviews via skype (N=1) or telephone (N=3) was offered. In the end, a response rate of around 40 percent was achieved, which made it un necessary to send follow-up emails.

Interview candidates were identified from the respective university websites and HAI's and the researcher's networks. After an interview, respondents were asked to suggest additional candidates that may be relevant to the study. With this snowball sampling technique (Gray, 2014), multiple additional respondents were identified and approached.

Overall, 18 respondents were recruited for the study. Figure 2 shows the respondents and their position in either medical or pharmacy education. Four respondents from pharmacy and 13 respondents from medicine were interviewed, as well as one respondent active in both medicine and pharmacy. Of all respondents, 13 were involved in pharmacology and/or pharmacotherapy education. Seven respondents were involved with educational development. Also, one dean and one vice-dean were interviewed.

R	Primary position	Ancillary position(s)	Involved in
1	Professor clinical pharmacy and pharmacology	Head research pharmacy department	Medicine/pharmacy
2	Head pharmacotherapy section	Internist, clinical pharmacologist	Medicine

3	Head of hospital pharmacy, coordinator medicines education	Professor hospital pharmacy and pharmacotherapy	Medicine
4	Professor pharmacotherapy	Educator of pharmacy staff	Pharmacy
5	Coordinator of medicines education	Professor pharmacology	Medicine
6	Programme director, MSc	Education director	Pharmacy
7	Education director, BSc	Pharmacology teacher	Medicine
8	Professor in training and education	BSc curriculum committee chair exam board	Medicine
9	Vice-dean	Professor	Medicine
10	Professor pharmaceutical patient care	Member of the medicines evaluation board	Pharmacy
11	Dean of faculty		Medicine
12	Ethicist	Public pharmacist	Medicine
13	Pharmacotherapy teacher	Medical business education	Medicine
14	Programme director, BSc	Internist, endocrinologist, professor clinical reasoning	Medicine
15	Professor global health	Consultant, WHO	Medicine
16	Coordinator pharmacology/ pharmacotherapy	Dutch Society of Clinical Pharmacology and Biopharmacy	Medicine
17	Hospital pharmacist	Endowed professor, clinical pharmacy	Medicine
18	Education coordinator	Assistant professor	Pharmacy

Figure 2: Respondents and their position(s) in either medical training or pharmacy training

5.5 Interview design

To ensure consistency and structure between the interviews, an interview guide was developed (see Appendix 4). It was considered important to have a good introduction of the interview in which some background information about the researcher and the purpose of the interview and research was provided. Also, the introduction was used to establish rapport, which is an essential aspect of the interview (DiCocco-Bloom and Crabtree, 2006). It was considered essential that respondents would answer freely and honestly to the questions. To establish rapport, the interviews were conducted in an environment where the respondent felt most safe and comfortable (e.g., on location). Performing the informed consent procedure and providing the opportunity to ask questions were performed prior to the interview as a means to establishing rapport between the respondent and the researcher (DiCocco-Bloom and Crabtree, 2006).

The purpose of the semi-structured interview design was to leave space for the respondent to elaborate on certain topics, while probing others. A set of open-ended questions was carefully prepared that allowed the researcher to obtain data on particular topics without directly mentioning them. The overall design for deans and faculty was the same, although some minor adaptations were

made based on a respondents' function and activities. For example, interviews with deans focused more on an abstract level regarding readiness to change and less on how pharmaceutical promotion was specifically addressed.

Besides the formal curriculum, several questions also addressed the hidden and the informal curriculum. The primary goal was to determine faculty awareness and attitudes towards conflict of interest policies. Policies were assessed because the literature showed this was a tool medical and pharmacy schools have at their disposal to limit influence and shape attitudes. Other aspects of the hidden curriculum and the informal curriculum were also briefly assessed. They are not presented in the results section since they were considered to hinder the flow and structure of the results. However, because valuable information was gathered, the findings have been included in Appendix 6. Additionally, the perceived effect of the hidden curriculum and the informal curriculum on what students learn and on (readiness to change) the formal curriculum is discussed in the discussion section.

5.6 Data analysis

All interviews were recorded and transcribed verbatim making use of *Express Scribe Transcription Software*. Transcribing of the data was performed by the researcher himself in order to become familiar with the data. Interview duration differed between 35 and 65 minutes, and took on average 50 minutes.

Qualitative data analysis is a process through which data is given meaning (Gray, 2014). For the current study, both open and closed coding was applied to the transcripts. In open coding, the researcher identifies concepts inductively, thereby possibly identifying concepts that would otherwise be missed (Gray, 2014). Quotes that appeared particularly useful were highlighted and labelled inductively. These labelled quotes were in turn grouped and divided into sub-concepts. These codes were linked to the core concepts and used to write the results and ultimately, answer the research questions. A coding table was created and has been included in Appendix 5.

Although impossible to fully eliminate the researcher's influence on the result, the current study aimed to do so by checking the transcripts and allocated codes multiple times.
Participant review is a technique for demonstrating validity in interview studies (Gray, 2014). The current study made use of this technique several times. The primary reason was respondents' request to see which parts of the interview would be used in the study before giving consent. Also, respondents could see to it that quotes were not taken out of context and were interpreted correctly.

6. Results

The results section is structured in line with the conceptual model and the research questions. Because large differences were observed between medical and pharmacy training, these are described separately. First, the status of education about pharmaceutical promotion in the medical curriculum is discussed, which funnels into readiness to change the formal medical curriculum. Hereafter, the situation as observed in the pharmacy curriculum is presented. Note that data is gathered from all eight UMCs in the Netherlands, but that in presenting the results, no distinction is made between the different UMCs.

6.1 Pharmaceutical Promotion in the Formal Medical Education

The current section describes different aspects of pharmaceutical promotion that are addressed in the formal curriculum of medical schools, either explicitly about pharmaceutical promotion or implicit aspects (e.g., those aspects that contribute to students' understanding and/or skills to appropriately respond). Generally, respondents from the different medical faculties indicated that promotional activities by the pharmaceutical industry were not covered explicitly in the curriculum or addressed in one or two lectures or work groups. If addressed, it was mostly not structurally embedded in the curriculum. Often, respondents indicated that pharmaceutical promotion is a neglected subject.

"I think pharmaceutical promotion is a neglected subject. I dare to say that students are still highly ignorant towards the pharmaceutical industry and the effect of pharma promotion upon graduation. It is not part of the medical education framework ('het raamplan'), so it does not have to be covered by education." (R3, head of hospital pharmacy, coordinator pharmacotherapy education)

A professor in clinical pharmacy and pharmacology (R1) considered it important for students to be educated about pharmaceutical promotion to ensure physicians are prepared to deal with these forces when they start carrying out their profession. The same respondent indicated that, despite this, students are insufficiently educated about it, as can be derived from the quote:

"*If you ask me whether it is sufficiently embedded in the learning goals of a medical student, then I would say poorly. It is there, but if you really take it serious, and I expect we do, then poorly*." (R1)

A head of a pharmacotherapy section (R2) shared this opinion. Here, the pharmacotherapy section is currently developing a medicines minor, organised around the themes of drug development, registration, clinical practice and education, and society. In the fourth week, which will focus on 'society', the plan is to address several societal stakeholders, including the pharmaceutical industry, and the way it positions its pharmaceuticals. However, the respondent indicates that this is still speculative, with maybe 20–30 percent of students likely to enrol in the minor. Overall, the topic receives little attention and is not addressed structurally or throughout the curriculum. This is well illustrated by the following quote:

"*Very little. I can tell you, that happens maybe in one or two lectures. We have one lecture which addresses manipulation in drug advertising. But training on how to deal with pharmaceutical sales representatives and so forth, to take a critical look and critically handle it, there is very little training on that."* (R2, head pharmacotherapy section)

6.1.1 Best practices

Although the tendency, as described above, was observed at most medical faculties, the current study also aimed to determine which aspects of promotion were covered by education and by means of which educational techniques. Respondents came up with several educational initiatives that explicitly address a certain aspects of pharmaceutical promotion. These 'best practices' are detailed below.

Reading Bad Pharma
One medical faculty addresses the influence of the pharmaceutical industry within the learning track (leerlijn) academic scientific training. Here, first year bachelor students have to read the well-known book *Bad Pharma: How drug companies mislead doctors and harm patients,* by Ben Goldacre. The BSc education director of the respective university (R7) indicated that by doing so, explicit attention is devoted to the power of the pharmaceutical lobbyists. A small group session is also devoted to discussing the book with the students. According to the respondent, the primary goal is to make students aware that they, themselves, are part of the pharma-industrial complex, whether they want to be or not.

Work group: Influencing of prescribing behaviour
At least two medical faculties have established a working group to address the influencing of prescribing behaviour during the Master's phase. At another medical faculty, a lecture is devoted to the influencing of prescribing behaviour. The researcher was invited to attend a 1.5 hour interactive working group at one university, which was during students' primary care (general practitioner) clerkship. In this interactive session, four stakeholders were addressed that influence a physician's prescribing behaviour: public pharmacists, health insurance companies and the government, the pharmaceutical industry, and hospital pharmacists ('ziekenhuisreceptuur'). Students were discussing these stakeholder groups separately and come up with ways in which the stakeholder influenced prescribing behaviour. Regarding the pharmaceutical industry, issues addressed were PSRs, sponsored holidays, sponsorship of seminars/events, free lunches, rising costs of medicines due to marketing, (in)transparency, gifts, glossy folders, seeding trials, the ten-recipes method (i.e., prescribe this medicine 10 times to get a reward), medical opinion leaders, the use of brand over generic names, me-too drugs, gift-giving to the general practice and to physician assistants, and advertising in professional journals. The attendant also stimulated students to discuss the effects of promotion on costs. Note that only one working group was attended by the researcher. Considering the importance of students' own input in this working group, aspects addressed may differ significantly between working groups (R3).

Role play: 'Is a gift ever just a gift'?
Another best practice example, although not structural, is an example of the effect of gift giving. Before a lecture, a professor in clinical epidemiology gives a ballpoint pen to half of the students, while the other half gets nothing. He then gives the lecture as if nothing happened, and after the lecture asks the students to rate the lecture. Interestingly, students that did received a pen are always more positive than those who did not. The respondent states that this conveys a poignant message to students, that receiving something as simple and inexpensive as a pen has such an influence already (R8)

Symposium on promotion
At one university, students can choose four specialisations in the bachelor, one of which is Global Health. Within the global health group, comprising roughly a quarter of all medical students, a global health symposium is organised annually. Here, every three years the topic is pharmaceutical promotion. Since bachelor students from all years take part, all of them will have participated in a symposium about pharmaceutical promotion. However, the respondent does indicate that it is not structural, since it is a separate decision every time which topic is chosen, also depending on students and the dean. The university has just gotten a new dean. (R15)

Reflection on industry-sponsored materials
Another example of explicit education concerning pharmaceutical promotion covers the sponsoring of educational material. Here, an industry firm made several laparoscopic devices available to the UMC for the students' practice. Prior to the training session with the devices, an assignment was created, which asked students what they think of this kind of sponsorship. Students must also think

of a potential pitfall for their future professional practice in engaging with these 'reciprocal services' (R14).

Pharmaceutical sales representatives
At least two UMCs devoted explicit attention to PSRs. At one UMC, a case study was developed, which includes a PSR visit to students. Here, the students must discuss what influencing is at stake (e.g., when being invited to attend a presentation with free dinner afterwards). This will be structurally offered to students in the course 'prelude to professional practice' as part of academic training and professional development. Similarly, another UMC previously provided explicit education about PSRs in students' general practice clerkships. Here, with their consent, several PSRs had been filmed by a (now retired) university professor. This video was played to students to show what happens during these visits. Also, the underlying psychology and mechanisms were discussed afterwards. The respondent (R3) indicated this helped in instilling a critical attitude, but that with the retirement of the professor, the education has also ceased.

6.1.2 Implicit education regarding pharmaceutical promotion

Besides this handful of clear educational initiatives on pharmaceutical promotion, the issue was not explicitly educated to students. However, several educational activities do address the issue implicitly. This includes pharmacotherapy education and evidence based medicine to improve prescribing after graduation, instilling a critical attitude either directly towards the pharmaceutical industry or in general, and devoting attention to doctors' societal responsibility and cost awareness.

Pharmacology/pharmacotherapy education

Pharmacology and pharmacotherapy education is generally organized by the pharmacology department in collaboration with the hospital pharmacy. Several respondents indicated that it is primarily important that students understand the basal pharmacological mechanisms. According to a pharmacology coordinator (R5), students must know how medicines work and what the active site of a certain drug in the body is. When a new substance enters the market, or in cases in which a PSR visits, it is important that a student can determine why this new substance is better or not, and then decide on the added value compared to existing drugs. This pharmacotherapy education is built around the six-step method, which is part of the WHO's *Guide for Good Prescribing*. A pharmacotherapy coordinator (R3) teaches the pharmacotherapy principles to students by means of a decision-tree ('beslisboom'), which includes efficacy, safety and feasibility.

PScribe
Medical and pharmacy schools in the Netherlands use the PScribe programme, which was developed in Groningen. PScribe is a pharmacology/pharmacotherapy e-learning programme that aims to help students learn about medicines and the prescribing of them using the six-step method as a basis. One respondent (R15) indicates that in discussing what reliable information sources are, automatically also the non-reliable information sources are addressed. Both R 15 and 17 indicate that the effects of promotion on rational prescribing can be discussed under PScribe by, for example, a presentation or a video.

Teaching evidence based medicine

Students are also trained in evidence-based medicine during methodology or pharmacotherapy training. Students are trained in critical appraisal of literature and clinical trials. Several respondents indicate that much attention is devoted to reading and interpreting articles and clinical trials, where students learn to look at the underlying evidence and not take something for granted

indiscriminately. Also, attention is given to the sponsoring of an article when assessing the quality, and whether this influences the conclusions. This can be in relation to the industry, but does not have to be. Respondent 14 indicates there are both good and bad articles from the government, the pharmaceutical industry, researchers, and others. Two respondents from different universities gave the example of composing an article with all sorts of advertisements and (false/overly positive) claims by the pharmaceutical industry. In turn, students must take a critical look at these claims and assess the quality of the underlying evidence (R3, R8). In one of these articles, the pharmacotherapy education coordinator constructed an in-silico experiment in which a diversity of statistical arguments was written down as if it were a clinical trial. Students had to examine the paper to determine if it was a trial at all. By doing so, students learn methodological aspects/evidence-based medicine while, at the same time, develop a critical attitude. However, the respondent was somewhat disappointed that, due to time pressure and limited appreciation, there was no longer room/space for the exercise in the curriculum.

