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One-year transitional programme increases knowledge to level sufficient for entry into the fourth year of the medical curriculum

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Abstract

Background: To cope with a lack of doctors and in anticipation of the Bachelor-Master structure for Medicine, several Dutch universities offer graduate entry programmes for students with degrees in areas related to Medicine. The graduate entry programme is a four-year programme: after a transition period of one year students enrol in the fourth year of the regular six-year training programme.

Aim: The research questions in this study were (1) whether and when graduate entry students' knowledge reached a level comparable to that of regular medical students and (2) whether there were differences in knowledge levels between graduate entry students with a university or HBO (college) degree.

Methods: The progress test results of ninety graduate entry students who were enrolled in the transitional programme between 2002 and 2004 were compared to those of regular third-year students.

Results: Initially, graduate entry students scored significantly lower on the progress tests, but differences disappeared within a year. No differences were found between graduate entry students with a university or HBO degree.

Conclusions: The results of this study indicate that the increase in knowledge after a one-year transitional period is sufficient to enrol students with related degrees in the fourth year of the regular medical training programme.

Introduction

In anticipation of the results of the discussion about a two-cycle structure in medical studies, several Dutch universities are permitting students with related university and HBO (college) degrees to enrol in higher years of the current six-year medical curriculum. The immediate reason behind this policy is a shortage of medical doctors in the Netherlands and, as a consequence, the Government's desire to educate medical doctors faster than within the regular curricula.

The University of Groningen developed and implemented a one-year transitional programme for students with a degree in an area related to Medicine. Only students who passed the selection criteria of the Groningen admissions procedure were allowed to enrol in the transitional year. The aim of the transitional programme is to increase the knowledge and clinical skills of the graduate entry students to a level sufficient for entry into the fourth year of the medical curriculum.

In this study we examined whether the one-year transitional programme was effective. The hypothesis was that students following the transitional programme are deficient in knowledge at the beginning of the programme, but that they are able to reach the same knowledge level as regular third-year students within one year. Furthermore, we

Practice points

- Students with a degree in an area related to Medicine can enrol in the fourth year of the medical curriculum after taking a transitional course.
- A transitional programme of one year is of sufficient length to increase the knowledge of graduate entry student to a level comparable to that of regular students.
- This study reveals no differences in study success between graduate entry students with university or HBO (college) degrees.

investigated whether the knowledge level of graduate entry students with a university degree differed from the knowledge level of those with a HBO degree.

Methods

Participants and admissions procedure

Participants in the study were students who followed a transitional year at the medical faculty of the University of

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Groningen and started between 2002 and 2004. Students were admitted to the transitional year if they had a secondary school diploma as required for enrolment in the first year of the medical programme and a university or HBO degree related to Medicine, such as Human Movement Sciences, Physiotherapy, Nursing or Medical Biology. Furthermore, students had to meet the selection criteria of the Groningen admissions procedure. In 2002, the admissions procedure consisted of a progress test, where students had to meet the same entry requirements as regular third-year students, and a selection interview. Since 2003, the admissions procedure has consisted of three tests: a knowledge test covering the whole area of clinical medicine, 20 questions about a paper published in the Dutch Journal of Medicine and an open-book test on several chapters of the Textbook of Medical Physiology by Arthur C. Guyton, which were announced as the subjects of the test 3 weeks before the assessment date. Early dropouts ($n=2$) and graduate students who were enrolled twice in the transitional year ($n=2$), for example due to pregnancy, were excluded from the study. As a result, the participating groups of graduate entry students can be defined as follows. In 2002 the group consisted of 25 students with an average age of 31.2 years, in 2003 the group consisted of 33 students with an average age of 28.0 years, and in 2004 the group consisted of 32 students with an average age of 26.8 years (Table 1).

Transitional year

Graduate entry students follow a transitional programme, which to a significant degree is identical to the regular third-year programme. This means that the graduate entry students like the regular students, work for four hours a week in tutor groups, practise their clinical skills for four hours a week, attend lectures, study literature and prepare assignments. In addition to this regular third-year programme, the graduate entry students have to compensate their deficiencies concerning basic theoretical knowledge by following extra lectures (provided by the faculty on their request) and studying further texts independently. Attendance at practicals in the first and second study years is optional. With regard to the previous qualifications of the graduate entry students, groups are arranged as heterogeneously as possible in order to stimulate students to learn from each other.

