

# Dropout risks of medical students

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## Research article

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## **Abstract**

Background The moderation of student dropout is an important aim in the medical training that requires significant resources from individual and national economy points of view. Hungarian medical training has high quality and strong international attraction, although students are exposed to significant stress in the extremely selective and strict training at the beginning, and their professional identity is being shaped between crises. Learning progress is often hampered by recurring exams and grade retentions.

Methods In our Study we are going to examine the dropout behaviour of medical students. During our research, the national higher education statistics are being analysed based on the data base of medical students who started in 2010 (N = 977). The question of research is how the rate of dropout people who has finished or exceeded the 6-year long training is forming and what kind of factors limit the risk of dropout.

Results Our results indicate that only half of the applicants get admitted to medical training. Half of the admitted applicants could continue without failing, but 30% of them could not obtain absulotorium after 14 semesters. Dropout students are characterized by the early slow-up of their credit accumulations and by making their status passive, which is the shorter-longer termination of their studies. 83.6% of students started in 2010 has been studying in state financed course, and 8% of them has been studying in a self-financed course. 9.4% of state-financed students were dropped out while this rate was 50% from the self-financed course of students.

Conclusion According to our consequences, dropout risk can be increased by low credit numbers, passive semesters and the tuition-based financing forms, although dormitory placement can be an advantage.

## **Background**

The field socialisation of future doctors, the process of the shaping of their professional identity, and identifying the factors which support this process, are all important research topics. Another important question is whether medical students' successful identification with their future role is determined by their social and demographic characteristics or by the circumstances of their medical studies [16]. Insufficient field socialisation can result in dropout from a medical course, individual abandonment of the profession, or a shortage of doctors if this occurs on a wide scale. The difference in student dropout rates between course fields draws attention to the fact that those who choose different fields are affected by diverse factors when it comes to deciding whether to terminate or continue their studies. The early formation of professional identity is strengthened by attachments to disciplinary values and relationship networks, as well as the high level of admission requirements and the favourable positional possibilities. These factors can limit the proportion of dropout students [18, 19].

At the turn of the millennium, in order to respond to the emerging doctor shortage, the UK government increased the number of students admitted to courses and initiated special development and examinations to encourage their retention [5]. In other countries the incline of the dropout of medical students was examined in relation to the effects of the change in the structure of higher education, and it was stated that a temporal distortion of studies increases the risk of dropout [6]. High school results, admission scores and year of

admission were proved to be good predictors of the likelihood of students graduating, and the admission score indicated in advance whether studies would be completed within a curriculum period [7]. However, longitudinal analyses came to the conclusion that the increase in the dropout rate can be explained by admission politics, the structure of the higher education curriculum, the proportion of theoretical and practical courses, and the increasing tuition fees [5, 8, 9]. Dropout is further influenced by the hardships caused by educational costs, the negative effects of taking jobs while studying, and the fear of being in debt due to course fees financed by loans [10, 11, 12, 13]. The effective ways of limiting dropout were the organised study support provided for students (frequent formative ratings, study methodology courses, group studying), an increase in the proportion of practical, problem-based study, and counselling to deal with time-management and stress [14].

There are many education systems around the world that feature tuition fees, peer sharing, and student and family contributions to peer support. Most European systems provide university education, with or without tuition. There is a significant level of indebtedness among early-stage doctors in fee-paying courses. At the same time, dropping out in all systems results in a severe loss of resources, and prolonged studies have a negative impact on the mental health and commitment of medical students and other health science students.

Although in Hungary higher education is financed by the state and tuition is free, 40% of BA students still leave higher education without a degree. A qualitative research study in 2018 examined those students who had started a course more than 10 years ago but did not graduate. Three significant groups of reasons lay behind their dropout: most of them dropped out due to material reasons, because the student and his/her family could not handle the travel and living costs of higher education. Others stated that learning hardships, the negative attitude of teachers and administrators, the lack of a helping hand and a lack of information caused dropout. According to the third group, the reasons for dropout were disillusionment with their major or institution, and the disappointment in practical experiences when compared to their expectations [16].