Instilling a critical attitude

Multiple respondents said they considered it important that the role of the doctor in society is discussed. The pharmaceutical industry is one stakeholder in society that tries to influence the prescribing behaviour of doctors. On top of the industry, the government also decides whether a drug may or may not be prescribed, and health insurers also influence the prescribing behaviour via their reimbursement policies. A hospital pharmacist (R17) brings about a session in students' first clerkship, in which stakeholders are discussed that influence prescribing behaviour, including the industry. Respondents indicated that students would be warned about pharmaceutical marketing practices from time to time. There was general consensus that it was important to impart a critical attitude to students. Students should be training critically from year one onwards and it is also considered important to maintain students' critical attitudes.

> *"I know it is discussed from time to time, also that students are being warned about industry influence on prescribing. However, we don't discuss the methods used, rather that we point out to students that opinions from industry are per definition shaped by 'stakeholdership', it's always coloured information."* (R16, Coordinator pharmacology/pharmacotherapy)

Several respondents indicated that both instilling this critical attitude and discussing the specific marketing techniques is something that could be improved upon, since it would be useful for students to learn more about this during a lecture. A professor in training and education (R8) states that the pharmaceutical industry is not the only, albeit the most well-known, stakeholder attempting to manipulate or influence the prescribing behaviour of doctors. Therefore, the respondent wants to develop critical students that do not take information for granted and always think about the implications for the patient. Although it is important that students are critical, it is undesired when they are a priori against everything from the industry.

> *"I try to give the attitude to students to look critically at what is offered, not to, up front, dismiss information as coming from a contaminated group they do not want to be involved with. Students need to learn to get the right information from the people on the right level." (R17)*

The bachelor education coordinator (R7) indicated that instilling a critical attitude and thereby addressing susceptibility to being influenced should be part of discourse, just like professional behaviour. The respondent indicates the issue must be a recurring theme, being addressed in more detail before a doctor may prescribe him/herself.

Societal responsibility and cost-awareness

Doctors have an important responsibility to their patients and must therefore act with integrity, also to the pharmaceutical industry. Students must be empowered to make the right choices for their patients, which include a societal responsibility and cost-awareness. One respondent says healthcare, in general, is changing, including the role of doctors in society (R13). This requires additional attention, and doctors and students alike are becoming more aware about this. As the head of a pharmacotherapy department puts it:

> *"Healthcare costs are continuously rising. Due to these rising costs, doctors are forced to think about the financial consequences of their actions, including the prescribing of medications, expensive medications." (R2)*

The professor in training and education indicates that patients are also becoming increasingly cost aware due to the mandatory own-risk (eigen risico) in their health insurance. Here, the respondent explains that this influences patients' behaviour, as prescribed medication is frequently not collected from the pharmacy. Therefore, it becomes continuously more important for doctors to carefully consider what to prescribe and why, and thereby also for the UMC to include this in the curriculum.

6.2 Readiness to change

The current section depicts UMCs' readiness to address pharmaceutical promotion in the curricula. Readiness to change is comprised of motivational and capability factors, both of which are divided into several sub-factors. These are discussed next.

6.2.1 Motivation to integrate pharmaceutical promotion in the formal curriculum

Motivation to change is one of the two main pillars of readiness to change. The current section describes the extent to which motivational factors facilitate or impede medical schools' readiness to address or integrate pharmaceutical promotion in the curriculum.

6.2.1.1 Necessity

Respondents were asked to what extent they considered it necessary to educate medical students about the role of the pharmaceutical industry in society and explicitly about pharmaceutical promotion. This section discusses the perceived necessity to educate undergraduate medical students about the role of the pharmaceutical industry in society and, specifically, about the techniques used in pharmaceutical promotion.

Increasingly discuss the role of doctors in society

Multiple respondents highlight the importance of educating the (changing) role of doctors in society. Both medical and pharmacy students require a thorough understanding of how society and healthcare work, including their role and that of the industry in that system. A UMC dean indicates that students follow academic learning paths in which they learn about the healthcare system, in general, and the stakeholders that are active in the market, including the pharmaceutical industry. The role of the pharmaceutical industry in society and the doctor-industry relationship is discussed here, although perhaps not thoroughly and structurally. The dean does indicate that people are increasingly realizing that students must also be equipped with the necessary knowledge to function in society and understand what is going on 'out there'.

> *"While little by little, we are starting to realize that this IS a real subject. In fact, I am convinced a long time already, that these are important subjects our students must have extensively thought about because soon they have to function in this society where all these things will be coming at them." (UMC Dean)*

Additionally, this tendency can also be observed within the current population of medical students. The dean indicates that students ask for more academic skills, for increasing attention to social medicine and science-and-society studies. Although there will always be people that consider it nonsense, there are also a lot of people that do find it interesting, who want to understand it and realize it is important because they will encounter it in the real world (UMC Dean).

Provide a balanced story

A bachelor programme director (R14) states that attention should be paid to the pharmaceutical industry in medical education, just like there should be attention for other players in the field like insurance companies and the government. Every stakeholder has specific characteristics and certain goals in mind. As such, students should not be warned about the powerful and bad pharmaceutical industry, but their role and functioning in society should be explained and exposed.

> *"That the pharmaceutical industry exerts a certain influence in the form of promotion is the negative side which has to be exposed. However, there must also be attention for innovation from the pharmaceutical industry. I do not believe in the images of the good guy and the bad guy."* (R14)

Similarly, the head of the pharmacotherapy section (R2) indicates that pharmaceutical promotion is a topic that cannot be ignored. Accordingly, it is both important to embrace the pharmaceutical industry and the good things it does, but students must also learn to be critical to their partner, 'with both eyes open'. The pharmaceutical industry has interests that are different than those of a doctor. It is therefore important to not only embrace the pharmaceutical industry as a partner, but also understand the risks involved and be as transparent as possible (R2). A hospital pharmacist (R17) indicates that the role of the industry should be addressed more structurally in the curriculum. Accordingly:

> *"The discussion needs to be held about the place of the pharmaceutical industry in society and healthcare. The industry develops medicines, puts them in the market and needs to make profit on that new drug. However, it is important to keep in mind that it must primarily have added value to the patient."* (R17)

Necessity to educate the techniques used

Besides educating students about their role in society and that of the pharmaceutical industry, some respondents indicate it would also be useful for students to learn specific promotion techniques.

A pharmacotherapy coordinator (R16) indicates it would be useful to discuss the industry marketing techniques with students and show that there is an inherent bias in the way data is presented. The respondent indicates that, currently, little attention is paid to this, which is something that could be discussed in more detail. Similarly, a professor in global health (R15) indicates that promotion is an important subject and that it would be very useful if doctors in training would learn about the techniques used by the industry. Accordingly, the whole spectrum of promotion should be taught, including (ghost) advertisements, seeding trials, disease mongering, the subtle ways in which patients are influenced, as well as grey areas, such as promotion via social media. Although these issues must be raised to students, the respondent thinks that students learn this relatively quickly and would not be time-consuming to address.

> *"You may not even need a lot of time, but it certainly has to be discussed at least once. Most importantly, students' attitude must be changed. You can teach them a few tricks, but it is most important that they are aware that it happens." (R15)*

Similarly, the UMC's vice dean indicates that students should at least be aware that it happens, considering the importance of rational prescribing.

Naivety to vulnerability

Respondents indicated that even though many experienced doctors are also are aware of pharmaceutical promotion, they are still relatively naïve about the size of its effect and think it will not influence them so easily. Similarly, the head of pharmacotherapy (R2) claimed to be surprised about the number of colleagues that believe they are invulnerable to marketing because they are well-educated and intelligent and think they make their own decisions. A professor in training and education (R8) indicates that it is definitely necessary to educate students about their vulnerability to pharmaceutical promotion. Especially earlier in their studies, students are more likely to consider themselves as invulnerable to pharmaceutical promotion.

Prioritization

A frequently mentioned barrier to addressing pharmaceutical promotion is related to prioritization. The head of pharmacotherapy (R2) explains that if you write down all the learning goals on a list, the aspect of pharmaceutical marketing is likely somewhere at the bottom and not prioritized. The respondent would like to see it prioritized higher, but also acknowledges that it only makes up a

small part of pharmacotherapy education. The coordinator of pharmacotherapy education (R3) indicates that it would certainly be useful to educate students explicitly about the techniques because of the subtle nature of pharmaceutical promotion techniques, but that people do not find it sufficiently important to prioritize it.

"You have to create space yourself. The curriculum is packed, so if you want space for something, it is a matter of push and pull and actually it means that something else must give way." (R3)

Efforts have been made to integrate education on pharmaceutical promotion in the curricula, but this is complicated since students have to learn increasingly more in a shorter period has proven a barrier, as becomes clear from the following quote:

"I have suggested to address pharmaceutical promotion in the Master phase, but it is quite simple, the curriculum is packed, so if you come with a suggestion, the question automatically arises, instead of what? And in that discussion, the proposed change did not make it, you probably hear that from others as well." (R3, Coordinator pharmacotherapy)

Increased necessity to educate about pharmaceutical promotion

The head of a pharmacotherapy section (R2) indicates that societal issues, such as pharmaceutical promotion, are becoming increasingly important for a doctor, and that it may even be more important to teach these issues to students than basic pharmacology. Accordingly:

"Maybe a bit provocative, but one can wonder what is most important to know for future doctors. It is quite simple to Google for a beta-blocker, so why devote a lot of attention to that? While this is something that has to do with a different world, and students need to have heard about it before they can really connect to it. It isn't something you can Google, like you can with medicines, and I think it therefore has educational value." (R2)

A teacher in pharmacotherapy (R13) asserts a similar notion. The respondent indicates that what is more important—training people that know where to find something, or train people that really know it—is more important. The respondent indicates that a certain basic, readily available knowledge level is required, but that highly specific knowledge may be becoming less necessary because one can easily search it on the web. Furthermore, the respondent indicates that it is increasingly important to teach the way healthcare is organized, doctors' role in society and cost-awareness.

Decreased necessity to educate about pharmaceutical promotion

Multiple respondents indicated that pharmaceutical promotion has become considerably less problematic than it was 20–25 years ago, when the influence of the pharmaceutical industry on prescribing was much larger. This is, in part, due to societal counterforces ('tegenkrachten'), such as guidelines, monitoring and regulation. Also the drug preference policies of health insurance companies have limited promotional opportunities for the pharmaceutical industry on generic drugs. Another inhibiting factor mentioned by a coordinator of medicines education (R3) is that doctors increasingly work together rather than alone. The coordinator of medicines education thinks the influence of the pharmaceutical industry in the formal undergraduate (BSc and MSc) curricula is small. Accordingly, there is still a lot happening outside the formal curriculum and in specialist training and continuing medical education, but that is more subtle and eludes the respondents' observation. Overall, the notion that pharmaceutical promotion has become less problematic than it used to be may affect the perceived necessity to teach it to students.

6.2.1.2 Appropriateness

It was also considered important to determine the best way to address pharmaceutical promotion in the curriculum, both regarding when/where in the curriculum and by which education type. There was considerable variation in respondents' answers as to when pharmaceutical promotion should be addressed, from already early in medical training, to more towards the end of their studies. The most appropriate moment seemed to be dependent on the specific aspects of promotion to be addressed. For example, issues related to methodology or the imparting of a critical attitude were considered more important to educate early in the Bachelor phase. However, it may be too difficult for Bachelor students to understand the exact ways and extent to which the pharmaceutical industry tries to influence behaviour. Students are increasingly exposed to aspects of pharmaceutical promotion over the course of their studies, and get to understand it increasingly well. When students are explicitly educated about pharmaceutical promotion during their Bachelor's degree, they may still not recognize it when exposed to it in practice. Master students will have spoken to many more people and have encountered certain aspects of promotion, making it easier to understand. Some things come too soon for students, which makes it particularly important to think extensively about the right moment of education (R7).

Just-in-time learning

At one university, first year students read the book *Bad Pharma*. The respective education coordinator (R7) indicates that it would be too soon to educate students about the techniques used in pharmaceutical promotion. Accordingly, this may better be addressed in the master phase or maybe even later in specialist or general practitioner training, when it becomes an important part of their actual functioning (R7). Similarly, a professor in training and education states it would be best to start early in medical training with raising students in a critical manner and confronting them with ways doctors are influenced. However, students should make assignments and discuss more specific issues with each other later in their studies. The respondent points out that it may be especially important for those who are about to conduct research projects to discuss the customs, norms, grey areas and boundaries that may not be crossed. (R8)

Aligned with this is the concept of 'just-in-time' learning, in which the issue should be educated right at the time that students become more exposed to aspects of promotion and become more aware of it. It may be best to address aspects of pharmaceutical promotion along with exposure in a step-wise manner in the form of a 'learning pathway' ('leerlijn'), rather than as a stand-alone course. The head of the pharmacotherapy section (R2) states to start with the basis in which students form a critical attitude about the topic and gradually build on that. A UMC dean thinks pharmaceutical promotion is also suitable for a learning pathway, in which the subject is addressed recurrently through several smaller 'blocks', with increasing complexity.

> *"Something really starts to [come to] life for [a] student when they have experienced it, when they are wondering about what is happening around them. At that moment, it must also come on to the educational agenda, a bit just-in-time learning"* (R9)

As such, a pharmacotherapy teacher (R13) indicates that pharmaceutical promotion should be discussed throughout the different phases of medical training. In the Bachelor, there should be a focus on pharmacology and pharmacotherapy, while only briefly addressing pharmaceutical influence. In the master phase, it would be good to address it in a more practical way, via an assignment or a practical exercise. Additionally, the topic requires some additional attention in specialist training, as well (R13). It may be difficult to address the issue recurrently due to the full curriculum. However, the bachelor's programme director (R14) states that, especially because of

that, it becomes even more important to offer it just-in-time, to ensure the relevance is clear and to be able to go in-depth faster.

A hospital pharmacist (R17) thinks that educating about pharmaceutical promotion can be done in the existing curricula since it does not have to be very time-consuming. A lot can be explained in a one hour lecture already, and it is mentioned sporadically in daily practice. (R17)

Which course or learning pathway

Besides the question of how pharmaceutical promotion may best be addressed, as described above, the current study also aimed to determine where it should be addressed.

Respondent 9 indicates that pharmaceutical promotion is typically a subject that fits well with small-scale education with exercises. Accordingly, issues, such as how to interact with the pharmaceutical industry as a doctor and the dangers and opportunities, would fit well in learning paths, such as academic training, or, associated to this, professional behaviour. Similarly, the Bachelor education director (R7) indicated that this is related to professional behaviour. A professor in global health (R15) indicated that the professional development learning pathway would be a good place to insert it. It is part of rational behaviour in which conflicts of interest must be explicitly discussed, as well as corruption and abuse of entrusted power for personal gain. The medical faculty dean (R11) came up with the learning path science and society, since it is about how the things in science relate to the real world and to the patients. A hospital pharmacist (R17) indicated that attitude-wise, it has to do with professional development, but regarding the place in the curriculum, it most likely falls under pharmacotherapy. The coordinator of pharmacotherapy (R16) also thinks it is essentially an aspect of pharmacotherapy, although not 'pur sang'. What complicates it even more is a tension between modular/block education and learning pathways, as explained by a UMC vice-dean.

