

Medical graduates feel well-prepared for clinical work

Anne Mette Mørcke, Dorte Guldbrand Nielsen, Inge Trads Kjeldsen & Berit Eika

ABSTRACT

INTRODUCTION: The purpose of this study was to assess the coherence between the undergraduate medical program at Aarhus University and the foundation year.

MATERIAL AND METHODS: This cross-sectional questionnaire survey included 503 doctors graduated from Aarhus University from the winter of 2007/2008 to the summer of 2009.

RESULTS: The response rate was 73%. Approximately 73% of the respondents were in their foundation year or their first year of specialist training and 83% generally felt well-prepared. Respondents found that most of the learning outcomes of the undergraduate medical curriculum at Aarhus University are important for junior doctors. More than 90% of the respondents estimated that they were sufficiently prepared when it came to core outcomes such as history taking and physical examination. Five issues diverged considerably in importance stated and preparedness experienced: suggestion of diagnoses, initiation of treatment, pharmacotherapy, handling of own emotions and structuring of own learning. Also, 40% stated that their clerkships had only had little value in preparing them for their foundation year.

CONCLUSION: Overall, graduates felt well-prepared and characterized the education coherent. However, the study raises major questions concerning clerkships and competence in treatments, pharmacotherapy and the more personal aspects of professionalism.

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The importance of adequately preparing medical students to cope with the tasks and roles they have as junior doctors is apparent to all medical schools. Many medical schools, therefore, regularly conduct needs assessments to inform curriculum development. Accordingly, the PubMed database listed 132 needs assessments concerning undergraduate medical education from 1999 to 2009. Most of these 132 studies either asked subject specialists, medical students, and patients about the undergraduate medical curriculum, or performed task analyses. Interestingly, only five of the studies involved newly graduated doctors [1-5] and most of the internationally published needs assessments (127 of the 132 listed) therefore rely on other sources than junior doctors.

The Danish medical schools regularly conduct needs assessments involving newly graduated doctors [6-10].

An extensive graduate needs assessment was conducted by The Danish Centre for Quality Assurance and Evaluation of Higher Education in 1996 [6]. Later, a number of smaller needs assessments involving graduates have been conducted [7-10].

Though important, in these later studies, junior doctors did not give an extensive evaluation of the intended core learning outcomes nor did they assess if their undergraduate medical education had prepared them adequately for work.

The purpose of this study was to assess the coherence between the undergraduate medical program at Aarhus University and the foundation year as experienced by newly graduated doctors. The intention was to update the empirical basis for decisions concerning changes to the undergraduate and the foundation year medical curriculum in Denmark. The research question studied is how prepared and confident junior doctors feel concerning core learning outcomes.

MATERIAL AND METHODS

The needs assessment was conducted as a cross sectional survey including all doctors graduated from Aarhus University during winter 2007/2008, summer 2008, winter 2008/2009, and summer 2009; in all, 529 graduates of whom 59% were female.

We developed a draft questionnaire from the 1996 questionnaire [6]. The 1996 questionnaire could not be used as it were; some questions were no longer relevant, other questions were formulated using a discourse that has been abandoned and some questions were very complex.

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Is she well-prepared
for the foundation year
and for research?

FIGURE 1

Graduates' employment: respondents' employment status as a percentage of respondents doing their foundation year, first year of specialist training, unclassified positions, a PhD, or being unemployed, ill or on leave.