In the medical course in Hungary no multi-cycle courses were introduced, unlike other areas who joined the Bologna process at the turn of the millennium. So, for example while in Economics courses, combined BA and MA courses of 3+2 years were introduced, on the medical, legal and theology courses the single-cycle educational structure was retained. Teacher training courses became two-cycled in 2006, and in 2013 the combined course in this area was also redesigned. So future doctors study for 6 years to obtain a diploma. They start their internships and resident years after this so they can take their medical specialist exam at the end of their 3- to 5-year medical course. The extremely long course means students are held back in the process of becoming self-sufficient and starting a family. Optimistic future expectations are demolished by the high level of requirements, the extremely difficult studies and the high proportion of unsuccessful exams. The inadequate tempo of graduating causes labour shortages in certain areas, which is swelled by graduates quitting, going abroad and by the aging of the medical profession [1, 15]. In the outstandingly costly medical course, 20% of dropout represents a significant waste of resources on an individual and international level [3]. In the medical course in Hungary there are currently 3 groups of students, divided according to the financing of their course. Hungarian nationality students are financed by the state if they achieved the required scores at admittance and if they have not exceeded their limit of 7 years. Only some students who are on their

second degrees or who did not achieve the necessary admittance scores study on self-financing courses, but these are only wealthy individuals. Most of the foreign students who come from European and Asian countries study on self-financed courses in the English language. The third group of students includes foreign students from poor countries outside Europe on the Stipendium Hungaricum programme, whose studies are financed by the Hungarian state with scholarships. The topicality of our research is that the system of financing based on a student's academic record was introduced in 2015 for Hungarian medical students who up to then had been studying free of charge. This new system monitors the academic development and grades of students, and those whose academic average does not reach 3 out of 5 or who do not get 36 credits a year lose state finance and have to pay 8,000 Euros annually, to refund their costs. Given the average income of families, this can mean a significant growth in dropout.

## Methods

The aim of the research is to examine the dropout behaviour of Hungarian medical students in the educational structure before the reform. The majority of research studies dealing with medical students have been based on examinations with low case numbers and which use questionnaires, and often they analyse samples relating to one or more institutions. In this study we analyse data from anonymous individuals on the higher education database [3, 4]. These anonymised data are collected with statistical aims, accumulated and stored on a higher education information system. In this analysis we focus on the progress of students from four Hungarian universities who started in 2010. The examination of the anonymised individual higher education database provided us valid information in some samples about the progress of students. During the analysis we worked with the following variables: gender of the student, age of the student, whether the student lived in a dormitory, the categorised variable of the number of years of 'passive status', the form of finance and the numbers of credits obtained.

During our research we used description analysis, where we examined proportions in the case of continuous variables, while in case of discrete variables we examined and compared frequency. In order to explore the reasons for dropout, we carried out binary logistic regressive analysis, during which we applied the Forward Wald method.

We regarded  $p<0.05$  as a significant result. Analyses were done with the IBM SPSS Statistics 25.0 program package (SPSS, Chicago, IL).

## Results

On the general medical courses in Hungary the number of applicants and participants is quite stable. We can state that the chance of being accepted, considering the proportion of first choice applicants and participants, is quite low compared to other combined courses (i.e. courses which combine a BA and MA level programme), as it is usually around 50%. The peculiarity of the 6-year combined course is that it has dedicated applicants. In the case of an unsuccessful application, 75–76% of the applicants put the same course in the first place on their form when re-applying. In the combined dentist major this rate is 40–45%. Two thirds of applicants who make the course their first choice also make it their second choice. What is more, every second choice applicant puts this course in the third place, too—only at a different institution.