"What you see is that the disease-specific professional must collaborate neatly with those from the learning pathway pharmacology to make a perfect fit between modules/courses and the pharmacology pathway ('rode draad'), which is pretty complicated and doesn't always fit." (UMC Vice-dean)

Overall, it becomes clear that pharmaceutical promotion is a bit of a transcending subject, covering aspects related to integrity, ethics, professional behaviour, medical sociology and rational prescribing/pharmacotherapy. A hospital pharmacist (R17) indicates it may not really matter where it is addressed, as long as it is addressed. Important to note here is that from a theoretical perspective, finding the right place likely increase support and thereby also readiness to change, which makes it important to think carefully where to address it.

6.2.2 Capability to integrate pharmaceutical promotion in the formal medical curriculum

The current section will describe the extent to which Dutch UMCs had the capability to change (i.e., to address [and/or integrate] the aspects of pharmaceutical promotion in the formal curriculum. Capability to change, as described in the conceptual framework, is structured around three main concepts: expertise, resources, and the opportunity to deploy the capability. These will be addressed in this section.

6.2.2.1 Expertise to change

Several respondents said they had the expertise to educate students about aspects of pharmaceutical promotion. A professor in clinical pharmacology (R1) indicated that the pharmacotherapy department and likely also the internal medicine department have this expertise. Other reasons mentioned were that there is also a training for pharmacists at the respective university, that pharmacotherapy education is taken seriously, to also have employees with relevant ancillary positions, such as at the Medicines Evaluation Board (MEB, 'CBG') and to conduct research with pharmaceutical companies (R1 and R15). Other reasons were a strong epidemiology department that provides evidence-based medicine training and academic skills training in combination with pharmacotherapy training that is provided by both the hospital pharmacy and a clinical research organization connected to the university (R7).

Another respondent said he had the required expertise, having devoted a lot of attention to the subject in his professional career to be able to recognize potential problems and point these out to others (Head of hospital pharmacy, R3).

However, other respondents were not convinced they had the required expertise to provide education about pharmaceutical promotion. The head of a pharmacotherapy department (R2) indicates it cannot be done from the faculty, and that it would actually be good to have industry representatives (or others) that can openly speak about this. However, it is also difficult finding someone to educate this because the industry is not transparent to the medical world about the amounts of money allocated to marketing, the deployed techniques, and the effects of pharmaceutical promotion.

> *"If you really want to go in-depth on the subject, you can never do that from within the faculty because they just do not have the know-how." (R2)*

A professor in training and education at another medical faculty indicated that it is not structurally addressed. Accordingly, pharmacotherapy education is mainly focused on which medicines to use and modes of action of medicines. The respondent indicates that it is not acknowledged as important, although it may be mentioned because someone finds it personally important to discuss the topic (R8).

Questions own expertise

Some respondents do not really know whether this expertise is available, finding it difficult to oversee whether the expertise is available and questioning whether they have this expertise themselves. Although having personally experienced pharmaceutical promotion, the vice-dean does not know whether the expertise is available. Similarly, the Bachelor programme director and internist at the UMC (R14) indicates that the internists will be able to tell students what they have experienced (R14). However, it may be that certain techniques are so subtle that they are not experienced in the practices and, as such, cannot teach students about those techniques.

Guest speakers

The global health professor indicates that at the triennial symposium on pharmaceutical promotion, some people from the university spoke about it, as well as guest speakers from the pharmaceutical industry and a nongovernmental organization. These guest speakers have the knowledge to explain pharmaceutical promotion to students, and students learn quite a lot in this one day. The respondent explains it is most important that the educators themselves are aware and convinced that this has to be educated to students. Finding the right people to educate it does not have to be a problem. On the contrary, the head of a pharmacotherapy department (R2) indicated it would be useful to have external professionals that could help in designing educational content or in providing guest lectures on the topic, but not to know these people.

A Bachelor programme director (R14) indicates that naming and shaming the pharmaceutical industry is easy, but that it may be especially difficult to find the right person to put down a nuanced viewpoint of the pharmaceutical industry and the way they operate. When inviting someone from a pharmaceutical company, or from NEFARMA (the association for innovative medicines in the Netherlands) doctors may a priori not be willing to listen because they think it is just another lobbyist trying to put down a positive imagine of the industry.

6.2.2.2 Resources to change

Another aspect of capability to change covered whether the resources where available to educate students about pharmaceutical promotion. The most commonly mentioned resources were time and money. To a lesser extent, educational material was also a resource that could facilitate or hamper education on pharmaceutical promotion.

Several respondents indicated that if it was considered necessary to educate about pharmaceutical promotion, the available resources (i.e., time, money) would be available (R3, R8, R14). This is illustrated by the following quote:

> "You must find the right place to fit this in the curriculum. *When we all say that we find it important that students are being educated about it, then money and the necessary resources are available.*"
> (R8, Professor in training and education, member of curriculum committee)

Similarly, the coordinator of pharmacotherapy education (R16) indicated to have a fixed sum of money for education, which is generally enough. The respondent put forward the notion of the full curriculum, stating that devoting attention to pharmaceutical promotion goes at the expense of something else. In regard to study material, the respondent indicates this is something the Dutch Society of Clinical Pharmacology and Biopharmacy (NVKF&B)[2] could do, to include the societal discussion about the role of the pharmaceutical industry in the curriculum, for example via PScribe. However, as was already previously identified, this is complicated since many pharmacologists already have difficult to teach basic pharmacology to students. Furthermore, pharmaceutical promotion is actually broader than pharmacology, so it can be debated whether PScribe is the best place to put it (R16).

Money barrier due to low priority

The professor in global health indicated that the material is available, although it may have to be simplified and made easy to implement for universities. One barrier is that universities must

[2] http://nvkfb.nl/ Retrieved onhttp://www.nvkfb.nl/ 07/11/2016.
The NVKF&B's mission is "to stimulate teaching, research and practice of clinical pharmacology and biopharmacy according to scientific and ethical standards and to promote a good collaboration between those involved in the field." All UMC pharmacology departments are connected to the NVKF&B. Also, NVKF&B is the organization responsible for the PScribe program.

primarily be interested to embed the issue in the curricula. Another barrier is related to money for guest speakers, as there may not be space and budget available in the curriculum. The same notion is put forward by the head of the pharmacotherapy section of another university, indicating that the issue is not currently acknowledged as being important and that everything is organized on a low-budget, making it problematic to pay for guest speakers.

Readily available material

A coordinator of pharmacotherapy education indicates that it is the department's own responsibility to set something like this up. Also, the respondent indicates that they organize pharmacology and pharmacotherapy education around Rang and Dale's *Pharmacology* book. Pharmaceutical promotion is not addressed in Rang and Dale, and the respondent considers it undue to charge students with (the purchasing of) an extra book for a subject like this and, secondly, the respondent doubts whether this is available.

"You see more often that certain subjects are not ready-made (kant & klaar), and this seems typically a subject of which I cannot imagine there are readily made booklets available. Only if there were some concise article available in a quality magazine or ready-made booklets we could use that." (R5, Coordinator of pharmacology/pharmacotherapy)

6.2.2.3 Opportunity to deploy capability

In line with capability to change, the current study also aims to determine whether UMCs have the opportunity to deploy both the expertise and the available resources. It seemed that opportunity was often in line with the perceived necessity, implying that if pharmaceutical promotion was considered necessary to teach by either departments or individual professors, an opportunity would be created. A coordinator in pharmacotherapy (R5) indicates the department safeguards the pharmacology education, and it is their responsibility to embed issues in the curriculum when they collectively consider it necessary. A similar notion is put forward by a professor in clinical pharmacy and pharmacology (R1):

"We develop material ourselves with the aim to use it, so it would be strange not to. You do see that when you for example adopt a new curriculum or when you get a new professor. When something disappears from the curriculum or the new professor is unwilling, this may result in unused resources. But at this moment, we still use what we develop." (R1)

Top-down opportunity

It is also possible that an opportunity arises due to top-down prioritization from government or hospitals' boards of directors. The head of the pharmacotherapy department (R2) gives the example of the HARM-study (Hospital Admissions Related to Medication, 2006), which showed a high number of medication-related hospital admissions and additionally that many of these were preventable. After the study was published, the minster of VWS (Edith Schippers) instructed this had to be improved by hospitals. As a result, the issue becomes prioritized by the hospital's board of directors, resulting in an opportunity to address the issue in the curriculum for the pharmacotherapy department. The same respondent gives another example, currently being in a good position because the director of the educational institute finds pharmacotherapy and pharmacology important. Consequently, the director agrees relatively easily to proposals by the head of pharmacotherapy. The respondent indicates that it is very time and place dependent.

6.2.3 Other barriers affecting readiness to change

In case pharmaceutical promotion was not addressed in the formal curriculum, respondents were asked to come up with barriers for inclusion in the formal curriculum. These have been portrayed here.

Lack of pharmacotherapy

Several respondents indicated that pharmacology gets to little educational space in the curriculum. The head of the pharmacotherapy (R2) section indicates that pharmacotherapy forms a large part of doctors' professional duties and therefore should receive increasing attention in the curriculum. Surprisingly, the coordinator of pharmacotherapy (R3) indicated that the current framework medical education does not have any learning goals in regard to medicines, except that a doctor must be able to compile a treatment plan. The respondent has complained about this at the national visitation committee, since doctors have to deal a lot with medicines and because it is high on the societal and the political agenda, especially regarding medication safety. At the respective university, the envisaged goal is that, upon graduation, a doctor must be able to prescribe medication responsibility.

Due to the limited size of pharmacotherapy education in the curriculum, the pharmacology education coordinator (R16) explains there is a tendency to primary focus on the more practical aspects of good prescribing such as interactions, patient characteristics and possible adverse events, rather than these more transcending issues. The time available will thus be devoted to the more 'hard-core pharmacotherapy', and the more sociological aspects of it is quite easily removed and/or forgotten (R16).

The professor in clinical pharmacy and pharmacology (R1) indicates that curricula are being revised continuously. Because of these curricular changes, the respondent indicates it is a continuous 'battle' to embed the pharmacotherapy programme the way they want it in the new curriculum, which is quite difficult. The respondent indicates that it was well integrated in the previous curriculum (developed in 2000), with lectures, work groups and in the master's also inclusion of the hospital pharmacy. Now, after the recent curriculum revision, the respondent indicates to be trying to get it back in but that it is vulnerable, also because the professor that constituted the programme in the previous curriculum has just become emeritus/retired.

Dependence on individual professors

In some instances, pharmacotherapy departments or individual professors considered it important to educate about promotion, and consequently created space to address the topic. However, when these professors leave the university, the education also evaporates. This personal dependence is another aspect that may be a facilitating or an impeding factor, quite heavily dependent on the context. A complicating factor in medical education is the large group of faculty with few people having oversight on the whole curriculum (R8, professor in training and education). Also, many of these doctors and lecturers have personal fascinations. Regarding pharmaceutical promotion, the respondent indicates it is not structurally offered to students, and in case it is addressed, that is because it is a hobby/fascination of someone. The respondent indicates this is actually a shame.

Forgotten subject

The professor in global health indicates that people may just not think about addressing pharmaceutical promotion. *"It's not that people are against it, rather that they just forget it"*. (R15). Therefore, the respondent indicates that it must be made easy for universities to address this in the curricula. Since the currently available manual (HAI, 2016) may be too extensive, it may be better to make a selection from the available material. The respondent indicates that the manual should be designed so that it can be explained in about a two hour session, with some reading material and a

working group assignment. Thus, the advice is to develop a simple manual which can be easily embedded by universities. (R15)

Difficulty/resistance in addressing transcending subjects

The dean indicates that the medical curriculum is constructed around disciplines such as cardiology, internal medicine, surgery, and also the more fundamental side such as immunology, cell biology, medical physics and so forth. These more technical, medically oriented disciplines demand their part, which makes it difficult to create space in the curriculum to address these general, transcending subjects. Faculty members will say very well, educate about pharmaceutical promotion, but not at the expense of my hours. Furthermore, the dean indicates that, in their opinion, teaching these transcending subjects would go at the expense of 'real education'. However, in the dean's opinion, subjects like (bio)ethics, the philosophy and history of science and stewardship *are* an important discipline on itself. Although the disciplines demand their bit, the dean indicates that a shift can be observed for the past 5-7 years in that more attention is given to these topics. People need to, and are starting to realize that this is a real discipline and that it would help a great deal for their future functioning if students would learn more about this. The dean indicates the discussion ('battle') must be started again for it to enter the curriculum.

6.3 Pharmacist training and pharmaceutical promotion

The current study explored whether medical and pharmacy students receive education on pharmaceutical promotion. Although pharmacists may not prescribe medications themselves, they are the dispensers of medications and are targeted by the pharmaceutical industry's promotion techniques. The current section will firstly elaborate on the training that pharmacy students receive on promotion, explicitly and implicitly. Thereafter, expertise, resources and opportunity are addressed. Note that readiness to change is not addressed, since readiness to change only applies in the case that change is required.

Aspects of pharmaceutical promotion in the formal pharmacy curriculum

In one pharmacist training, a five-week course is dedicated explicitly to medication policy, addressing Evidence Based Medicine (EBM), pharmaco-epidemiology and regulation around pharmaceutical advertising. Evidence based medicine is also a separate course in year two of the bachelor. Among others, students are trained in assessing the quality of scientific articles, including industry-sponsored articles that may be subject to pharmaceutical promotion. According to a professor in pharmaceutical patient care (R4), industry-sponsored articles are not necessarily good or bad, but must always be looked at critically. The respondent gives the example of the industry comparing their medication with a nonsense therapy, using surrogate endpoints or comparing with a high-dosage pharmaceutical and stating that their drug is safer and has less side-effects.

A former industry employee is currently employed at one pharmacy department and provides a lecture to students about the marketing tricks used by pharmaceutical industry. On top of this, a professor on pharmaceutical law provides a lecture about the legal framework surrounding pharmaceutical promotion and advertising. Pricing mechanisms by the pharmaceutical industry are also addressed. Additionally, pharmacotherapy counselling (Farmacotherapeutisch Overleg, FTO) is simulated to give students insight in the way pharmacists and doctors function and complement each other in daily practice. Regulatory affairs are discussed within the EBM course, where groups of students have one week to detail all events around a deliberately chosen medicine and identify pitfalls/tricks somewhere in the drug life cycle. Diverse issues may be at stake here and students are learned to get to the bottom of a problem, which may be related to (lack of) transparency from the industry, off-label prescribing, 'evergreening' strategies by the pharmaceutical industry to extend their patents, disease mongering in which the therapeutic area/range ('indicatiegebied') is widened, issues related to insurance of new medications or in the media, the role of patient support groups and so forth. The respondent indicates to carefully select only those medications that have one or multiple of the aforementioned issues, thereby stimulating students' critical attitude and skills in evidence based medicine (R6, Master's programme director).

