

The employers' perspective on how PhD training affects physicians' performance in the clinic

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ABSTRACTS

INTRODUCTION: An increase in the number of MD-PhDs has sparked debate as to how physicians with PhD research training contribute in the clinic. This study focuses on the development and employment situation of MD-PhDs from Aarhus University, Denmark and on the impact of MD-PhDs in the clinic as seen from the employers' perspective.

METHOD: The study is based on a mixed methods approach using both quantitative and qualitative data. Quantitative data hail from existing statistical data and reports, while the qualitative data stem from semi-structured interviews with six executive consultants and 36 members of appointment committees, mainly from hospitals in the Central Denmark Region.

RESULTS: Quantitative data reveal an increase in the number of MD-PhDs concluding their training at Aarhus University. The MD-PhDs are employed in the public sector and, overall, their skills match the employers' demands. Qualitative data show that employers were satisfied with the skills the MD-PhDs brought to the clinic, particularly in terms of their ability to assess and use new and relevant information and to instigate a more scientific approach in the clinic. Informants from remote hospitals expressed a demand for more MD-PhDs, while other informants were concerned about how some MD-PhDs stopped doing medical research in the clinic after completing their PhD.

CONCLUSION: Overall, employers seem satisfied with the skills that MD-PhDs bring to the clinic. However, some voice concern that too much importance is attached to the PhD degree and that some MD-PhDs are not active doing research.

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In 2006, a political agreement coined "Globaliseringsaftalen" (The Globalisation Agreement) resolved to increase investment in science and research in order to strengthen economic growth and innovation in Denmark. Some of the resources were earmarked for increasing the intake of PhD students, and today the Danish universities enroll approximately 60% more PhD students than in 2006 [1]. As requested by the government, approximately 30% of the PhDs originate from the Health Sciences [1].

This development has sparked a heated debate in the field of medicine that has played out in the professional as well as the daily press. In particular, the discussion has revolved around whether the PhDs are worth the investment or if we are engaging in (costly) over-education [2-4].

However, the PhD investment is still relatively new, and scientific evidence regarding its social and scientific impact is lacking, also within the field of health. The present study is part of a larger study on the impact of a PhD degree in connection with physicians' and nurses' clinical work, and it is a first step towards obtaining a more nuanced understanding of how the competencies of MD-PhDs (i.e. physicians holding a PhD degree) unfold in clinical practice as seen from different perspectives. In the present study, we explore the employers' perspective.

METHOD

This descriptive study is based on a mixed methods approach using quantitative data as well as qualitative data.

Quantitative data collection

This part of the study was conducted as desk research (January-June 2016) based on pre-existing statistical data, figures and reports from Aarhus University (AU). We collected and analysed three sets of data as described in **Table 1**.

Quantitative data analysis

We conducted simple descriptive analyses of the quantitative data; i.e. we did not conduct comparative analysis of the data across the data sets as we did not have access to the raw data on which they are based.

Qualitative data collection

The qualitative data collection was conducted in March-June 2016, primarily in the Central Denmark Region, but also to a lesser extent in the North Denmark Region. Two interview studies were carried out: One with six executive consultants and one with four appointment committees (see **Table 2** for details).

Purposive sampling was used to select participants,

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TABLE 1

Data set	Reference in text	Full title
1	The employment report	The 2014 employment report for PhD graduates [5] ^a
2	Aarhus University's key figures	Aarhus University's key figures for PhD students 2012-2015, students 2010-2015, and students 2003 [6, 7]
3	The Graduate School of Health	The Graduate School of Health's own statistics regarding enrollment, completion time, age, and gender of the PhD students in 3 cohorts: PhD students who graduated in 2003, 2010 and 2014, respectively ^b

a) The employment report had a response rate of 46% for the 2010 cohort and 50% for the 2014 cohort; b) Unpublished material.

TABLE 2

Informants' background.

	Executive consultants	Appointment committees
Interviewed in total, n	6	36 physicians
Interviews, n	Individual: 6	Group: 4
Informants in specialities, n	3 from major medical 3 from major surgical	4 different committees covering 4 different specialities: 3 surgical and 1 medical
Employment	2 from a university hospital 4 from a regional hospital	Senior hospital physicians Clinical associate professors Head consultants Specialist consultants Heads of Degree Programme Junior doctors from hospitals throughout the Central Denmark Region and the North Denmark Region

TABLE 3

MD-PhD graduates from the Faculty of Health, Aarhus University, in 2003, 2010, and 2014.