Selection can basically be diverse in terms of institutional preferences, knowing that the major can only be taken on a full-time course and the majority of applicants and those accepted will start their studies on state-financed courses (Table 1).

Table 1: The number of applicants and those accepted on medical majors (2010-2017)

Year	All applicants	Of these: state-financed	Of these: applying for their first choice	Accepted	Of these: state-financed
2010	2772	2761	2098	1046	982
2011	2815	2782	2144	1066	989
2012	2958	2929	2208	1155	1113
2013	2476	2454	1859	1148	1127
2014	2839	2818	2159	1068	1064
2015	2950	2929	2249	1073	1058
2016	2927	2910	2189	1022	986
2017	2780	2763	2089	1029	983
2018	2722	2704	2087	1029	1025

Source: data of general processed applications

[https://www.felvi.hu/felveteli/ponthatarok\\_statisztikak/elmult\\_evek/!ElmultEvek/index.php/elmult\\_evek\\_statisztikai/](https://www.felvi.hu/felveteli/ponthatarok_statisztikak/elmult_evek/!ElmultEvek/index.php/elmult_evek_statisztikai/)

Although, as we mentioned above, more people are studying on medical courses as numerous foreign students attend medical courses in Hungary, typically they are admitted through a special application process. In the year 2017/18, for instance, 52.8% of the 12,400 medical students in Hungary were foreign. The number of medical students coming from outside Europe who receive a Hungarian scholarship on the Stipendium Hungaricum programme, is growing dynamically, from 146 in 2017 to 297 in 2018.

A quarter of students accepted in Hungary drop out during the course. This is proven by the data which show the number of those who graduate between 2015 and 2017. The number of certified doctors is between 1200 and 1400, and the number of those who are not foreign is 450–750 (Table 2). If we compare this to the number of those mentioned above, then we can still see the difference clearly if we know that the proportion of those on medical courses finishing outside the prescribed course time is high.

Table 2: The number of those finishing the general medical major (2015-2017)

Year	Number of students participating in the final examination	Number of those officially finishing	Foreign students
2015	1188	1287	450 (35%)
2016	1374	1371	531 (39%)
2017	1406	1406	618 (47%)

Passive semesters have a pre-indicating role in dropout, as during this period students stop their studies. While only 12% of those who finished their studies had 1 or 2 passive semesters, the corresponding figure for dropout students was 60%, and 21% of these had even more passive semesters.

Medical training is rather expensive—currently it costs 8,000 Euros (it was 5,000 Euros in 2010). It is no coincidence that few people can take self-financed courses, and very few people apply for these as their first choice. One group of those applying had so few points as a result of their high school studies, that they could only apply to self-financed courses, so in 2010 8% of students started on self-financed courses. In every second choice course students stay with self-financing, while those who have good results can apply for a state-financed course - at least for a period of their studies. Of those applying in 2010 only 8% who started on state-financed courses transferred to self-financed courses. Those proportion of those who stayed on state-financed courses was only 83.6% in 2010.

There is a significant relationship between dropout and forms of finance, and any change in the form of finance (Pearson Chi<sup>2</sup> p<0.001). The dropout was 63.4% - compared to the average of 15.5% - amongst those students who remained on self-financed courses, while it was 9.4% amongst those who remained on state-financed courses. The dropout is higher among those students who transfer from state-financed to self-financed courses, although the coherence between the two variables does not necessarily indicate a cause-effect relation as there can be financial and educational hardship present in the background, as well.

The examination of student success is very interesting based on our database (Figure 1). We can see that dropout is the lowest (8% and 9%) from state-finances courses, and the highest (56% and 63%) from self-financed courses.

Figure 1: Academic success of students belonging to certain financing groups

In order to test our hypothesis, we used a binary logistic regressive model on our data, in which the dependent variable was whether someone dropped out or not, while the background variables were those which had a significant relationship with dropout. We considered the following: gender of student, age of student, whether he/she lived in dormitory, the categorised variables of the number of passive semesters and the form of finance. Besides, we used the number of credits as a continuous covariate variable.