Critical attitude

A professor in pharmacotherapy (R4) indicates to be fully against the marketing of medicines by the pharmaceutical industry, since it is just completely unnecessary. Accordingly, all the knowledge about medications is available via objective sources such as the Medicines Evaluation Board and the Dutch website 'het farmacotherapeutisch kompas'. The pharmaceutical industry will always provide biased information and aim to increase the prescription of certain medications. Therefore, the respondent indicates it is in no way necessary that industry representatives inform doctors and pharmacists about their medicine. The professor in pharmacotherapy indicates that a very negative image is created about promotion and marketing, among others by himself. (R4) Accordingly:

> *"Students are also confronted with marketing, and raised to be very critical. Whenever I can I tell them that they shouldn't invite the industry or listen to them because they just don't need them.*

Everything is laid down in objective documents, look in those! The only reason the industry wants to explain something is for their own sake, which isn't even in the best interest of the patient." (R4)

This same notion is also put forward by other respondents, stating that it is particularly important that students are always critical at information sources (R6). The professor in pharmaceutical patient care states that students are encouraged to be critical towards the pharmaceutical industry. Accordingly, students should not blindly believe what is stated or said but look thoroughly at the underlying data. The respondent thinks this critical attitude is not conveyed to students in one specific course, but that this is spread throughout the curriculum (R10).

Expertise

The respondents from the pharmacy educations indicated that the expertise is present to teach the knowledge and skills to appropriately respond to pharmaceutical promotion. Many of the faculty have relevant ancillary positions at for example the Medicines Evaluation Board and the National Healthcare Institute. Also, a former employee of a large pharmaceutical company teaches some promotion techniques to the students. The head of the pharmacy department thinks it would be a valuable addition to have an external organisation with another opinion or perspective, such as IVM or HAI, to give a lecture to students.

"*I think we have the basic expertise and that it is always nice to complement that with people from the outside that are doing this on a professional basis, also to provide insight to students about the daily practice.*" (R6)

In the master phase, pharmacy students participate in a symposium around expensive mediations, such as Pompe's disease and Hepatitis C. Here, guest speakers are invited including representatives from the national healthcare institute (Zorginstituut Nederland) to explain about reimbursements, a representative from the pharmaceutical industry to explain about the development process and why drugs are as expensive, and also scientific researchers to tell about the pharmaceutical product and its therapeutic value. Other guest speakers may also be invited to explain their point of view to students, including from the Dutch Institute for Rational Use of Medicine (IVM), the Medicines Evaluation Board (CBG), or the Dutch Healthcare inspectorate. Also, the professor in pharmaceutical patient care (R10) indicates that pharmaceutical industry representatives may be invited to give a lecture to pharmacy students, in which for example the drug life cycle and drug pricing mechanisms can be discussed.

Resources

Respondents from pharmacy training were asked whether they have the resources to educate students about pharmaceutical promotion. The programme director indicated that it is an integral part of their curriculum, and that therefore the financial resources are available.

Another aspect of pharmacist training is that students have to look up practically all their information themselves. As such little is done with books, but students are enabled to find the right information from objective sites and sources, primarily the primary scientific literature. This stems from the notion that students must also be able to find the right information long after graduation. The university teaches pharmacy students to approach problems correctly, which is their own responsibility. One example here is that pharmacy students are trained to barely use the 'farmacotherapeutich kompas' (which is widely used by medical students), since this is only a summary and not the full information.

7. Discussion

The aim of this study was to provide recommendations to medical and pharmacy schools on areas that require additional attention to minimalize potentially negative effects of pharmaceutical promotion and ensure responsible prescribing practices. This was done by assessing educating about pharmaceutical promotion in medical and pharmacy schools' curricula and determining factors that facilitate or impede medical schools' integration of pharmaceutical promotion the curricula. The findings as presented in the results section are briefly discussed here and compared with the literature. Additionally, the role of the informal and the hidden curriculum on what students learn is discussed, as well as how they influence readiness to change the formal curriculum. Thereafter, the discussion section provides the strengths and limitations of the study, discusses the impact of the study and provides several suggestions for future research.

7.1 Aspects of pharmaceutical promotion in the formal medical education

Here, the goal was to determine which aspects of the effects of pharmaceutical promotion are – explicitly or implicitly – addressed in the formal medical curriculum. Overall, it can be said that only few aspects of pharmaceutical promotion are being addressed in medical education and that these are not structurally offered. As such, pharmaceutical promotion is a neglected subject in undergraduate medical training. Some best practices were observed, although this is only a handful at the different UMCs. The study of Mintzes (2005) showed that European medical schools devoted only limited time to education on pharmaceutical promotion and pointed out lack of integration in the curricula as a frequent barrier. This corresponds with the findings of the present study, with a low priority as an explanatory underlying factor. Furthermore, the primary aims of educating students about pharmaceutical promotion in the study of Mintzes (2005) were to instil a critical attitude, increase students' use of independent information sources and to improve prescribing and dispensing after graduation. It became clear in the present study that Dutch medical schools also teach evidence based medicine and train students to use independent and objective information sources. The high variability between medical schools can at least partly be explained by the presence or absence of individual professors that consider it important and embed it in – mostly pharmacotherapy – training. Despite these good initiatives, the current study argues that pharmaceutical promotion should be more structurally offered at medical schools.

A recent trend was observed in that increasing attention is being devoted to doctors' societal responsibility and cost-awareness. However, a larger emphasis should be put on the transcending subjects such as doctors' role in society and the role of stakeholders in society that try to influence prescribing behaviour.

A large difference was observed between medical and pharmacy schools regarding the education on pharmaceutical promotion, which is in line with the literature which found a significant difference between medical and pharmacy schools regarding the time allocated to promotion (Mintzes, 2005). Since medicines are the core business of pharmacy schools, they devote elaborate attention to the pharmaceutical industry, in general, as well as explicit and implicit education on pharmaceutical promotion.

7.2.1 Motivational factors that affect medical schools' readiness to address promotion

Overall, respondents indicated that medical students require an understanding of their functioning in society in general as well as an understanding of the marketing activities of the pharmaceutical industry. This is especially true because students and practising doctors alike seem to underestimate the effects of pharmaceutical promotion, which is in line with findings from Spurling *et al* (2010), Damen-van Beek and van Eijk (2013) and Sah and Fugh-Berman (2013), among others. Although

acknowledged as important to address, other aspects in medical education and within pharmacology were prioritized over pharmaceutical promotion. A lack of priority is considered an overarching barrier, affecting several other aspects of readiness to change. Nonetheless, it became clear that more attention can and should be devoted to education about pharmaceutical promotion.

There was considerable variance as to where and when pharmaceutical promotion should be addressed, which in part can be explained by the broad array of activities that comprise pharmaceutical promotion. Students must be trained critically throughout undergraduate and graduate training. Specific education on pharmaceutical promotion (techniques) should be addressed just-in-time, when students also become exposed to PP. Exposure to pharmaceutical promotion in Dutch UMCs seems to concur with the literature, showing a gradual increase over the course of medical training (Austad, 2011; Jahnke *et al.*, 2014; Lieb and Koch, 2013; Sierles et al., 2005). Education specific pharmaceutical promotion mechanisms is best suited for the Master's phase, since students will have been exposed by then, increasing the relevance of education.

Choices have to be made on what to include and what not to include in the curricula, since medical students need to learn more and more in a given amount of time. Generally, the broader pharmacotherapy was already considered a neglected subject, although this finding may be prone to a certain selection/respondent bias. Nonetheless, this results in a tendency to primarily focus on safe and effective prescribing, rather than this 'transcending' subject. Furthermore, the low priority likely affects support and commitment, since a low perceived importance of the issue decreases support to integrate the issue in the curricula and negatively affects faculty's commitment to integrating it in the curricula. It seems this has already resulted in educational activities surrounding pharmaceutical promotion being removed from the curricula. A low priority of education on pharmaceutical promotion and the associated lack of support and commitment may be due to several other factors, primarily a lack of awareness about the effects of promotion, the aforementioned naivety or simply 'forgetting' the issue because it is no formal learning outcome. The present study has likely contributed to respondents' awareness, since respondents indicated to 'feel they have homework now' and one UMC has actually integrated education on pharmaceutical promotion in a facultative minor on medicines, instead of using a learning module from a pharmaceutical company. Despite this promising development, the current study stresses that all medical schools should embed education on pharmaceutical promotion more structurally and over the width of the curriculum.

7.2.2 Capability factors that affect medical schools' readiness to address promotion

Generally, expertise was not considered an impeding factor to address pharmaceutical promotion. The pharmacology/pharmacotherapy department and the internal medicine department have the expertise to train students in evidence based medicine and critical appraisal and, depending on the UMC, individual professors are available to teach about pharmaceutical promotion. Although not all Dutch UMCs have the expertise to educate about the subtle promotion techniques, inviting external professionals as guest speakers may be a solution here. Altogether, expertise may be a facilitating factor, but does not have to be an impeding factor. This is especially true because an educational guide is available to help EU Healthcare students and professionals understand and counter the ill effects of pharmaceutical marketing[3]. No upfront expertise is required to understand or educate students by means of such a manual.

Many resources are already available at universities and medical schools, including facilities, staffing and rooms. It seems that whether resources are allocated depends on the perceived importance by faculty members. This works both ways, i.e. if prioritized, the time and money are available; if not

[3] http://haiweb.org/wp-content/uploads/2016/10/Fact-or-Fiction-1.pdf obtained on November 11th, 2016

prioritized, the time and money are not available. Respondents indicated that PP is a topic well suited for small-scale education, which is more resource intensive in regard to time, facilities and staffing. Similarly, inviting guest speakers often costs money, which may or may not be made available. Time may be an impeding factor, but does not have to be since education about pharmaceutical promotion does not have to be time consuming. Learning material is another resource that is actually a facilitating factor, since an educational guide about pharmaceutical promotion for HCPs and students is available. However, not knowing that this material is readily available and free of charge, or considering the available material too extensive may pose additional barriers.

The above corresponds with the sub-concept opportunity, as the opportunity to deploy resources and expertise (i.e. capability) appears to be largely dependent on the perceived necessity. An opportunity to put pharmaceutical promotion on the educational agenda may arise when the issue comes on the societal or political agenda. Also, curriculum revisions and hiring a professor or a professor leaving may provide an opportunity but may also be detrimental to existing education.

Opportunities to deploy capability, as well as the motivation to address pharmaceutical promotion in education, seem to be time and location dependent. The literature already showed a high failure rate of curriculum changes (Jippes *et al.,* 2013; Weiner *et al.*, 2008), and many of the described factors that can facilitate or impede change were also found in the present study. On top of this, the informal and the hidden curriculum were expected to influence the curriculum.

7.3 The influence of the informal and the hidden curriculum

The theoretical background already briefly discussed the role of the informal and the hidden curriculum in what students learn. Additionally, as depicted in the conceptual model, the informal and the hidden curriculum influence the formal curriculum and readiness to change the formal curriculum. Although not under the direct scope of the present study, quite some interesting data on the informal and the hidden curriculum was gathered during the interviews and their potential role is elaborately discussed here.

7.3.1 The hidden curriculum and pharmaceutical promotion

The hidden curriculum is reflected upon since it can be used to determine the 'hidden' messages and values in relation to pharmaceutical promotion that are created and communicated to students. Additionally, the hidden curriculum can be used to explore how education on pharmaceutical promotion is reinforced or undermined by the areas under the hidden curriculum, i.e. policy, inclusion in evaluations and examinations, resource allocation, and institutional 'slang' (Hafferty, 1998).

Conflict of interest policies at Dutch UMCs

The literature shows that policies at UMCs that restrict pharmaceutical industry marketing are an effective means to limit students' exposure to marketing (Austad *et al.,* 2011), with students' self-reported attitudes towards the industry being consistent with the policies of their institutions. Furthermore, students from universities regulating industry involvement were also significantly more sceptical towards industry marketing messages (Sierles *et al*., 2005). It seems there is considerable variability in Dutch UMCs' conflict of interest policies regarding interaction with the pharmaceutical industry and transparency in these relations. Furthermore, multiple respondents were unaware whether the UMC had a policy in regard to COI or indicated it was a personal decision whether they would interact with the industry. As such, policies seem to be largely lacking, including in regard to the disclosure of potential conflict of interests (COI), policies that limit the commercial influence on education, on gift-giving, promotional events and industry sponsored symposia. It seems that

medical students are still exposed to a variety of these industry influences at Dutch medical schools. The limited policy existence and also the limited faculty awareness of policy indicates that no messages and values are created or communicated to students that make them more critical towards industry marketing, at least not by means of policy.

Examinations and evaluations

Besides determining what aspects of PP were educated to students, the study also aimed to determine whether these aspects were included in examinations and/or in evaluations. Since the issue of pharmaceutical promotion is barely or not explicitly educated to medical students, it seems very unlikely that PP is included in examinations and evaluations. Thus, no message of perceived important is communicated to students via this area of the hidden curriculum.

Allocation of resources

Resources have already been addressed in the results section as part of readiness to change. The resources primarily referred to were time and money. A connection was observed between prioritization and resource allocation. If the issue was considered important, resources would be available. However, as of yet, little to no time, money, material, or staffing are allocated to education on pharmaceutical promotion. As such, it seems that no message of perceived important is conveyed to students regarding this area of the hidden curriculum.

Institutional 'slang'

Institutional 'slang' overlaps with the informal curriculum to a certain degree, since both address how pharmaceutical promotion is discussed at the level of interpersonal interactions, largely outside the formal learning environment. There seems to be a mixed feeling about marketing practices of the pharmaceutical industry. Accordingly, it is discussed among faculty members when someone maintains close ties with the industry, especially in the case of 'paid' holidays, when a doctor travels at the expense of the industry. Although attitudes are generally dismissive towards marketing, there is also a certain degree of jealousy here, since these trips are also actually quite nice. Besides discussions about faculty members, it seems that the pharmaceutical sales representatives, the marketing guys, they are being looked down, also because they are no equal partner with no medical background. The pharmaceutical industry is sometimes heavily criticized, especially their decisions that make it apparent their primary interest is profit rather than patients. This includes (bragging about) their extraordinary profit margins and no longer providing certain medicines (e.g., Thyrax) or small spectrum antibiotics. Although the importance of the industry is also widely acknowledged, the 'slang' is often negative, referring to the industry as 'greedy grabbers' (graaiers) and 'a bunch of thieves'. It this seems that the 'slang' does convey a more critical sound to students about pharmaceutical marketing.