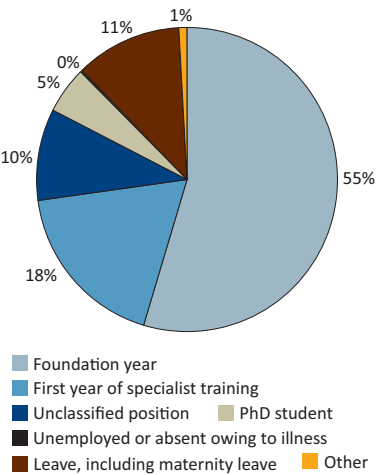
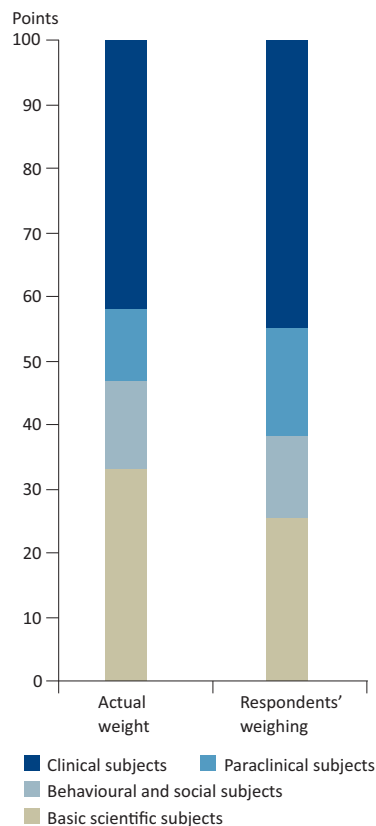


FIGURE 2

Weighting of the subject areas of the undergraduate medical program: the actual weight of the four main subject areas of the undergraduate medical program at Aarhus University in the first column. The second column shows the weights as redistributed by the respondents.



Therefore, we intermittently pre-tested the questionnaire on a small number of senior medical students and junior doctors and then revised and re-tested it until it was contemporary and sufficiently simple to answer, as recommended [11].

The final close-ended questionnaire asked respond-

ents 1) to tick off background and employment, 2) to rate how well the undergraduate medical program had generally prepared them for the foundation year and for research, 3) to weigh the subject areas of the undergraduate medical curriculum, 4) to tick off the value of clerkships and, finally, 5) to rate the importance of a number of core learning outcomes and to self-evaluate their level of preparedness concerning each of these intended outcomes. The core learning outcomes reflect the qualification frame of the medical school of Aarhus University from 2006, which consists of 23 core learning outcomes [12].

We retrieved addresses from the National Register of Persons (Folkeregisteret) with the permission and aid of Aarhus University. The Danish Data Protection Agency (Datatilsynet) permits schools to conduct surveys concerning educational questions without notification. Among the 529 graduates, 26 had left Denmark and were therefore excluded. The remaining 503 graduates were e-mailed the questionnaire in October 2009. Non-responders first received a follow-up e-mail and, finally, in November a paper version of the questionnaire was sent to their address with a return envelope.

Trial registration: not relevant.

RESULTS

A response rate of 73% was achieved (368 of 503). Among the 368 respondents, 62% were females and 38% males with a mean age of 29 years (range 25-43 years).

Employment

Figure 1 shows the distribution of the respondents' employment status. More than 50% ($n = 201$) were in their foundation year, 18% ($n = 66$) in their first year of specialist training and almost 10% ($n = 36$) were employed in unclassified positions. Five percent ($n = 18$) of the graduates were enrolled in a PhD study. Half of these had proceeded directly from undergraduate studies to PhD studies. More than 11% were on maternity leave, primarily from a foundation year position.

Respondents were employed in all organizational areas of health services and in a wide variety of medical specialties. About 28% were working in general practice, 41% in regional hospitals, 27% in university hospitals and 4% in psychiatric hospitals. Respondents were working within 28 of the 39 licensed medical specialties in Denmark with a majority in general practice, internal medicine, orthopaedic and abdominal surgery. Almost 11% were working in newly founded admission departments.

Overall preparedness for foundation year and research

Respondents rated how well the undergraduate medical

program had generally prepared them for the foundation year and for research. Concerning the foundation year, 83% (n = 304) felt well-prepared. Concerning research, 74% (n = 274) felt well-prepared. We asked respondents to specify if their education provided them with the necessary theoretical, practical and professional prerequisites for their foundation year.

Almost all respondents, 92% (338), found that they had the necessary theoretical prerequisites to a high or to some degree. But only 47% (172) found that they had the necessary practical clinical prerequisites and only 56% (205) found that they had the necessary professional prerequisites for the foundation year to a high or to some degree.