By applying the Forward Wald method, we obtained a model in which the form of finance and its change did not increase the chance of dropout. Academic factors - the number of credits and passive semesters - proved to be a significant model-forming variable: a higher value of the former decreased the chance of dropout, while a higher value of the latter increased it.

Table 3 (Model 1): Results of the binary logistic regression

Variants	B	S.E.	Wald	df	Sig.	Exp(B)	Reference class
1-2 passive semesters	2.303	.496	21.536	1	.000	10.008	none
3 or more passive semesters	2.950	.645	20.952	1	.000	19.110	none
Credit value	-.031	.003	81.927	1	.000	.969	continuous variable
Constant	2.909	.486	35.885	1	.000	18.342	

Our model was also tested in such a way that we did not enter the number of credits in the system. In this case, besides the number of passive semesters, the self-financed status and a transfer to it (except for 'self-financed then state-financed status, too' p = 0.197) had a great influence on dropout. In this model staying in

a dormitory appeared as a preventive factor: those who lived in a dormitory during the course had less chance of dropout.

Table 4 (Model 2): Results of the binary logistic regression

Variants	B	S.E.	Wald	df	Sig.	Exp(B)	Reference class
Self-financed throughout	2.425	.415	34.153	1	.000	11.303	State course throughout
State-financed, then self-financed, too	1.213	.305	15.840	1	.000	3.362	State course throughout
Self-financed, then state-financed, too	-.848	.657	1.668	1	.197	.428	State course throughout
1-2 passive semesters	2.387	.249	91.853	1	.000	10.883	none
3 or more passive semesters	2.950	.645	20.952	1	.000	19.110	none
Lived in a dormitory	-.665	.271	6.046	1	.014	.514	none
Constant	-3.161	.212	221.821	1	.000	.042	-

## Discussion

International literature rarely deals with the problem of dropout among medical students, although due to the long course and the high course costs, serious human and financial resources are at stake. In our study we highlighted some notable experiences from a longitudinal examination of students entering medical courses in 2010. On Hungarian medical courses students who have outstanding academic results and are dedicated can be accepted, and there is no other higher education course which has such a varied social make-up. Statistical analysis shows that only half of the medical students starting in 2010 could graduate within the prescribed time frame. Only 70% of the students could obtain an absolvitorium by the time their state-financed semester had ended. More than four fifths of the examined sample had been studying in a state-financed form throughout their course. There were few students—only 8% - who took the opportunity of paying 5,000 Euros at the beginning of their studies via the self-financed course, a fee which is truly high when compared to wages in Hungary. Only 8% of those examined changed to a self-financed form during their 14 semesters despite the fact that they had started their studies in the state-financed form.

Dropout is characterised by an early and marked slowing of the accumulation of credits, and by application for passive semesters. Slow credit accumulation indicates problems in academic performance, since after failing a subject it is not possible in the medical course curriculum to take up the next subject if it is based on the failed one. Due to academic problems and slow credit accumulation, during the first two years students are further selected, and one third of dropouts leave the course at this point. In our samples, dropout is really low amongst students on a state-financed course in all active semesters, where only 9.4% stopped their studies. In spite of this, 63% of those on self-financed courses and 56% of those who transferred to self-financed courses dropped out.

Based on the student data in the database we carried out a multi-variable analysis in order to identify the factors that most influence the chance of dropout. The logistic regressive models confirmed that a dynamically collected number of credits in the examined sample decreased the chance of dropout, while a higher number of passive semesters increased it. These two factors are not fully independent from each other, since an application for a passive semester basically means a failed exam, so the system can filter out

those who have academic problems. Finishing studies in the state-financed form was itself a factor that increased the possibility of dropout in the 2010 sample, despite the fact that it affected very few students.