The hidden curriculum and readiness to change the formal curriculum

Besides the role of the areas under the hidden curriculum by means of messages and values communicated to medical students, the present study hypothesized that the hidden curriculum may affect readiness to change the formal curriculum. It seems that the areas under the hidden curriculum do not convey the message to students that pharmaceutical promotion is considered important, considering the minor role of policy, the lack of inclusion in examinations and evaluations and the limited resources allocated to education on pharmaceutical promotion. As such, the current study argues that it is unlikely that the hidden curriculum stimulates faculty to address pharmaceutical promotion. Rather, it may be argued that the hidden curriculum undermines education activities on the issue. Policy development and implementation may consequently affect faculty's motivation to address the issue in the formal curriculum. Although the pharmaceutical

marketing side is generally put in a bad light, it is considered unlikely that the somewhat negative 'slang' will reinforce faculty to address the issue in the curriculum.

7.3.2 The informal curriculum and pharmaceutical promotion

Here, the influence of the informal curriculum is discussed since role models, in particular, potentially play an important role in shaping students' attitudes towards the pharmaceutical industry and pharmaceutical promotion.

Overall, respondents indicate that role models are very important in shaping students' attitudes and behaviour in general and specifically towards the pharmaceutical industry. The influence of role models increases over the course of education and may even be more important than what can be achieved in formal education. Role modelling is part of social learning, which is strong in medical training because students want to be part of the doctor's environment and consequently easily take over the norms and standards. This corresponds to the socialization effect of medical schools (Austad *et al.,* 2011). Although perceived as important by respondents, there is considerable variation between UMC faculty, where some faculty is highly critical and also communicate this to students, some doctors still benefit from pharmaceutical promotion (and potentially also communicate this to students), and the majority not benefiting from it but also not taking a stance against promotion. Consequently, the influence of role models on shaping medical students' attitudes towards pharmaceutical promotion is also likely to be ambiguous.

It became clear the norm is shifting and the pharmaceutical industry is increasingly approached critically a priori. Several factors contribute to this shifting norm, including an increased awareness of the effects, an increase in regulation, a certain naming-and-shaming, and the issue receiving media (and to a lesser extent also political) attention. Importantly, faculty members are increasingly taking their responsibility and communicating to students not to engage with the industry. However, it seems there is still quite some space for improvement. There are opinion leaders at every UMC but as of yet, it seems they do not communicate explicitly to staff and students at large not to engage with the industry. Since role models are very important in what can be achieved in formal education, it would be desirable to have a more concerted view towards pharmaceutical promotion and have faculty communicate this to students. Ideally, all faculty would show to be aware of it and convey this message to students. Faculty's views may become more concerted by making stricter rules about interacting with the pharmaceutical industry and correcting people that trespass these rules. If opinion leaders in the hospital would stand-up against pharmaceutical promotion and communicate this explicitly, students will take over this attitude and behaviour. This likely also accounts for faculty members, who will not so easy go against the opinion of a key opinion leader.

Faculty members from pharmacology/pharmacotherapy, as well as education coordinators and deans indicated that education on pharmaceutical promotion has a relatively low priority. These respondents also function as role models – some even as opinion leaders – and the lack of prioritization by these role models likely undermines their efforts to educate students about pharmaceutical promotion.

All respondents from the pharmacist trainings indicated to communicate to students that they in no way have to make us pharmaceutical sales representatives because they always provide coloured information favouring the company they represent. This is expected to contribute to the critical attitude of pharmacy students. Also, pharmacist trainings devote explicit and implicit attention to pharmaceutical promotion, so there likely is a relation between the attitudes of role models towards the issue and the education students receive about the issue. Faculty may function as change agents or change blockers (Fullan, 1993), having the potential to facilitate or impede change. As such,

faculty members at pharmacist training likely reinforce educational activities on pharmaceutical promotion, while this is much less clear at medical training.

7.4 Strengths and limitations

Readiness to change is a multi-level and multi-faceted concept (Weiner, 2009; Holt *et al.,* 2010). The current study took multiple levels into account by conducting interviews with the organizational level of deans and education coordinators, the departmental level, and the individual level. This enabled the researcher to compare answers from different levels within one medical school. This form of 'stakeholder triangulation' allowed for the comparison of results between multiple levels, thereby increasing the internal validity of the results. Additionally, because representatives from all Dutch UMCs were interviewed, a comparison between universities could be made.

Semi-structured interviews allow the in-depth exploration of values, attitudes and beliefs (Gray, 2014), and enabled the researcher to gain a deeper understanding of the perceptions of faculty members regarding pharmaceutical promotion and readiness to change. Additionally, interviews allowed for probing of views, perspectives and opinions of the interviewee, which provided more detailed and 'rich' answers.

Another strength is that both medical and pharmacy training programmes were incorporated in the study design. Large differences were observed between the two training programmes in respect to pharmaceutical promotion. Useful insights were gained from pharmacy training that may be transferred to medical training. This regards both the formal and the informal curriculum.

A limitation is that the current study only looked from the perspective of faculty members and did not take the perspective of students into account. Determining students' exposure to, attitudes towards, and knowledge and skills about pharmaceutical promotion, as well as whether these match those of faculty would be a valuable addition to the present study. This is therefore also an important suggestion for future research.

Another limitation is the relatively low number of participants (N=18). Although the number of respondents was sufficient for this rather exploratory study and data saturation seems to have occurred within pharmacotherapy, a larger number of respondents, particularly deans, would have allowed for more finite conclusions. This is especially true considering that at three universities, only one respondent has been interviewed. This may have led to an underestimation of the education on pharmaceutical promotion. Furthermore, the study may have missed certain educational initiatives, since respondents indicated that probably no one has a complete overview of the full curriculum.

The study may also be prone to bias. In research, bias occurs when "systematic error is introduced into sampling or testing by selecting or encouraging one outcome or answer over others" (Panacci and Wilkins, 2010, p. 2). Selection bias may have occurred due to the strategic sampling of respondents from pharmacotherapy, which may have caused the conclusions to be an overestimation of the actual importance of educating about pharmaceutical promotion.

7.5 Impact of the study

The findings of the study illustrate how medical and pharmacy students in the Netherlands are educated about pharmaceutical promotion, as well as medical schools' readiness to change so that the issue would be integrated. Having insight in the status of education on pharmaceutical promotion and faculties' readiness to change is useful as it can help in providing targeted recommendations to these organizations on how they can improve their training programmes, which can in turn improve rational prescribing and decrease the negative effects associated with pharmaceutical promotion on the societal and the level of the individual patient. It can also be used

to stimulate other medical faculties to reassess their dealings with and education about the pharmaceutical industry, specifically promotion. Beside this economic and societal impact, the present study also contributes to the academic realm. Here, the present study contributes to the largely unexplored field of pharmaceutical promotion, in general, and particularly in relation to medical and pharmacist training. Additionally, the present study demonstrates that medical education is comprised of more than what is formally offered, which can be used by future researchers to guide their research objectives and design. Furthermore, the present study directs future researchers to address the greater issue of pharmaceutical promotion, not only in undergraduate training but also in graduate training, in professional practice and society at large.

7.6 Future research

To complement the current study, future research should focus on medical (and pharmacy) students rather than faculty. This includes determining students' perceptions of the education they receive on pharmaceutical promotion, their knowledge and skills in dealing with the industry, their exposure, and their attitudes towards pharmaceutical promotion. Additionally, future research should focus on establishing the influence of role models in education as perceived by students. This would serve as a form of verification of the results of the present study.

Additionally, it would be desirable to determine the status of (education on) pharmaceutical promotion in other countries in Europe. This includes other high-income countries but also low- and middle-income countries in Europe and globally, where the influence may be even larger.

Future research should focus on institutional policies at medical and pharmacy schools and determine whether improvements can and should be made. The Dutch Federation for University Medical Centres ('NFU') reported to start working on a univocal policy on pharmaceutical involvement in education and industry-physician interactions in reaction to a study by Healthy Scepticism (Kleijer and van Eijk, 2010), but it seems that these policies have not been developed or implemented by Dutch UMCs. The study proposed policy at academic medical centres in line with the PharmFree Scorecard[4] by the American Medical Student Association (AMSA), which details 14 areas for conflict of interest policies and provides the opportunity to letter grade institutional policies and rank academic medical centres accordingly (Kleijer and van Eijk, 2010). Similar to the AMSA PharmFree Scorecard is the conflict of interest policy guide by Community Catalyst[5], which can be used by medical schools and UMCs to adopt and improve policies surrounding conflicts of interest and in interacting with the pharmaceutical and devices industries. Besides the potential effect on students' exposure and attitudes, improved policy regarding the pharmaceutical industry would likely also affect the behaviour of role models under the informal curriculum and readiness to change the formal curriculum.

Another notion is that pharmaceutical promotion these days may be less targeted from the industry directly towards individual practitioners, but that more influence is exerted on guideline development, via (seeding) trials, and/or via social media to patients/patient associations. Although outside the scope of the current study, future research is necessary that exposes pharmaceutical companies' contemporary promotional techniques, thereby enabling policy makers and others to limit the potentially negative side effects.

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[4] http://amsascorecard.org/. Obtained on 26/10/2016.

[5] http://www.communitycatalyst.org/initiatives-and-issues/initiatives/prescription-reform/conflict-of-interest-policy-guide. Obtained on 26/10/2016.

8. Conclusion

Pharmaceutical promotion is largely covered in the curricula of pharmacy schools. The pharmaceutical arena is their core business resulting in many aspects of pharmaceutical promotion being addressed both explicitly and implicitly over the course of pharmacists' training. This includes a key role for faculty who take strong stances against pharmaceutical marketing practices, advising not to engage with pharmaceutical marketing. This contrasts medical schools, with most medical faculties devoting little to no attention to the subject. Several factors were identified that facilitate medical schools' integration of education on pharmaceutical promotion, primarily the recognition of the necessity to address pharmaceutical promotion by respondents from all levels (i.e., deans, education coordinators and both coordinators and professors pharmacology/pharmacotherapy). Also, the basic expertise is present and resources can be available. Despite this, several impeding factors were identified, mainly related to prioritization of the subject in a full curriculum. Choices must be made about what can be taught to students in the limited amount of time available, and pharmaceutical promotion is not considered sufficiently important, which could be explained by a limited knowledge of the severity of the effects caused by pharmaceutical promotion. This also affects the support and commitment to integrate pharmaceutical promotion in the curricula. Although the capability factors—resources and expertise—are generally not considered a barrier, the relatively low prioritization affects the opportunity to deploy these capability factors, particularly time allocation. Nonetheless, teaching pharmaceutical promotion does not have to be time-consuming, since students understand (aspects of) pharmaceutical promotion quite quickly.

No strong messages and values against pharmaceutical promotion are conveyed via the hidden curriculum. Dutch UMCs seem to have limited policy measures that prevent conflicts of interest and respondents were often—potentially because of their absence—not aware of the existence or the content of these policies. Pharmaceutical promotion was not included in evaluations and examinations, what could be derived from the finding that pharmaceutical promotion itself is barely if at all addressed. Also, although resources could be allocated, this was not the case. It was considered important to put down a balanced story about the industry, acknowledging their importance and disapproving pharmaceutical marketing. Industry marketing was generally talked about negatively, but this does not seem sufficient for faculty to address pharmaceutical promotion explicitly. Overall, the hidden curriculum conveys no messages and values to students or faculty that interaction with the pharmaceutical industry is undesirable. It also does not reinforce educational activities on the topic.

The informal curriculum, specifically the role model function, was acknowledged as highly important, especially because of the large role of social learning and the socialization effect of medical schools. However, there was considerable ambiguity as to faculty members their attitudes and the messages and values conveyed to students. The norm is shifting in that students are increasingly being recommended not to engage with the industry, but it takes a while before this has become common good. Medical opinion leaders taking a stance, as well as stricter rules and increased awareness may concert views and the way these are communicated.

9. Recommendations

Structurally embed pharmaceutical promotion in the curricula. Currently, there is large variation between medical schools as to whether and to what extent they teach pharmaceutical promotion. This often seems dependent on initiatives of the pharmacotherapy department or an individual professor, resulting in education that is vulnerable and can be omitted from the curricula easily. The current study recommends medical schools to embed pharmaceutical promotion in the curricula more structurally, so that all students understand and can respond to pharmaceutical promotion. This may be done by integrating the issue in the online learning environment PScribe, which is already used by all universities. Another suitable option would be to implement to-the-point material about pharmaceutical promotion in the formal curriculum of UMCs. One document is considered particularly suitable for this purpose, which is the recently published guide by Health Action International, *Fact or Fiction, What Healthcare Professionals Need to Know About Pharmaceutical Marketing in the European Union*[6]. This guide is available online and free of charge, taking away several barriers to education, such as those related to costs.

Offer pharmaceutical promotion just-in-time. Aspects of pharmaceutical promotion must be taught to students 'just-in-time'. As discussed in the results section, pharmacology and pharmacotherapy principles, as well as instilling a critical attitude, should be taught to students early and onwards. In the clinical (MSc) phase, students become increasingly exposed to aspects of pharmaceutical promotion and should more or less simultaneously receive explicit education about pharmaceutical promotion.

Include pharmaceutical promotion in graduate training and continuing medical education. Medical students are increasingly exposed to pharmaceutical promotion over the course of their studies, and may require additional training on pharmaceutical promotion during residency training. Furthermore, since medical students and practicing physicians alike seem to have a certain naivety towards the effects of pharmaceutical promotion and a lack of knowledge and skills to appropriately respond, the current study proposes that practicing physicians should be offered the opportunity to conduct continuing medical education on the issue. Another option would be to offer this education to faculty by means of a top-down decision. For example, the boards of directors at UMCs may require faculty to conduct training on pharmaceutical promotion. This may also have a positive impact on the role model function of faculty and thereby have a more profound effect on students' attitudes and knowledge than providing stand-alone education.

Extend access to the scientific literature. Pharmacy students are elaborately trained in evidence-based medicine, in which students learn little from textbooks, but learn to find the required information from objective information sources, primarily the scientific literature. A problem that could arise here is that students will no longer have access to these primary information sources upon graduation because their access came from university subscriptions to these databases. Universities may consider extending students' subscriptions to these databases.

[6] http://haiweb.org/wp-content/uploads/2016/10/Fact-or-Fiction-1.pdf. Obtained on 26/10/2016.

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Appendix 1: Informed Consent Form

Studie naar de relatie met, en onderwijs over de farmaceutische industrie in de opleidingen geneeskunde en farmacie in Nederland

Ik, (naam deelnemer) ……. ben bij deze akkoord deelnemer te zijn in dit onderzoeksproject.