Weighting of the undergraduate medical curriculum

We listed the actual weights of the four main subject areas of the undergraduate medical curriculum at Aarhus University. These are shown in the first column of **Figure 2**. We asked respondents to redistribute exactly 100 points among the four main subject areas to "prepare students best for working as a doctor". On average, respondents weighed the subject areas as shown in the second column. A comparison shows that the discrepancies are small. Respondents would lower basic scientific subjects, such as anatomy, from 33 to 26 points, and raise paraclinical subjects, such as pharmacology, from 11 to 17 points. Both behavioural and social subjects, such as psychology, and clinical subjects, such as medicine, were weighed almost as they are in the present curriculum.

The clerkships as preparation

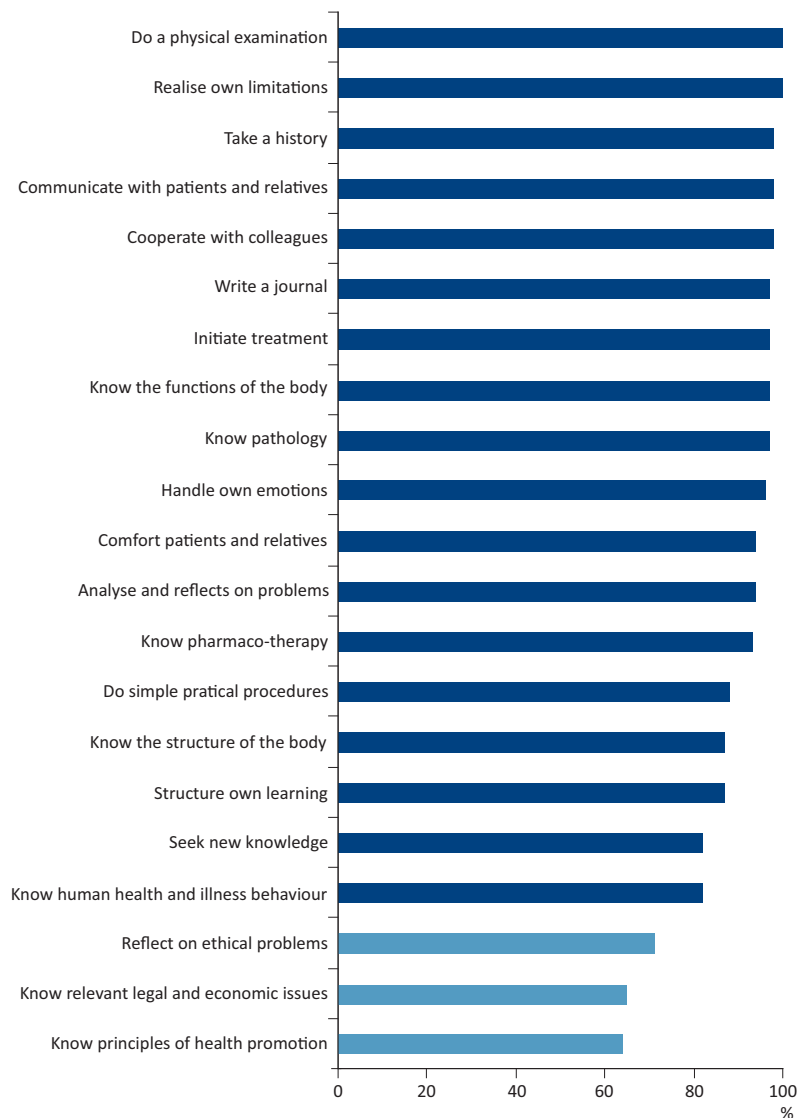
We asked respondents to evaluate the value of their clerkships as preparation for the foundation year. Most respondents, 57%, answered that their clerkships had prepared them to a high or to some degree, but 40% (n = 149) answered that clerkships had only prepared them to a small degree. The 149 respondents who gave clerkships low value could tick off as well as write free text reasons. They primarily stated four reasons: 1) the clerkships did not give them the opportunity to work independently (n = 122), 2) unclear clerkship objectives (n = 98), 3) insufficient feedback and supervision during the clerkships (n = 97), and 4) lack of commitment from the clinical departments involved (n = 88).