## Conclusion

Hungarian medical students enter their courses with high point numbers and dedication, but still every second student only graduates outside the prescribed course time, and one third are not able to obtain an absoloratorium by the end of the course. On medical courses dropout is increased by low credit numbers and passive semesters, and by the self-financed form, although staying in a dormitory can be an advantage, as it limits the costs of an education and the student can gain social capital that can support him/her in better academic performance.

The obstacle to our examination is that after examining the significant database we only obtained information relating to the graduation of one sample. One-third of them still continued their studies after the closure of the database, and their results are unknown. We could have made further important connections by examining levels of academic achievement, but based on the database we can only draw conclusions based on unsuccessful course performance, and we do not have data about academic achievement in the current higher education system. Since filtering on the basis of academic achievement means making a new selection and the cost of this is really high, the restrictions for those who enter the system after reform may bring radical changes. It is important to examine the effect of any change in the future, as well.

## Abbreviations

*BA*: Bachelor of Arts

*MA*: Master of Arts

*UDCC REC/IEC*: Regional and Institutional Ethics Committee. University of Debrecen. Clinical Center

## Declarations

### Ethics approval and consent to participate

The *UDCC REC/IEC* committee of the University of Debrecen approved the study. An information letter was sent to the participants and in absence of specific opposition, consent was considered to be obtained.

### Consent to publish

Not applicable.

### Availability of data and material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

## Competing interests

The authors declare that they have no competing interests.

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## Authors' Contributions

GP conceived the study, wrote the research protocol and the manuscript. SZMD wrote the questionnaires, recruited the students, organized the data collection, reviewed the paperboards and assisted in writing the manuscript. ED analysed the data, performed the statistical analyses and assisted in writing the manuscript. MSZ ensured the feasibility of conducting the study and also assisted in writing the manuscript. All authors read and approved the final manuscript. Guarantor: GP.

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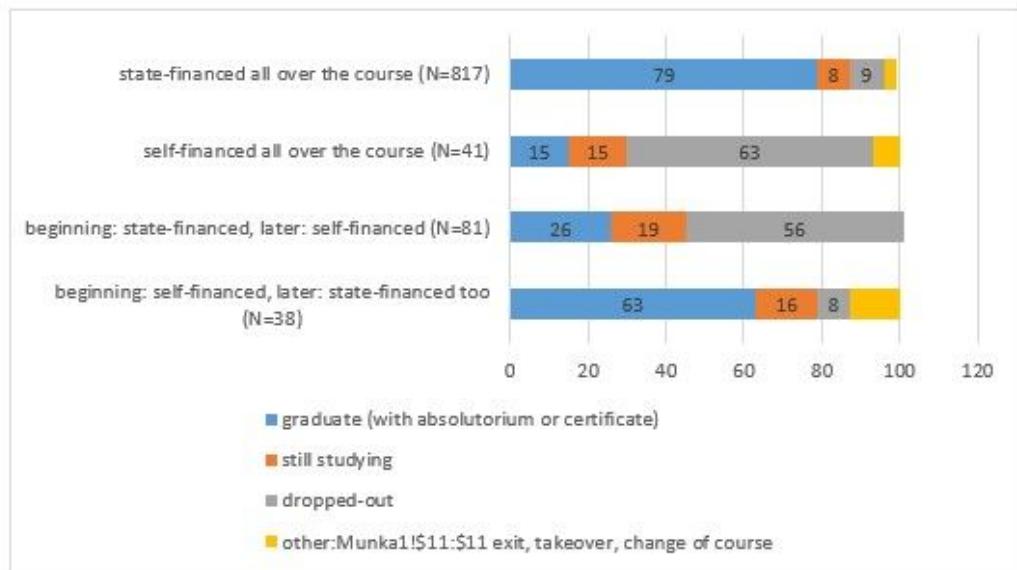
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## Figures

**Chart 1: Scholastic success of students belonging to certain finance groups**



**Figure 1**

Scholastic success of students belonging to certain finance groups