- Ik begrijp dat deelname aan dit project geheel vrijwillig is en dat ik mij op elk moment, ongeacht de reden, en zonder nadelige consequenties kan terugtrekken uit dit project.
- Ik begrijp dat alle verkregen informatie zal worden geanonimiseerd en als strikt vertrouwelijk zal worden behandeld.
- Ik begrijp dat de verkregen informatie, inclusief dit formulier, zal worden opgeslagen in een afgesloten kast of op een met paswoord beveiligde computer voor een periode van vijf jaar.
- Ik ga akkoord dat de verzamelde onderzoeksgegevens gepubliceerd mogen worden, onder voorwaarde dat mijn naam of tot mijn persoon te herleiden informatie niet wordt vrijgegeven
- Ik begrijp dat verkregen onderzoeksgegevens gebruikt mogen worden voor toekomstig onderzoek, onder voorwaarde dat mijn naam of tot mijn persoon te herleiden informatie niet wordt vrijgegeven.
- Ik begrijp en ben akkoord dat het interview zal worden opgenomen.

Handtekening:…….…….. Datum:……..

Onderzoeker

- Ik verklaar hierbij dat ik deze proefpersoon voldoende heb geïnformeerd over het genoemde onderzoek.
- Als er tijdens het onderzoek informatie bekend wordt die de toestemming van de proefpersoon zou kunnen beïnvloeden, dan breng ik hem/haar daarvan tijdig op de hoogte.

Naam:…….…… Datum:……..

Handtekening:……

Mochten deelnemers klachten hebben over de manier waarop het onderzoeksproject is uitgevoerd dienen deze te worden gericht aan de directeur van Health Action International, Dr. Tim Reed. Overtoom 60/II, Amsterdam 1054HK, Nederland, +31(0)20 412 4523, +31(0)6 4122 8741 Email: Tim@haiweb.org

Appendix 2: Research protocol

Model Onderzoeksprotocol

NVMO-ERB

Brian Tielrooij. 03-07-2016

1. Introductie en rationale

Medicijnen zijn essentieel in onze samenleving, en de farmaceutische industrie speelt een belangrijke rol in de ontwikkeling van nieuwe medicijnen. Echter, tegelijkertijd heeft de farmaceutische industrie ook belangen die niet overeenkomen met die van de bevolking, zoals de verantwoordelijk naar aandeelhouders om winsten te maximaliseren (Meijerink, van Berck-Woerdman, Bosma *et al.,* 2008; Spurling *et al.,* 2010). De Nederlandse Raad voor de Volkgsgezondheid en Zorg (RVZ) onderstreept het belang van een balans tussen het publiek en het bedrijfsbelang (Meijerink *et al.,* 2008).

Gezien het belang van de industrie om de winsten te maximaliseren, worden er substantiële bedragen uitgegeven aan het promoten van medicijnen (Mintzes, Laing, Reed, 2009; Norris, Herxheimer, Lexchin, Mansfield, 2005; Spurling *et al.,* 2010). Dit wordt 'pharmaceutical promotion' genoemd. Bepaalde negatieve effecten zijn geassocieerd met pharmaceutical promotion, waaronder een lagere kwaliteit van voorschrijven, een hogere voorschrijf frequentie, en hogere kosten (Spurling *et al.,* 2010).

Om mogelijke negatieve effecten van pharmaceutical promotion (PP) te minimaliseren en rationeel voorschrijfgedrag te verzekeren wordt het belangrijk geacht dat gezondheidsprofessionals (HCPs) de gehanteerde marketingstrategieën begrijpen en de kennis en vaardigheden hebben om hier mee om te gaan (Mintzes *et al.,* 2009; Mintzes, 2005; Norris *et al.,* 2005. Echter, uit wetenschappelijke studies is naar voren gekomen dat de vereiste kritische houding en het begrip niet altijd aanwezig zijn, mogelijk resulterende in de bovengenoemde negatieve effecten. Dit komt onder andere naar voren uit het 'uniqueness of self-invulnerability' fenomeen, waarbij artsen en geneeskunde studenten het effect van promotie op hun eigen (voorschrijf)gedrag minimaal achten, terwijl ze aangeven dat het wel een invloed heeft op hun collega's (Jahnke, Kremer, Schmidt, Kochen, Chenot, 2014; Mansfield *et al.,* 2006; Mintzes, 2005; Norris *et al*., 2005; Spurling *et al*., 2010). Daarnaast geloven medische studenten die vaker zijn blootgesteld aan de farmaceutische industrie beter in staat te zijn om hier mee om te gaan, terwijl ze tegelijkertijd een positievere houding hebben jegens de industrie (Jahnke *et al.,* 2014; Lea *et al*, 2010). Deze 'cognitieve bias' geeft aan dat in elk geval een deel van de HCPs en studenten niet de vereiste kennis en vaardigheden hebben.

De huidige studie acht het belangrijk dat zowel medische als farmacie studenten al vroeg in hun opleiding worden onderwezen over pharmaceutical promotion. Onderwijs is het primaire leermoment voor studenten, wat een minimum niveau van kennis, vaardigheden en competenties verzekerd. Daarnaast worden zowel medische als farmacie studenten al vroeg in hun opleiding blootgesteld aan de farmaceutische industrie, en neemt deze blootstelling toe naarmate de opleiding vordert (Lea *et al.,* 2010). Nog een reden om PP te adresseren is dat kennis, waarden, houdingen en normen zich vormen tijdens de opleiding en volharden in het latere professionele leven (Austad *et al.,* 2014; Goodman, 2007).

De huidige studie onderzoekt naast de rol van het formele onderwijs ook de rol van het informe onderwijs. Hafferty (1998) maakt een onderscheid tussen het formele, het informele en het 'verstopte'(e.g. hidden) curriculum. Medische (en farmacie) opleidingen kunnen worden gezien als 'culturele entiteiten' en 'morele gemeenschappen', dicht betrokken bij het bepalen wat wel en wat geen acceptabel gedrag is (Hafferty, 1998). Het informele curriculum biedt de mogelijkheid om de invloed van rolmodellen te bepalen. Het hidden curriculum verwijst naar de invloeden op het niveau van organisatie structuur en cultuur, waaronder de algemeen heersende normen en waarden. Gebieden die worden geadresseerd onder het hidden curriculum zijn beleid, inbegrip in tentamens en evaluaties, en de allocatie van middelen.

Door te kijken naar verschillende curriculum-types verwacht de huidige studie een completer beeld te kunnen geven van PP in het medisch en farmacie onderwijs in Nederland. Het doel van de huidige studie is dan ook het bepalen van blootstelling aan, en onderwijs over pharmaceutical promotion in de bachelor en master geneeskunde en farmacie. Dit is nodig aangezien de rol van de farmaceutische industrie in de verschillende geneeskunde en farmacie opleidingen in Nederland niet bekend is. Daarnaast is het niet bekend of en in welke mate/ welke aspecten worden onderwezen, en dus niet bekend is of studenten voldoende voorbereid de arbeidsmarkt op gaan na het afronden van hun studie.

2. Onderzoeksdoelen

Dit afstudeerproject onderzoekt de rol van de farmaceutische industrie in de Bachelor en Master geneeskunde en farmacie in Nederland. Dit betreft onder andere de omvang en reikwijdte van onderwijs dat studenten ontvangen over de relatie en omgang met de farmaceutische industrie, expliciet dan wel impliciet. Daarnaast wordt de blootstelling van studenten aan de farmaceutische industrie en de invloed van rolmodellen bepaald.

De reden dat dit project wordt ondernomen is dat er relatief weinig bekend is over de mate van betrokkenheid van farmaceutische bedrijven in het Nederlandse geneeskunde en farmacie onderwijs en houdingen ten aanzien van de rol van de farmaceutische industrie. Hiertoe wordt onder andere gekeken naar het beleid van de verschillende opleidingen. Daarnaast is het onbekend of, hoe en welke aspecten van de farmaceutische industrie – in het bijzonder farmaceutische promotie – worden onderwezen aan studenten, en of dit voldoende is. Om dit vast te stellen worden interviews gehouden met (vice)decanen, onderwijskundigen en docenten farmacotherapie, farmacologie en professionele ethiek van de verschillende geneeskunde en farmacie opleidingen in Nederland.

3. Doelgroep

Het onderzoek richt zich op de opleidingen geneeskunde (N=8) en farmacie (N=2). Eerdere studies in het buitenland hebben zich met name gericht op blootstelling en houdingen van studenten, gemeten bij studenten. De huidige studie kijkt vanuit het perspectief van diegenen verantwoordelijk voor het onderwijs (decanen, onderwijskundigen) en onderwijzers in relatie tot pharmaceutical promotion, dus hoogleraren en andere docenten farmacotherapie, (klinische) farmacologie en ethiek. Hierbij wordt als inclusiecriterium gesteld dat de respondent momenteel werkzaam moet zijn in het onderwijs, dus niet met emeritaat mag zijn.

Potentiële respondenten worden primair benaderd via email, daarnaast zal ook telefonisch contact worden gelegd. Gezien de grote van de opleidingen en het hoge aantal werkzame docenten wordt het waarschijnlijk geacht dat de beoogde steekproefgrootte van N=20 behaald kan worden. 20 respondenten is een relatief kleine groep, maar wordt voldoende geacht om voorzichtige uitspraken te kunnen doen over de mate van blootstelling en onderwijzing over farmaceutische promotie. Hoe

de uiteindelijke resultaten worden gepositioneerd is afhankelijk van de representativiteit van de steekproef. Hiermee wordt zowel gedoeld op het verkrijgen van respondenten van de verschillende opleidingen als ook respondenten van de verschillende functiegroepen; beoogd zowel onderwijskundigen en docenten in verschillende relevante beroepsgroepen waaronder ethiek, farmacotherapie en farmacologie.

4. Design en Procedure

De studie bevat geen interventie. Het betreft een kwalitatief onderzoek gebruik makende van semigestructureerde interviews die naar verwachting ongeveer een uur, en niet langer dan een uur, zullen duren.

De duur van de studie is in principe 20 weken, wat in lijn is met de periode van het afstudeeronderzoek. Echter, gezien enige uitloop door persoonlijke omstandigheden en de ethische aanvraag zal langer worden doorgegaan met de studie. Daarnaast zal de studie doorgaan indien niet aan het aantal beoogde respondenten is voldaan, tot uiterlijk november 2016.

Interviews zullen worden gehouden op locatie van de respondent, dit om de response rate te verhogen. Indien geprefereerd door de respondent kan het interview ook telefonisch of via skype worden afgenomen.

5. Methoden

Proefpersonen kunnen zonder gevolgen de studie verlaten op elk gewenst moment om welke reden dan ook. De onderzoeker kan om dringende redenen besluiten een proefpersoon uit de studie te halen. Bij beëindiging van deelname door de deelnemer zelf of door de onderzoeker zullen de verkregen gegevens worden verwijderd.

De opnames van de interviews zullen verbatim getranscribeerd worden gebruik makende van de software van het programma express scribe. Na transcriptie zullen de opnames worden verwijderd. Op de transcripten zal kwalitatieve data-analyse worden toegepast gebruik makende van het software programma MAXQDA. Quotes en antwoorden van de verschillende respondenten op specifieke vragen/concepten zullen worden gegroepeerd op vraag/concept.

Transcripten zullen op een met paswoord beveiligde computer worden bewaard voor een periode van vijf jaar en alleen inzichtelijk zijn voor de onderzoeker en zijn directe begeleiders (Dr. Tim Reed en Dr. Eline Regeer).

Het is momenteel nog niet geheel duidelijk hoe er naar respondenten zal worden verwezen in het verslag, aangezien niet geheel duidelijk is wat mag en wat niet. Ik zou het liefst zowel de functie als de universiteit benoemen, bijv: volgens een hoogleraar farmacologie van de universiteit Utrecht is ……. In het geval dat ik een decaan zou interviewen zou ik er niet bij kunnen zeggen de decaan van de UU zegt dat …., aangezien dit direct te herleiden is tot de persoon. In andere woorden, ik wil zoveel mogelijk informatie geven aan de lezer aangezien ik dit belangrijk acht voor de context, maar vind het lastig te bepalen hoeveel informatie ik mag verschaffen. Kunt u mij adviseren hoe ik er voor kan zorgen dat ik belangrijke contextuele informatie behoud, zonder daarbij respondenten te schaden?

Daarnaast vraag ik mij af of het mogelijk is om aan de respondenten te vragen of ik hen met naam en toenaam mag vermelden in het verslag. Het zou kunnen dan sommige respondenten dat geen probleem vinden. Ik zou dit bijvoorbeeld als volgt kunnen aangeven in het informed consent: Ik geef

wel/geen toestemming om mijn naam en toenaam te gebruiken in het verslag. Graag doorstrepen welke niet van toepassing is.

Graag hoor ik uw mening hier over. Indien dit niet mogelijk is zal ik de informed consent houden zoals deze was. Daarnaast heb ik in de deelnemer informatiebrief aangepast dat ik ook de opnames zal bewaren. Ik bewaar enkel de transcripten.

6. (Statistische) analyses

Analyse van de transcripten gebeurd met behulp van coderingssoftware Atlas.ti.

7. Ethische aspecten

Respondenten en hun contactgegevens zullen worden geïdentificeerd via de websites van de opleidingen. Daarnaast zal gebruikt gemaakt worden van 'snowball-sampling', waarbij respondenten na de interviews zal worden gevraagd of zij nog andere respondenten kunnen aanbevelen.

De onderzoeker zal de respondenten uitnodigen via email en informeren middels een uitnodigingsbrief en een deelnemers informatiebrief. Indien respondenten niet hebben geantwoord zal nog eenmaal een herinneringsmail worden gestuurd.

Respondenten zullen niet worden misleid. Er is geen sprake van ongelijkheid, er zal geen druk worden uitgeoefend om deel te nemen. Er zijn geen risico's geassocieerd met deelname aan het onderzoek.

Er zijn geen directe voordelen verbonden aan deelname aan dit onderzoek. Voor deelname aan dit onderzoek geldt geen financiële vergoeding. U wordt gevraagd een tijdsinvestering te doen van 30 à 60 minuten.

Een onderzoeksrapport zal worden geschreven als afstudeerproject van de onderzoeker, Brian Tielrooij. De verkregen informatie zal indien mogelijk worden gebruikt om aanbevelingen te doen aan de betreffende opleidingen/departementen. Voor de toekomst kan het onderzoek nuttige gegevens opleveren. Indien mogelijk zal worden gepubliceerd in een peer reviewed tijdschrift

Het onderzoek wordt uitgevoerd omdat het belangrijk wordt geacht dat voorschrijvers van geneesmiddelen de kennis en vaardigheden hebben om rationeel medicijnen te kunnen voorschijven. Respondenten zullen worden benaderd om te bepalen of hier (voldoende) aandacht aan wordt besteed.