	2003	2010	2014	Δ 2010-2014
PhD graduates at AU not incl. MD-PhD graduates from Health, AU, n (%)	–	277	413	+136 (+33)
MD-PhD graduates at Health, AU, n (%)	41	52	77	+25 (+44)
<i>Enrollment at Health, AU, incl. delay or leave of absence</i>				
Mean (± SD), mo.s [%]	47.55 (± 12.01)	46.40 (± 9.43)	47.92 (± 12.02)	+1.78 [+4]
Mean, yrs	3.96	3.86	3.99	–
<i>Time between completion of qualifying education and enrollment in a PhD programme at Health, AU</i>				
Mean (± SD), mo.s [%]	72.51 (± 49.12)	48.08 (± 37.08)	47.21 (± 42.21)	–2.81 [–6]
Mean, yrs	6.04	4.00	3.93	–
Age of PhD graduates at Health, AU, mean (± SD), yrs [%]	37.78 (± 4.26)	36.02 (± 3.55)	36.47 (± 3.47)	–0.34 [–1]
Fraction of female MD-PhD graduates at Health, AU	0.53	0.48	0.49	–0.03

AU = Aarhus University; SD = standard deviation.

and recruitment was carried out in two different manners: 1) Six executive consultants from selected wards were contacted via e-mail and then by phone. They all agreed to participate in interviews, which then took place at their office. 2) The coordinators of five selected appointment committees were contacted via e-mail and passed on our interview request to the committees. One coordinator never responded despite e-mails and phone calls, but the remaining coordinators arranged for the first author to meet with the four appointment committees for half an hour either before or after they held job interviews for residency training.

Interviews

Semi-structured interviews were carried out with 42 physicians – six individual interviews and four group interviews. All interviews were conducted by the first author. Individual interviews lasted between 45 minutes and one hour, whereas the group interviews lasted 30-40 minutes. All interviews were audio-recorded. The interview guide addressed the informant's expectations of MD-PhDs and experiences with MD-PhD in the clinic.

Qualitative data analysis

Interview data were analysed following the qualitative contents analysis approach described by Emerson, Fretz & Shaw [8]. The excerpts used (in Table 3) are meant as illustrative examples of the overall analytical themes. Excerpts were translated from Danish into English by the first author and reviewed by the second and last authors.

Ethical approval

The study was approved by the Danish Data Protection Agency (R. no. 2015-57-0002, Sequential no. 211). Approval by The Central Denmark Regional Committees on Biomedical Research was not required. All hospitals, wards, medical specialities and physicians remain unnamed in order to maintain their anonymity and confidentiality.

Trial registration: not relevant.

RESULTS

Results from the quantitative study

As for the AU in general, the number of MD-PhD graduates from the Faculty of Health at the AU rose during the period from 2010 to 2014. The increase in the number of MD-PhDs was 44%, whereas the increase recorded for the rest of AU was 33%.

The time from completion of qualifying education to enrollment in a PhD programme was reduced from six years in 2003 to three and a half years in 2014. The age of PhD graduates decreased from 38.07 years in 2003 to

36.71 years in 2014, but we have not been able to detect a significant difference. However, the decreased age of the PhD graduates may be related to the reduced time between completion of their qualifying education and their enrollment in a PhD programme. The enrollment time, i.e. the period from enrollment at Health, AU, to the handing in of the PhD thesis, remained relatively constant across the three cohorts: four years including any delay or leave of absence. Based on the employment report [5], we found that 100% of the 2010 cohort and 99% of the 2014 cohort are currently employed either in Denmark (89%) or abroad (11%). 87% of the PhD graduates who stay in Denmark are employed in the public sector, whereas 10% are employed in the private sector and 3% in other businesses. In the public sector, 64% of these PhD graduates are affiliated with one of the regions, 32% with the Danish state and 3% with other parts of the public sector. However, the majority (75%) of the PhD graduates who stay in Denmark are employed in Aarhus or the eastern part of Central Region Denmark. Only 16% are employed in others parts of Jutland, 6% in Greater Copenhagen and 3% on Funen. In comparison, 53-64% of PhD graduates from the rest of AU are employed in Aarhus or the eastern part of Central Denmark Region and between 25-27% in Greater Copenhagen. The employment report also stated that PhD graduates are much less mobile in terms of geography and workplace than graduated students who do not hold a PhD degree.

Finally, the employment report concluded that most of the requirements that PhD graduates meet in their jobs are matched by the skills they have attained in their PhD degree programme – in particular, the ability to find relevant information, acquire new knowledge, manage complex problems and work independently [5].

Findings from the qualitative study

Based on the interview data, three predominant themes were identified: Science and the critical gaze, “The cult of the PhD”, and PhDs in demand at regional hospitals.