The graduate entry students take the same tests as third-year students; furthermore, they take an extra test concerning the basic concepts at the end of each trimester.

Students are admitted to the fourth year of the regular programme once the entire transitional programme had been finished successfully.

The progress test

Results on the progress tests were used to compare graduate entry students following a transitional year with regular third-year students. A progress test is a comprehensive knowledge test at graduate level. There is no direct connection between the test and specific course units. Four times a year, students of all year groups take the same test at the same time at three universities in the Netherlands: Maastricht, Nijmegen and Groningen (Verhoeven 2003). All participating faculties are involved in the production of the progress tests. At the time the study was conducted, a single progress test consisted of 250 true/false/don't know items on knowledge of all medical disciplines. Based on a two-dimensional blueprint, the percentages of basic science items, clinical science items and behavioural science items in each test are fixed (Van der Vleuten et al. 2004).

The Dutch progress test is a summative assessment form. Students' test scores are expressed as the percentage of correct minus incorrect answers and compared to predetermined reference scores to calculate qualifications (excellent, satisfactory or unsatisfactory). Pass/fail standards are set in consultation with the participating medical schools. A longitudinal testing procedure such as progress testing provides insight into the growth of medical knowledge of year groups as well as the position of individual students within a year group (Muijtjens et al. 2007).

During the six-year curriculum there are 24 measurement moments per student, since all students are obliged to take all progress tests. Graduate entry students are obliged to take tests 9 to 24.

The results of the progress tests of the participating cohorts were gathered. The third, fourth and fifth-year test results were available for cohort 2002 (tests 9 to 20), the third and fourth-year results for cohort 2003 (tests 9 to 16), and the third-year results for cohort 2004 (tests 9 to 12).

Analysis

In this study the average scores on the progress tests of the graduate entry students were compared to those of regular third-year students from the same year at the University of Groningen. T-tests were performed to examine differences between the two groups and within the graduate entry group.

Table 1. Biographical data of graduate entry students following the transitional year in 2002, 2003 and 2004.

Entry year	N	Gender		Degree		M Age	SD	Range
		♂	♀	Professional	Academic			
2002	25	5	20	13	12	31.2	7.24	21–44
2003	33	19	14	13	20	28.0	6.58	22–46
2004	32	16	16	7	25	26.8	5.09	22–39

Table 2. Results on the progress tests of regular, third, fourth and fifth-year students and graduate entry students in the study years 2002–2003, 2003–2004 and 2004–2005.

PT	Graduate entry cohort 2002					Graduate entry cohort 2003					Graduate entry cohort 2004					
	N	M	SD	T (df)	p<	N	M	SD	T (df)	p<	N	M	SD	T (df)	p<	
Year 3																
9	R 230	41.1	15.5	1.580 (253)	n.s.	R 289	42.5	15.0	4.380 (320)	0.001	R 326	44.4	15.3	3.004 (355)	0.01	
	G 25	35.9	16.5			G 33	30.7	11.8			G 31	35.9	13.9			
10	R 231	50.9	17.8	0.899 (254)	n.s.	R 275	58.2	17.9	2.939 (306)	0.01	R 325	42.6	16.4	-0.936 (354)	n.s.	
	G 25	47.6	14.9			G 33	48.8	12.5			G 31	45.5	13.7			
11	R 221	54.4	19.7	0.092 (244)	n.s.	R 249	59.9	19.3	1.892 (52.936) ¹	n.s.	R 312	66.8	19.6	-3.414 (41.688) ¹	0.01	
	G 25	54.0	17.4			G 32	55.2	12.4			G 31	76.5	14.6			
12	R 225	61.9	21.2	-0.823 (248)	n.s.	R 260	67.4	23	-0.450 (291)	n.s.	R 307	71.7	23.1	-3.697 (335)	0.001	
	G 25	65.5	17.4			G 33	69.2	16.4			G 30	87.9	19.8			
Year 4																
13	R 251	58.7	18.9	-0.319 (41.102) ¹	n.s.	R 312	63.0	20.5	0.068 (340)	n.s.						
	G 25	59.5	10.6			G 30	62.7	16.8								
14	R 240	77.5	20.4	-0.813 (263)	n.s.	R 282	65.6	21.5	-1.905 (310)	n.s.						
	G 25	80.3	16.6			G 30	73.3	16.9								
15	R 179	69.7	19.5	0.218 (197)	n.s.	R 233	80.8	22.1	-1.341 (258)	n.s.						
	G 20	68.7	18.3			G 27	86.7	20.7								
16	R 208	73.0	20.4	-2.594 (229)	0.05	R 229	84	23.9	-2.466 (257)	0.05						
	G 23	84.5	19.2			G 30	95.2	20.5								
Year 5																
17	R 206	80.0	21.4	-0.674 (225)	n.s.											
	G 21	83.3	19.0													
18	R 233	73.2	19.3	0.812 (254)	n.s.											
	G 23	69.8	15.9													
19	R 254	94.7	22.5	-0.939 (33.771) ¹	n.s.											
	G 23	97.7	13.8													
20	R 257	99.3	24.7	-1.313 (32.025) ¹	n.s.											
	G 22	103.9	17.8													