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Appendix 3: Participant information sheet

Deelnemer informatiebrief

Verkennende studie naar de relatie met en onderwijs over de farmaceutische industrie in de opleidingen geneeskunde en farmacie in Nederland

Onderzoeker**:** Brian Tielrooij

Geachte heer/mevrouw,

Hierbij wil ik u graag uitnodigen om deel te nemen aan het onderzoeksproject zoals hieronder wordt beschreven. De gegevens zullen alleen worden gebruik voor onderzoeksdoeleinden en in geen geval tot u herleidbaar zijn. Uw gegevens zijn verkregen via de website van de universiteit en het netwerk van de onderzoeker. Ik wil u vragen onderstaande punten goed door te lezen en als u er mee akkoord bent het informed consent te dateren en te ondertekenen.

Wat is het doel van het onderzoek?

Dit afstudeerproject onderzoekt de rol van de farmaceutische industrie in de Bachelor en Master geneeskunde en farmacie in Nederland. Dit betreft onder andere de omvang en reikwijdte van onderwijs dat studenten ontvangen over de relatie en omgang met de farmaceutische industrie, expliciet dan wel impliciet. Daarnaast wordt de blootstelling van studenten aan de farmaceutische industrie en de invloed van rolmodellen bepaald.

De reden dat dit project wordt ondernomen is dat er relatief weinig bekend is over de mate van betrokkenheid van farmaceutische bedrijven in het Nederlandse geneeskunde en farmacie onderwijs en houdingen ten aanzien van de rol van de farmaceutische industrie. Daarnaast is het onbekend of, hoe en welke aspecten van de farmaceutische industrie – in het bijzonder farmaceutische promotie – worden onderwezen aan studenten, en of dit voldoende is. Om dit vast te stellen worden interviews gehouden met (vice)decanen, onderwijskundigen en docenten farmacotherapie, farmacologie en professionele ethiek van de verschillende geneeskunde en farmacie opleidingen in Nederland.

Door wie wordt dit project ondernomen?

Dit project wordt ondernomen door Brian Tielrooij als onderdeel van zijn afstudeerproject van de tweejarige master *Management, Policy Analysis and Entrepreneurship in the Health and Life Sciences* (MPA) aan de Vrije Universiteit Amsterdam. De onderzoeker heeft Health Action International (HAI) benaderd voor begeleiding gezien hun kennis en bedrijvigheid op het gebied van farmaceutische promotie. De onderzoeker wordt vanuit HAI begeleid door Dr. Tim Reed (Uitvoerend directeur) en vanuit de VU begeleid door Dr. Eline Regeer (Senior onderzoeker en psychiater, Altrecht).

Wat wordt er van u verwacht?

Ik zou u willen verzoeken deel te nemen aan een interview om uw mening en onderliggende redenen hiervoor te bespreken. Het interview zal semi-gestructureerd zijn en neemt naar verwachting tussen de 30 en 60 minuten van uw tijd in beslag. Bij voorkeur wordt het interview persoonlijk afgenomen, maar het is ook mogelijk dit te doen via Skype of telefonisch. Het interview zal worden opgenomen en getranscribeerd voor analyse.

Welke risico's zijn er mogelijk en wat gebeurd er met uw gegevens?

Er zijn geen risico's geassocieerd met dit onderzoeksproject. Mocht u toch zorgen of vragen hebben wat dit betreft, neem dan alstublieft contact op met de onderzoeker en begeleiders, contactgegevens onderaan deze brief.

De transcripten zullen worden bewaard op met een wachtwoord beveiligde computers voor een periode van vijf jaar, waarna ze permanent zullen worden verwijderd. Alleen de onderzoeker en zijn directe begeleiders als vermeld onderaan deze brief hebben toegang tot de data. Uw gegevens zullen gecodeerd worden opgeslagen en bewaard. Alleen de onderzoekers die onderaan de brief genoemd zijn, hebben toegang tot de sleutel van de codes, en daarmee tot de direct herleidbare gegevens. De transcripten van de interviews zullen worden geanonimiseerd en in geen enkele presentatie, rapport of publicatie tot uw persoon herleidbaar zijn. De opnames worden na transcriptie verwijderd.

In de resultatensectie van het verslag zal wel de functie van respondenten worden genoemd, maar geen referentie naar naam of de betreffende universiteit. Verschillen en overeenkomsten tussen universiteiten zullen worden benoemd, maar zonder referenties naar respondenten of functies.

Wat zijn mogelijke voor- en nadelen van deelname aan dit onderzoek?

Er zijn geen directe voordelen verbonden aan deelname aan dit onderzoek. Voor deelname aan dit onderzoek geldt geen financiële vergoeding. U wordt gevraagd een tijdsinvestering te doen van 30 à 60 minuten.

Een onderzoeksrapport zal worden geschreven als afstudeerproject van de onderzoeker, Brian Tielrooij. De verkregen informatie zal worden gebruikt om aanbevelingen te doen. Voor de toekomst kan het onderzoek nuttige gegevens opleveren.

Wat gebeurt er als u niet wenst deel te nemen aan dit onderzoek?

U bepaalt zelf of u mee doet aan het onderzoek. Deelname is geheel vrijwillig. Als u besluit niet mee te doen, hoeft u verder niets te doen. Als u wel meedoet, kunt u zich altijd bedenken en alsnog stoppen, ook tijdens het onderzoek. In dit geval zullen uw onderzoeksgegevens worden vernietigd en niet worden gebruikt voor het onderzoek.

Is het mogelijk de resultaten van het project te verkrijgen?

Ja. U kunt ervoor kiezen een kopie van de publicatie te ontvangen indien de studie wordt gepubliceerd. Ditzelfde geldt voor een kopie van het onderzoeksrapport. Mocht u dit willen, geeft u dit dan alstublieft aan in het interview.

Heeft de ethische toetsingscommissie van medisch onderwijsonderzoek dit onderzoek goedgekeurd?

Voor dit onderzoek is goedkeuring verkregen van de ethische toetsingscommissie van de NVMO, de Nederlandse Vereniging voor Medisch Onderwijs.

Wat indien u nadere vragen, opmerkingen of een klacht heeft?

Mocht u nog vragen hebben of nadere informatie willen ontvangen, neem dan gerust contact op met de onderzoeker en/of de begeleiders van dit project. Dit geldt ook als u een klacht heeft over de manier waarop het onderzoek wordt uitgevoerd. Klachten zullen vertrouwelijk worden behandelt en volledig worden onderzocht. U zal worden geïnformeerd over de uitkomst.

Ik wil u hartelijk bedanken voor uw tijd en overweging om deel te nemen aan dit onderzoeksproject.

Hoogachtend,

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Appendix 4: Interview guide and questions

Welkom. Allereerst wil ik u graag bedanken voor uw bereidheid om tijd en moeite te steken in mijn onderzoeksproject. Ik stel dit erg op prijs. Introduceren onderzoek en doel. Deelnemer informatiebrief gelezen?

Het interview neemt maximaal één uur in beslag. Heeft u nog vragen aan mij voordat we beginnen?

Mogelijke probes:

- Ik weet niet zeker of ik u goed heb begrepen. Zou u dat kunnen uitleggen?
- Zou u hier een voorbeeld van kunnen geven?
- Denkt u dat er nog zaken onbesproken zijn gebleven wat betreft ….
- Wat denk u daar over?
- Waarom denk u daar zo over?
- U vertelt zojuist dat … Zou u kunnen vertellen hoe dit in relatie staat tot ….?

Interview vragen decanen (en docenten)		
1	Zou u iets over uw huidige functie en bijbehorende activiteiten kunnen vertellen?	Algemeen
1.1	Focus binnen uw werk. Onderwijs, onderzoek, opleiding. Uw ervaring en omgang/relatie met de farmaceutische industrie. Verschil met andere opleidingen?	
Het formele curriculum		
2	Zou u mij kunnen vertellen hoe studenten worden onderwezen over geneesmiddelen in het curriculum? (BSc/MSc, farmacie/geneeskunde)	Current situation
2.1	Wordt er expliciete aandacht besteed aan de (toekomstige) rol van de farmaceutische industrie? Marketing / beïnvloeding? KoL, artsenbezoekers, off-label prescriptions, disease mongering, sponsored content, product info, cadeaus, wetgeving, generiek/merk	Forms of PP
2.2	Wordt dit onderwezen als (onderdeel van een) (keuze)vak? In welke vorm wordt dit onderwezen? (HC/WG/discussie/kritisch lezen) Hoeveel uur wordt er volgens u in totaal besteed aan dit onderwerp? Welke aspecten worden behandeld?	Current situation
2.3	Wordt de rol van de farmaceutische industrie behandelt in de leerstof, in tentamens, en/of in evaluaties? Wat is uw mening hierover?	*Evaluations, examinations*
3	In hoeverre is het volgens u nodig om specifiek te onderwijzen over de rol van de farmaceutische industrie? Grondslagen van de ethiek	Necessity
3.1	Wat zou uw inziens de juiste manier zijn om studenten te onderwijzen wat betreft farmaceutische beïnvloeding? Is het passend om dit expliciet te adresseren?	Appropriateness
3.2	Hoe denkt u dat decanen, docenten en artsen binnen het UMC aankijken tegen de industrie en het inbedden van drug promotion in de curricula?	Support/ commitment
3.3	Zijn er bepaalde 'pressure groups' die graag zouden zien dat de relatie met de farmaceutische industrie zou veranderen? / in toenemende mate behandeld zou worden? (studenten/ministers/NGOs/media)	Pressure
4	Wat zijn uw inziens redenen (barrières) om de rol van de farmaceutische industrie wel of niet te adresseren binnen de opleiding?	Barriers

5	Is er binnen de faculteit de vereiste expertise aanwezig om de marketing van de farmaceutische industrie en hoe hiermee om te gaan effectief te kunnen onderwijzen aan studenten?	Expertise
5.1	In hoeverre zijn de (hulp)middelen, de 'resources', aanwezig om studenten te kunnen onderwijzen over omgang met de farmaceutische industrie/marketing? (Is er tijd voor? Is er geld voor? Is materiaal aanwezig? Studieboeken/faciliteiten, training)	Resources
5.3	In hoeverre wordt de aanwezige expertise en middelen ingezet om studenten te onderwijzen over farmaceutische marketing?	Opportunity/ resource allocation
Beleid		
6	Zou u mij kunnen vertellen over het bestaan van beleid dat de universiteit heeft ten aanzien van de farmaceutische industrie? (Is er beleid? is dit bindend of raadgevend? Medewerkers pagina, transparantie)	Policy
6.1	Is een dergelijk beleid in uw optiek nodig of passend binnen de opleiding geneeskunde? Waarom wel/niet?	Necessary/ appropriate
6.2	Wat denkt u dat de houding van docenten en andere medewerkers zou zijn tegenover een dergelijk beleid? (Weerstand?)	Commitment/ support
6.3	Het komt voor dat medewerkers naast hun positie als docent of arts ook een bepaalde functie hebben binnen de farmaceutische industrie, bijvoorbeeld als adviseur/consultant/stuurgroep. Wat is uw mening hierover? Denkt u dat hiermee een bepaalde boodschap naar studenten kan worden gecommuniceerd?	
6.4	Wordt er naar uw idee belang gehecht (druk uitgeoefend) van externe partijen wat betreft het institutionaliseren van een dergelijk beleid?	Pressure
Het informele curriculum		
7	In hoeverre denkt u dat artsen en docenten in de opleiding tot basisarts de houding van studenten ten opzichte van de farmaceutische industrie bepalen? (college, co-schappen)	Role models
7.1	Denkt u dat de houdingen en gedragingen van studenten tav de industrie zal veranderen als gevolg van het onderwijzen over farmaceutische beïnvloeding? En wat betreft het institutionaliseren van beleid?	Role models
8	Wordt er in uw optiek op een bepaalde manier gesproken over de (rol/invloed van de) farmaceutische industrie? (positief of negatief)	Institutional 'slang'
XX	Heeft u het gevoel dat ik nog iets over het hoofd heb gezien? Is er nog iets anders wat u zou willen meegeven? Zou ik u eventueel later nog kunnen benaderen voor vragen of opmerkingen?	Closing

Bedankt voor uw deelname. Ik geloof dat alle onderwerpen die ik wilde behandelen aan bod zijn gekomen. Mocht u dit willen kan ik in een later stadium de informatie die ik in mijn rapport wil gebruiken naar u opsturen ter controle. Wilt u een kopie ontvangen van het uiteindelijke onderzoeksrapport? Nogmaals bedankt.

Appendix 5: Coding sheet

PI = Pharmaceutical Industry
PP = Pharmaceutical Promotion (in education)
BG = Background Information
Note = Relevant, outside direct scope

Exp = Explicit (in direct relation to PI)
Imp = Implicit (Not “)
FF = Facilitating Factor
IF = Impeding Factor

FC = Formal Curriculum
FMC = Formal Medical Curriculum
FPC = Formal Pharmacy Curriculum
ME = Medicines Education / PT
BP = Best Practice

IC = Informal Curriculum (= Role models)
IMC = Informal Medical Curriculum
IPC = Informal Pharmacy Curriculum

HC = Hidden Curriculum
HC1 = Institutional policy
HC1.1 = Disclosure of COI/publicizing ancillary positions
HC1.2 = Disclosure of COI to students
HC2 = Evaluations/examinations
HC3 = Resource allocation (Under Capability 2 & 3)
HC4 = Institutional “slang”

RtC = Readiness to Change
FC.RtC = Formal Curriculum, Readiness to Change
FC.MtC = Formal Curriculum, Motivation to Change
FC.CtC = Formal Curriculum, Capability to Change
HC.RtC = Hidden Curriculum, Readiness to
HC.MtC= Hidden Curriculum, Motivation to Change
HC.CtC = Hidden Curriculum, Capability to Change

MtC = Motivation to Change
(FC/HC).MtC1 = Necessity
(FC/HC).MtC2 = Appropriateness
(FC/HC).MtC3 = Support/commitment
(FC/HC).MtC4 = Pressure
(FC/HC).MtC5 = Resistance
(FC/~~HC~~).MtC6 = Hobby/devotion of individual professor
(FC/HC).MtC7 = Barriers to education

CtC = Capability to Change
(FC/HC).CtC1 = Expertise
(FC/HC).CtC2 = Resources
(FC/HC).CtC3 = Opportunity

IFC = Implicit in Formal Curriculum
IFC1 = Critical attitude in general
IFC2 = Ethics / ethical grounding
IFC3 = Methodology
IFC4 = Critical appraisal of literature
IFC5 = Societal responsibility
IFC6 = Costs, reimbursement

EFC = Explicit education, Formal Curriculum
EFC1 = Critical attitude towards PI marketing
EFC2 = Psychological mechanisms
EFC3 = PSRs / artsenbezoekers
EFC4 = Disease mongering / off-label
EFC5 = Regulation / legislation
EFC6 = Generic substitution
EFC7 = Gift-giving
EFC8 = Sponsored content
EFC9 = Misinformation / ghostwriting etc.
EFC10 = CME / Bij- en nascholing

Appendix 6: The hidden curriculum and the informal curriculum

The role of the hidden curriculum and the informal curriculum were assessed for the current study, since they influence what students learn in education and because they were expected to influence educational activities in the formal curriculum and associated readiness to change the formal curriculum. The hidden and the informal have been placed in an appendix, which is considered to improve the flow and structure of the study, and because these aspects have been assessed less elaborately.