Science and the critical gaze

The majority of informants conveyed that they expected the MD-PhDs to have achieved basic scientific research skills and did not regard having a PhD as important in connection with clinical skills (see **Table 4**, quote no. 1).

Being able to critically assess new medical knowledge – or having a “critical gaze”, as some informants called it – and being able to employ it in the clinic was, in many of the informants’ opinion, one of the primary skills that the MD-PhDs brought to the table. This skill was counter-posed with basing clinical decisions solely on previous experiences or even convention.

Several informants pointed out that a “critical gaze”

was essential in terms of conducting evidence-based medicine. The ultimate aim of evidence-based medicine, many informants stressed, was for patients to be offered the newest and very best treatment. Furthermore, many informants found the “critical gaze” exceedingly relevant in a clinical setting where complex new treatment methods are presented continuously (see **Table 4**, quote no. 2).

TABLE 4

Quotes from informants.

Quote No.	Informant	Quote
1	Executive consultant	“Clinically, no [we don’t expect them to be better]. We expect them to have a better background in terms of doing research, supervising the younger physicians to become researchers, and then we expect them to be trained in assessing new medical knowledge”
2	Executive consultant	“Well, new things turn up all the time. This treatment is better than the treatment that we used to use”. Can we count on that? The quality of it [the study], is it convincing? And another thing is being aware of whether the patients this study is based on, are those the same [patients] that we actually meet every day?”
3	Committee member	“In general you can say that whatever [type of PhD] you’ve done, you get someone who has been through a process. They gain something in terms of the other roles of the physician like teamwork and management and administration, self-dependence. It provides them with something”
4	Committee member	“They [PhDs] contribute to the boldness ... They’ve learned that a limit can be transcended because that’s what you do when you’re a scientist. You’re walking unknown territory. And that’s an important function, otherwise you’re arresting the development. So that’s something they [PhDs] bring and that they learn and something you can use in the clinic ... They raise the standard. There’s no limit as to what you can do professionally. You’re not limited by what we know now. We’ll just figure it out”
5	Committee member	“It can be difficult to make the connection between science and daily practice, but if we do research in the ward, it demonstrates that we are serious about the things we do. So [when someone is ill] we care about what is the very best treatment for them, and not just whether they can be released on Wednesday. Or that our education is based on research principles that we have developed. That makes a huge difference for our medical students to experience. And our physicians and co-workers. That this is serious. We’re not doing this for laughs. It is because it’s the best. And we want to make it even better”
6	Executive manager	“We don’t just look at the individual [applicant] – we look at the needs of the team. If the team is full of part time ... eagerly researching physicians, and they have a hard time manning their outpatient clinic, then fine, maybe we don’t need more of the same kind in that team, but rather we need what some condescendingly call water carriers, but that is wrong because they are the ones who ensure the clinic”
7	Executive manager	“Basically, I believe that a PhD degree is for those who want to keep on making a PhD [researching] for the rest of their career. And it’s not wasted on the rest, but I just think it’s overkill in terms of how they make use of it. Less would suffice ... If you don’t have to do science but only have to assess that of others ... you don’t need a PhD to do that. Far from it”
8	Committee member	“We have to regard the PhD as a basic education, and that gives us a lot [of value] in the periphery. It’s true that many [physicians] who have a PhD degree would rather work at the major places, but we’ll have to find out what we can do about that, so we can attract them ... I’m at [a regional hospital] which is in the periphery, and we have brought [research] into focus and have two PhD students now. It is important for a lot of other things in the ward. It is important for recruitment, it is important for our professional competency, it is important for research. It is important for the entire working day. It gives us so much. And maybe they [our results] won’t be distributed to the whole [world], but it means a lot especially for us at the smaller hospitals. ... In my opinion, it [having PhD students] has meant everything in the ward where I am”

Overall employers seem to be satisfied with the skills the MD-PhDs bring to the clinic, particularly in terms of assessing and using new and relevant information and instigating a more scientific approach in the clinic. Photo: Jesper Rais, Aarhus University.



Some of the informants found that the process of doing a PhD also influenced positively some of the other seven roles of physicians, especially the roles of communicator, collaborator and manager [9]. They related this influence to the circumstance that the PhDs had been in charge of their own project, which included being responsible for collecting data, working independently, meeting deadlines, collaborating with different groups of people (e.g. colleagues, patients, scientists) and managing their own time (see Table 4, quote no. 3).

Some of the informants found that MD-PhDs raised the standards and ensured constant progress in the wards by continually wondering about and questioning clinical practice (see Table 4, quote no. 4).