Ratings of the intended core outcomes and self-evaluated preparedness

Overall, respondents found that most learning outcomes of the undergraduate medical curriculum at Aarhus University were of great importance for their function as junior doctors (**Figure 3**). Only three outcomes received a lower rating with more than 25% of the respondents

FIGURE 3

Importance of the intended learning outcomes: the percentage of respondents rating an intended learning outcome an important or very important prerequisite to their function as doctors.

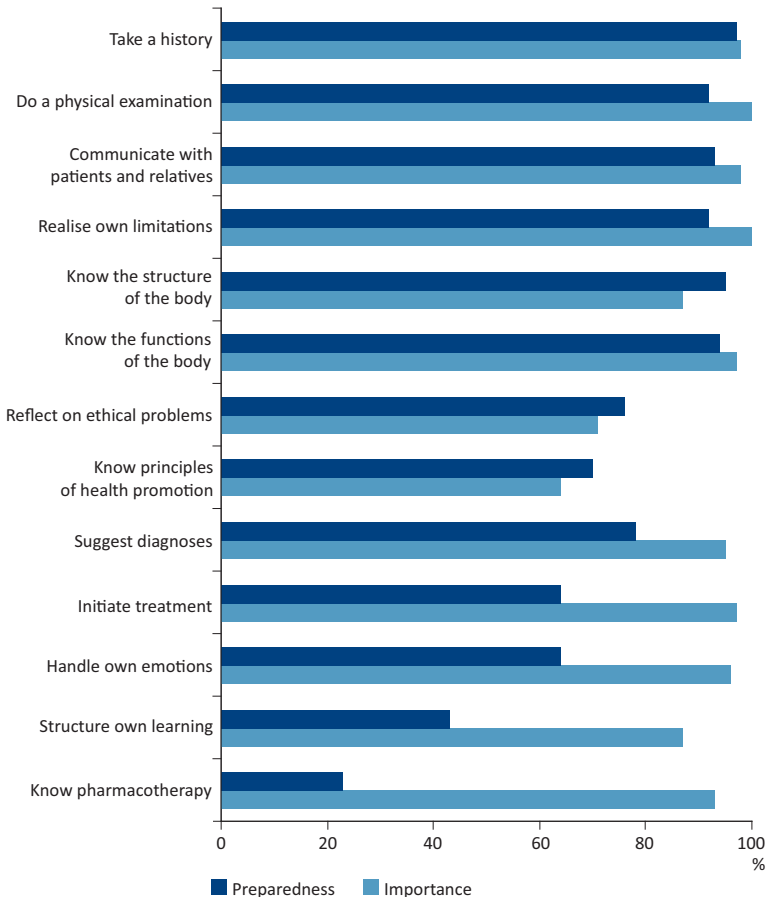


answering that the field was of no or little importance. These were knowledge of principles of health promotion, relevant legal and health economic issues and reflection on ethical problems.

There was a high degree of correspondence between the learning outcomes that were rated as having a high importance and how well-prepared respondents experienced they were on that specific outcome (**Figure 4**). Thus, more than 90% of the respondents assessed that they were sufficiently prepared for core outcomes such as history taking and physical examination, communication with patients and their relatives, realising own limitations and basic science knowledge (**Figure 4**, top bars). Likewise, 20-30% of respondents did not feel suffi-


FIGURE 4

Correspondence between perceived importance and preparedness: the percentage of respondents rating an intended learning outcome important or very important and the corresponding percentage of respondents self-assessing their competence level as sufficiently or very sufficiently prepared.



ciently prepared when it came to learning outcomes in ethics and health promotion (Figure 4, middle bars). However, five issues diverged considerably in importance given and preparedness experienced (Figure 4, bottom bars). Whereas competence in the suggestion of diagnoses, initiation of treatment, handling of own emotions, structuring of own learning and knowledge of pharmacotherapy was found to be important by respondents, their experiences of competence were lower in these fields.