The hidden curriculum

The hidden curriculum was considered important to assess since it can be used to determine the 'hidden' messages and values in relation to pharmaceutical promotion that are created and communicated to students. Additionally, the hidden curriculum can be used to explore how education on pharmaceutical promotion is reinforced or undermined by the areas under the hidden curriculum, i.e. policy, inclusion in evaluations and examinations, resource allocation, and institutional 'slang'.

Policy

The current study aimed to determine whether policies were in place that limited contact with the pharmaceutical industry or eliminated all contact. Additionally, the existence of conflict of interest policies as well as respondents awareness of these policies was explored.

Conflict of interest policies at Dutch UMCs

At several UMCs policies were in place that required faculty to publicize relations with the pharmaceutical industry. A UMC's dean (R11) indicates that these policy aspects are highly important, both in relation to conflict of interest and in relation to research-related activities. The respondent indicates it is very important to avoid conflict of interest, or even to avoid that it seems that there is potential conflict of interest.

"*Because you absolutely want to avoid that it appears that our researchers are being paid by the industry and thus that their statements are not based on their independent scientific opinion, but that they are actually paid and influenced by the industry. We do absolutely want to avoid this and we have to work hard to ensure this does not happen*". (R11)

In order to avoid potential conflict of interest, several universities have policy in place that require faculty to disclose ancillary positions on the staff page on the university website. According to the professor in pharmacy and pharmacology (R1), the university requires faculty to update this regularly and looks at it that this is being done. This disclosure is not only in relation to the pharmaceutical industry but regards all ancillary positions that potentially cause conflict of interest. Several respondents considered it important that faculty is transparent about their potential conflict of interest. An internist and bachelor education coordinator (R14) indicated that it is a personal decision whether to collaborate with the industry or to see pharmaceutical sales representatives. Department may make arrangements about it, but it is not publicized on the university website.

'What I do with the industry is up to me personally. It is registered at the transparency register (transparantieregister zorg). But it differs per department. In my department we have agreed not to do it, although there is one person that does find it useful and does see PSRs. That's a personal consideration for everyone to make, not one that is embedded in policy"(R14)

Several other respondents were unaware of policy existence. A bachelor education coordinator (R7) indicates to assume everybody complies with standards of decency, and does not believe there are

any structural or even incidental shortcomings. The respondent is not against publicizing these ancillary positions on the university's website, but this is not required by the university.

The head of a pharmacotherapy section (R2) indicates not to be aware of policy in relation to the pharmaceutical industry. The respondent mentions there is a code of conduct ('gedragscode'), but has not read the code and does not know what is in it. The respondent does indicate that it is not required by the university to disclose ancillary positions. The respondent does refer to the Code of Conduct for Pharmaceutical Advertising (de CGR), by the Dutch Foundation for the Code for Pharmaceutical Advertising and the rules that have been stipulated in this code, which includes reporting in the transparency register.

The professor in training and education states that it is required to submit ancillary positions to the university, but that this is not open to the public. The respondent explains this does not have to do with unwillingness or keeping secrecy, but rather with clumsiness of the ICT department. Accordingly, faculty is not allowed to adjust anything on the intranet page, since everything is done by a central ICT apartment.

Policy on commercial influence on education

Besides the COI/transparency policy, the current study also aimed to determine whether there was policy that limited or eliminated (commercial) influence on education. It seems that this policy is absent at most universities. The head of hospital pharmacy and coordinator of pharmacotherapy (R3) states that, besides the COI policy, education itself must be free from commercial influence. One way this is given shape is to use generic names over branded medicines. Besides the COI policy and the policy on commercial influence, the respondent is not aware of any other policy measures regarding education.

A bachelor programme director (R14) indicates that, strangely, there is no policy at the respective university surrounding commercial influence on education. The respondent gives the example of letting a diabetes specialist give a lecture about insulin to students, without the specialist having to show a disclaimer. The pharmacotherapy department has agreed to only use generic names in education, the respondent indicates not to see to it whether faculty or guest-speakers prefer to discuss a specific medicine. However, when asked whether this would be appropriate, the respondent thinks that it may actually be overregulation. Accordingly, the respondent thinks that– although possibly personally naive – medical students are not being influenced in undergraduate education. The head of the pharmacotherapy department (R2) indicates it is very unusual that pharma plays a role in education. In case a pharmaceutical representative is invited for a lecture or if pharma-sponsored literature is used, this is indicated and/or discussed with students. However, no policy has been formulated in this regard.

Multiple respondents bring about the congresses and symposia organized by the pharmaceutical industry at the UMCs, which are free to attend for students. This includes congresses with unrestricted grants where pharma provides a sum of money to organise a symposium. Although the respondent indicates that advertising for these symposia and gift-giving are strictly regulated, the industry is allowed to pay for the symposium and often also gives a presentation, which also already is a form promotion. Another respondent states not to believe in 'unrestricted' grants (R16).

> *"I think that you are by definition influenced if you do something with the industry, although many doctors think that is not the case. Say that you talk on an industry-organized congress where you have the freedom to speak freely. In case you are very critical you will never be invited anymore, so generally these presentations will be biased"* (R14, BSc programme director).

A bachelor education director (R7) speaks of the disclosure slides at congresses, and indicates it sometimes seems like a matter of prestige, 'how big is yours'. Although the respondent considers the disclosure important, it is not sufficient. Nonetheless, a professor in clinical pharmacy does indicate disclosure is a powerful tool, since it safeguards ethical behaviour. Accordingly, people have become increasingly careful in their activities, in part because of the required disclosure.

Disclosure of COI to students

Because students must be enabled to form their own informed judgment, the current study examined respondents' attitudes towards disclosure of COI to students. A hospital pharmacists states that, besides university policy on publicizing external activities to the board of directors and the university website, it would be good if teaching staff would be transparent about their potential COI to students. This currently is not required in regular education, but would be a useful part of the role model function faculty has and to convey the message to students about their role in society. The pharmacology coordinator (R16) adds to this that it may be useful to familiarize students with potential COI and create awareness. Although the respondent intuitively does not feel that there is COI that influences the quality of education, it may be useful from a role model perspective. Similarly, the professor in training and education considers it an interesting suggestion, especially to enable students to place the lecture in perspective. A pharmacology professor (R5) considers it an interesting suggestion, but indicates it may be one bridge too far to give disclosure before every lecture. The bachelor education director (R7) thinks that students are not at all interested in the companies their professor engages with. Accordingly, the information will go in the one ear and out the other, especially with bachelor students

Peripheral hospitals and relations with industry

One respondent indicates that although the UMC has policy rules that eliminates pharmaceutical influence on education and students' exposure, peripheral hospitals sometimes do not have these policies. Many of the UMC's students conduct their clerkships in these peripheral clinics and thereby are exposed to pharmaceutical promotion. The respondent indicates that they actually should not accept this and that policy measures should be developed that prohibit this.

Disclosure / policy in pharmacy training

For both pharmacy faculties, ancillary positions have to be reported and are made public on the university's webpage. The master programme director (R6) indicates this is because integrity is such a big issue at the moment, everybody has to update their positions and also have these approved. In case a faculty member has no ancillary positions, the employee must also report this. This ensures that if an ancillary position is not made public, this has been done on purpose. The professor in pharmacy indicates to consider transparency very important, to be able to look up if someone has potential conflict of interest. One area that could be improved upon is a policy that requires faculty to report their interactions with PSRs and such. This is not required but the Master's programme director indicates that there is an increasing number of pharmacists that give education besides their professional practice, and may interact with the industry outside of education.

The respondent does indicate that these ancillary positions likely apply more to doctors than to pharmacists, since pharmacists are not approached by the industry to work on a trial. A contradiction can be observed here, since not all UMCs have policies that require full disclosure while it is particularly important to them.

Examinations and evaluations

Inclusion of pharmaceutical promotion in examinations and evaluations was considered important because this also conveys a message of perceived importance to students, and also because this stimulates knowledge retention. However, the concept does not apply to medical schools, since pharmaceutical promotion at large is barely, if at all addressed. The current study cannot provide a finite answer that it is not at all included in examinations and evaluations, but this seems to be the case.

National pharmacotherapy test

However, from this year onwards, a national pharmacotherapy test will be introduced that is mandatory for all medical students in their masters. The test has been introduced because the national visitation committee had determined that students graduate with a lack of knowledge about pharmacotherapy, while prescribing safe and effective medications is an important aspect of being a doctor. A pharmacotherapy coordinator (R5) indicates it may also be an idea to include some questions about pharmaceutical promotion in the test.

Institutional 'slang'

Institutional 'slang' overlaps with the informal curriculum to a certain degree, since both address how pharmaceutical promotion is discussed at the level of interpersonal interactions. The vice-dean indicates there is a mixed feeling about pharmaceutical promotion. Accordingly, it is discussed among faculty members when someone maintains close ties with the industry, especially in the case of 'paid' holidays, when a doctor travels at the expense of the industry. Although a generally dismissive attitude can be observed, there is also a certain degree of jealousy. Increased transparency has led to increased caution since nobody wants to be on those lists because of the blaming and shaming

Another respondent (R8) indicates that especially the marketing guys, the salesman, that they are being looked down on, a bit considered as losers. The respondent indicates that the overall picture of the pharmaceutical industry is more nuanced, with some exceptions, for example when they no longer provide a certain medicine (e.g. Thyrax) or small spectrum antibiotics. These are anti-stewardship measures, after which the general opinion is anger and that the industry is only after the money, that they do not care about the patients and that they do not take their societal responsibility. (R13) The same respondent (R13) further brings about the extraordinary profit margins of the industry, which is considered unacceptable, increasing the feeling they are 'a bunch of thieves'. Similarly, the head of the pharmacotherapy refers to them as 'greedy grabbers' ('graaiers'), since all they want is making money.

A pharmacotherapy coordinator (R5) indicates that the pharmaceutical industry is generally considered somewhat negative. There are several cash flows to fund research, such as via the government, European union, the Netherlands Organisation for Scientific Research (NWO), and also the pharmaceutical industry. Although indisputably an important source of funding, pharmaceutical industry money does not count as much as the other sources of money and often perceived somewhat negative.

The informal curriculum

Respondents were generally convinced about the importance of role models in education. It became clear that role models become increasingly important over the course of education, both in general and specifically regarding pharmaceutical promotion. During their bachelor, students learn the underlying mechanisms of disease rather than a specific drug that should be used for that disease. The professor in training and education (R8) explains that the social learning, of which the role model function is part, is stronger in the clerkships. Here, students are more vulnerability because they are submerged in the doctor's environment they want to be part of, and consequently easily take over the norms and standards. And if it is the norm that it is fine to be paid by the industry, that will become part of their own identity much faster.

"*I think you can formalize and educate about the industry what you want, but at the moment a professor tells a student that he's going on a 'paid holiday' to Barcelona because of a short presentation for company X, then all the education has been for nothing because that has become the norm*" (Professor in training and education)

Every faculty member functions to a greater or lesser extent as a role model. This can be the doctor in the white coat, the person giving the lecture, students' personal tutor, the physician supervising a student during his/her clerkships or research project, a prominent researcher and many more. Additionally, this diverse group of role models for students may have and communicate a different stance towards the pharmaceutical industry and pharmaceutical marketing. A coordinator of pharmacology education (R16) states that many doctors and academics take it lightly, let themselves be influenced by the industry and profit from it. On the contrary, there are also very critical people in academics, who are very important as to what can eventually be achieved.

A professor in pharmaceutical patient care (R10) indicates that it is important to have critical role models in education, and that students learn how a healthcare professional behaves with integrity. Accordingly, more attention could and should be devoted to professional and scientific integrity. It is important to discuss what is and what is not considered acceptable, and also the grey area in between that are not clearly defined and open to interpretation. The vice-dean indicates that pharmaceutical promotion is typically something that should be discussed frequently with students, that should be part of their professional behaviour. Ideally, all faculty would show to be aware of it and convey this message to students.

However, it became clear there is a diversity in opinions and interactions with the industry and how this is communicated to students. The head of hospital pharmacy indicates that many of the faculty members are practicing doctors that have relations with the pharmaceutical industry in their clinical practice. Although this is not necessarily a problem, it may be that some things seep through ('doorsijpelen') from these contacts into education (R3). A pharmacotherapy teacher states that faculty must think carefully about which perspective to show to students. The respondent already hated PSRs before ever having seen one, not because this was addressed in the formal curriculum, but because of informal communications on the hallway. An endocrinologist and BSc programme director (R14) collaborates with the pharmaceutical industry himself, but makes clear to the industry not to function as their marketing instrument. The respondent indicates also to try to convey this message to students that it is fine to collaborate with the industry on some aspects, but that they must be very critical on other aspects, including the marketing. A hospital pharmacist indicates that it is not structurally addressed, but that from time to time, attention is being devoted to pharmaceutical promotion, for example in response to certain issues raised by the media. Multiple respondents indicated that it used to be carte blanche, and that much has improved over the years.

"*I think the norm is shifting. Legislation has played a role here, and some doctors have explicitly stated not to do it anymore at all. You notice that is becoming the norm but that takes a while before that has become the norm for everybody*" (Professor in training and education)

According to the professor in education and training, this diversity in opinions may become more concerted when strict rules are made about interaction with the industry, and also when people that trespass these rules are being corrected (R8). Additionally, another important role here is for key opinion leaders (KOL). If opinion leaders in the hospital stand-up against pharmaceutical promotion and communicate this explicitly, students will take over this attitude and behaviour. This also account for faculty members, who will not so easy go against the opinion of a key opinion leader. Although these opinion leaders are present and aware of pharmaceutical promotion, respondents indicated not to think they communicate this to students.

"I think that most doctors in the hospital are aware of it, but I do not think they communicate it explicitly to students" (Vice-dean).

A pharmacotherapy coordinator (R3) does indicate that the majority of doctors involved in education will generally also be more engaged with society and very aware of their position as role models. Although maybe not advocating against pharmaceutical promotion, the respondent also considers it unlikely that they will advocate for the pharmaceutical industry.