Similarly, some of the informants proclaimed that by focusing on and bringing attention to scientific research, the MD-PhDs acted as "role models" or "locomotives" for the rest of the ward in terms of being critical, reflective and educational (see Table 4, quote no. 5).

"The cult of the PhD"

While most of the informants felt that the MD-PhDs were committed, highly skilled and made great contributions in the clinic, some found that too much emphasis was put on the PhD degree. One executive consultant talked of "the cult of the PhD" to illustrate the way the PhD degree had by some been elevated into the only currency that mattered in medicine. He and other informants believed that while a PhD degree prompted certain skills, these skills could also be achieved in other – and less expensive – ways, e.g. by following seminars, doing administrative jobs or doing research with experienced colleagues.

In line with this argument, some argued that clinical experience should also be taken into account and that the importance of diversity in the clinic should not be underestimated; i.e. that different kinds of physicians are a considerable asset in the clinic (see Table 4, quotes no. 6 and 7).

Furthermore, many of the informants distinguished between MD-PhDs who continued to be active research-

ers after they had finished their PhD versus MD-PhDs, which an executive consultant termed "diploma PhDs", i.e. physicians who used their PhD as a shortcut to being admitted to the clinical specialisation of their choice and then stopped doing research altogether.

PhDs in demand at regional hospitals

Whereas informants from the university hospital generally felt that they had enough PhDs in their wards, many informants from what they themselves termed "the periphery" of the region called for more MD-PhDs. Basically, they believed that PhDs would raise the standards at their respective wards by bringing into focus evidence-based treatment and by making research a part of their clinical practice. The demand included not only research-active PhDs, but also the so-called "diploma PhDs" (see Table 4, quote no. 8).

However, some of the informants were skeptical as to whether more PhDs at the regional hospitals was a realistic way of doing research, especially in terms of establishing good, sustainable research environments, attracting sufficient funding and of doing without physicians in the clinic in favour for research.

DISCUSSION

This study is based on a combination of original and existing quantitative data and original qualitative data in order to gain insight into the impact of the PhD degree in connection with physicians' clinical work as seen from the employers' perspective. There are, however, limitations to the study. In terms of the quantitative data, the employment report had a quite low response rate (46% for the 2010 cohort and 50% for the 2014 cohort). The empirical data that the study is based on stems mainly from the Central Denmark Region and from selected medical and surgical specialities. Attitudes and experiences might be different in other Danish regions and within other specialities.

Overall, our quantitative study shows that an increase has been observed in the number of MD-PhDs from AU that surpasses the increase of PhDs in the rest of AU, that MD-PhDs are, to a great extent, employed in the public sector, and that, overall, the skills of the MD-PhDs match the demands of the employers. Our qualitative study largely confirmed the latter finding, as most of our informants were satisfied with the skills that the MD-PhDs brought to the clinic, especially in terms of their ability to critically assess and make use of new medical knowledge. Some informants found that the process of doing a PhD influenced several of the physician roles in a positive manner, and that MD-PhDs may affect a ward towards a more evidence based and motivated practice, demonstrating that MD-PhDs contribute in the clinic in ways that are not directly measurable.

However, our data do not indicate whether the current number of MD-PhDs is appropriate or too high or low. Our quantitative study shows that all of the MD-PhDs are employed, but does not indicate to which degree they were employed *owing to* their PhD, and our qualitative study shows disagreement among the informants as to the appropriate number of PhDs. Some (especially in the regional hospitals) expressed a demand for more MD-PhDs, while others were concerned about what they considered the too high status of the PhD degree and stressed the need for diverse skills in the clinic. While our study suggests that the regional wards make great use of MD-PhDs, international studies imply that recruiting physicians (with or without a PhD-degree) to remote areas is a general challenge [10, 11]. Furthermore, it is not only a question of attracting the MD-PhDs, but also a question of whether to centralise medical research in large, specialised units or rather spread it out regionally. Based on this small study, it seems regional hospitals could make good use of more MD-PhDs.

Some of our informants found that some MD-PhDs ceased doing medical research in the clinic after completing their PhD, turning into what one informant dubbed “diploma-PhDs”. Their experience is confirmed in a recent Danish study [12], which shows that two thirds of the MD-PhD graduates become research inactive within two years after graduation. This prompts the question of what causes some MD-PhDs to stop doing research. Further research is needed in this area.

Finally, it is worth noting that international studies, especially from the US, have long expressed concern over a looming shortage of physician-scientists, predicting an impending crisis in clinical research [13], suggesting that the continuing quality and progress in medical treatment calls for an ongoing, future-proofing focus on academic medicine.

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