R = regular students; G = graduate entry students.

¹Equal variances were not assumed according to Levene's test. Therefore degrees of freedom were adjusted and differ from the values resulting from analysis based on the assumption of equal variances.

Results

Four out of the 80 participating students did not pass all tests at their first attempt. After resitting three students passed and were admitted to the fourth year of the regular programme. The remaining student did not pass, even after repeating the whole transitional year.

The results of the progress tests of graduate entry students and regular students are shown in Table 2. All three cohorts of graduate entry students scored lower on their first progress test (test 9). The differences between cohorts 2003 and 2004 and the regular third-year students were significant. At the second progress test (test 10) cohort 2003 scored significantly lower than regular students. During the transitional year graduate entry students of all three cohorts increased their knowledge and achieved the same level as regular students. The results of the third and fourth progress tests during the transitional year of the graduate entry students of cohort 2004 (test 11 and 12) were significantly higher than those of regular students. In study year 4 and 5 graduate entry students scored as high as or higher than regular students on progress tests (test 13 to 20).

The results within the graduate entry group were analysed but no significant differences were found between graduate entry students with university or HBO degrees in an area related to Medicine.

Discussion

The hypothesis that students following the transitional programme have a deficiency in knowledge at the beginning of the programme, but that they are able to reach the same *knowledge* level as regular third-year students within one year, is supported by the results of this study. Based on these findings it can be concluded that the objectives of implementing a transitional year have been achieved. Furthermore, no difference in knowledge level has been found between students following the transitional programme with a university or HBO degree. Apparently, the medical programme can be followed faster by students who have a university or HBO degree in an area related to Medicine and who follow an adapted programme, provided that they satisfy the entry requirements and the selection criteria.

In Europe, many institutes for medical education are discussing the applicability of the Bachelor-Master structure for Medicine (Christensen, 2004; IFMSA & EMSA, 2004; WFME & AMEE, 2005). Part of this discussion concerns the possibility of enrolling students with degrees in an area related to Medicine. In our opinion, the results of this study may contribute to this debate in favour of the enrolment of students with a Bachelor's degree related to Medicine in the Medical Master. We expect these students to have a broader view on the medical field because of their experiences with another university degree. However, future research is needed to investigate whether our findings will also be valid in the Bachelor-Master structure.

Data gathered in this study are based on progress test results. The advantage of using progress test results rather than regular test results is that the former are not directly related to

course units. In addition, the contents of the progress tests never depend on one single medical school as the test items are constructed in a joint venture. This means that the progress test measures the student's general level of medical knowledge. Every medical school has a progress test committee which is responsible for the production of test items. In doing so, the test construction procedure prevents idiosyncrasies resulting from a restricted group of teachers. To optimise test quality, items are extensively reviewed before they are added to a test. Draft test items are reviewed on content, relevance and wording (Van der Vleuten, 2004).

A limitation of this study is that the comparison between the two groups of students focuses on the assessment of *knowledge* level. The study results do not provide insight into the development of the clinical skills of graduate entry students. Since graduate entry students take the same clinical skills training as regular third-year students, we expect no differences with regard to their clinical skills levels. Further research is needed to reveal whether this expectation is supported in practice.

In conclusion, this study suggests that it is feasible to enrol graduates of an area related to Medicine into the medical programme, provided that they satisfy the selection criteria. A transitional programme of one year seems to be of sufficient length to increase the knowledge of graduate entry students to a knowledge level comparable to that of regular students.

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