DISCUSSION

Graduates from the medical school of Aarhus University generally proceed to a foundation year position and work within a large variety of specialties. This is in line with the Danish Ministry of Science's executive order BEK 338, which states that the purpose of undergraduate medical education is to qualify the students for the foundation year and give them the necessary prerequisites and competencies concerning basic scientific, behavioural and social, paraclinical and clinical subjects [13].

The coherence between the undergraduate medical program at Aarhus University and the foundation year was generally well-evaluated when comparing the actual contents and the graduates' weighting of the four main subject areas. However, 40% answered that the clerkships had only to a small degree prepared them for their foundation year. Since clerkships are essential to medical students' professional development and preparation for working as a doctor, this high percentage of respondents evaluating clerkships negatively should give reason for concern [14-16]. It seems necessary again to discuss and clarify clerkship learning outcomes, to redefine students' tasks, and to provide students with a better opportunity to work independently with sufficient feedback and supervision during clerkships. It also seems to us that the medical school, the hospitals and the doctors – together – have to re-address issues of commitment to undergraduate medical training in the very busy clinical departments of contemporary teaching hospitals.

Following this message, we wish to stress that, overall, the graduates felt quite well-prepared. They especially felt prepared when it came to the core learning outcomes of their foundation year, like history taking and physical examination [17]. Four out of five respondents felt prepared to provide suggestions for a diagnosis, whereas only two thirds of the respondents felt prepared to initiate treatment of patients.

The respondents found ethics, legal issues and health promotion to be of lower importance. We do not know why this is the case, but it raises the question whether these issues should be taught differently during the undergraduate program, later during postgraduate education, or whether there are other explanations why the respondents care less about topics so often advocated for as being essential for the society.

Graduates gave low ratings of their preparedness to structure own learning and handle own emotions. A similar result has been found in a recent British study by Brennan and colleagues, who found junior doctors "fearful" and "anxious" and, particularly, unprepared for handling the difficult emotions raised by death and dying patients [18]. Following the recent revision of the CanMed roles, the professional role now also addresses the personal well-being of the doctor [19]. It is highlighted that the doctor has a "responsibility to self, including personal care, in order to serve others". This means that part of being a true professional doctor is to be able to take care of one's own emotional health and to maintain a focus on one's own academic development. We see the findings of this study as a clear message to curriculum committees to also ensure educational activities that focus on such personal aspects of professionalism.

There is also a need to explore why junior doctors

felt so poorly prepared when it comes to rational pharmacotherapy. Is the taught curriculum too small, should the teaching format be changed, are the expectations to the junior doctor unrealistic when it comes to pharmacy or are there other explanations? These questions should be explored in order to reach a better correspondence between ratings of importance and ratings of preparedness by graduates.

Our study was a survey representing junior doctors' experience of how well the undergraduate medical program had prepared them for their foundation year. This design represents a limitation of the study as the reported preparedness is a self-evaluation and not an objective observation or assessment. Furthermore, graduates may not be able to distinguish between learning outcomes that should be taught during the undergraduate medical program and those that should be achieved during their foundation year. This could result in an evaluation of the foundation year rather than of the undergraduate program. For instance, the ability to handle own emotions and the capability to structure own learning was rated highly, but graduates did not find themselves competent. However, perhaps these learning outcomes are mainly achieved during the foundation year training where graduates should *"learn to be a doctor by actually being a doctor, feel at home in the white coat, take on responsibility, and continuously develop own abilities"* [17].

In conclusion, the graduates from Aarhus University from the winter of 2007 to the summer of 2009 reported themselves to be quite well-prepared and confident. However, the results also point out a number of areas which should be explored further. Particularly, newly graduated doctors' lower self-reported competence concerning treatment, rational pharmacotherapy, own emotions and own learning, together with their low rating of the clinical clerkships, should give reason for discussions, research and curriculum initiatives.

CORRESPONDENCE: Anne Mette Mørcke, Centre of Medical Education, Brendstrupgårdsvej 102, 8200 Aarhus N, Denmark. E-mail: amm@medu.au.dk

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CONFLICTS OF INTEREST: none

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