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'Did I pass the licensing exam?' aspects influencing migrant physicians' results: a mixed methods study

Linda Sturesson , Andreas Heiding, Daniel Olsson, Terese Stenfors

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Department of Learning, Informatics, Management and Ethics, Karolinska Institutet, Stockholm, Sweden

Correspondence to
Ms Linda Sturesson;
linda.sturesson@ki.se

ABSTRACT

Objectives Migrant physicians (MPs) who wish to practise their profession in a new country often must undergo a recertification process, including a licensing exam. In many cases, this is the same licensing exam used for peers educated within the country; however, the pass rate of MPs is usually lower. This study aimed to explore MPs exam results, focusing on MPs that had participated in a complementary programme (CPP) for physicians with a medical degree from outside the European Union/European Economic Area (EU/EEA), and aspects that may influence these.

Methods Mixed methods were applied. The data consisted of 2013 to 2019 licensing exam results of 564 physicians in Sweden that were educated outside of the EU. The data was analysed using linear and logistic regression analysis. Further, 14 interviews with MPs were conducted and thematically analysed.

Results An interaction between age and CPP participation was found for both the total score in per cent (p=0.01) and for the proportion failing their first attempt (p=0.04). Age was found to be a very strong predictor for failing on the first attempt, with those 45 and older failing on the first attempt in 72 and 82 per cent for CPP and non-CPP participants, respectively. Interview data was categorised into two themes: preparations and biographical aspects, and the exam and exam situation.

Conclusions Age seems to be an important predictor for failing the first attempt. MPs have had less time to familiarise themselves with the exam type and the language used on the exam. To improve exam results, MPs used different strategies and tools, that is, studying with nationally trained physicians, and using old exams and a web-based study tool consisting of common exam subjects. At the same time, these strategies and tools have also become mediators in the socialisation of MPs into the exam context.

Strengths and limitations of this study

- ► This study links exam data from all licensing exams taken in Sweden by physicians educated outside the European Union (EU) for the last 7 years with data on complementary programme (CPP) participation enabling for the first time a comparison between CPP participants and non-participants.
- ► Mixed methods enable a deeper understanding of the question and the test results.
- ► The respondents were diverse with respect to age, gender, reason for migration, country of origin and medical degree, and performance on the exam.
- ► Sixty per cent of the interview participants passed the licensing exam on their first attempt, which might limit the data needed to identify difficulties and barriers; however, this success rate is congruent with the overall success rate on the exam for physicians educated outside the EU.
- ► Some migrant physicians might have taken the exam before the years included in the study, this is however unlikely for the subgroup of CPP participants.

INTRODUCTION

Migrant physicians (MPs) who wish to practise in a new country often must undergo a recertification process, including a licensing exam. In many cases, this is the same licensing exam used for peers educated within the country.[1–5] However, the pass rate of MPs is usually lower. This delays their licensing, which has negative effects on both MPs and on the new country in need of physicians.

Studies from Australia, Canada, the UK, the USA and Sweden have shown a considerably lower success rate on exams for MPs than for nationally trained physicians.[1–6] These exams include those mandated before receiving a medical licence and those required for specialist/postgraduate training.[1–3 7 8] In Sweden, over 30% of MPs with a medical degree from outside the European Union/European Economic Area (EU/EEA) fail to pass the licensing examination on the first attempt, while the corresponding figure for nationally trained physicians is approximately 3%.[3] (unpublished, Olsson, Östergren, Carlborg, AT-provet. Läkartidningen 2020) Thus, more than 10 times more individuals fail in the group of physicians educated outside EU.

Potential reasons for such lower pass rates can include lacking financial resources and/or the time needed to study,[2] not being able to prepare or to the information given before taking the test.[5] Lower pass rates can further be due to language difficulties[3]—specifically,

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some MPs require more time to sufficiently understand exam questions when they are written in an unfamiliar language.[4] Other language-related reasons for lower pass rates include insufficient communication skills[2] or misinterpretation of feedback.[5] Differences in educational traditions,[3 8] in training practices[2 4] and in examination format[2 5] are also suggested influential factors. Likewise, taking the exam in a new healthcare culture, one which differs markedly from those to which the MPs are accustomed, can also adversely influence pass rates.[3] Lower pass rates may also be related to insufficient knowledge in medicine,[3] lower self-esteem and/or cultural competency issues.[2] Some associations have been observed between age and exam performance, with older MPs often performing worse on the exam.[6 9] For example, in Sweden, there is a large age difference where MPs educated outside EU/EEA are approximately 6 years older on average.[3] (unpublished, Olsson, Östergren, Carlborg, AT-provet. Läkartidningen 2020) Whether this is connected directly to age or is actually a consequence of factors indirectly related to age—for example, having a family—is currently unclear.[6] Country of birth, native language and country of medical education are also mentioned as predictors of relative pass rates among MPs, as is the length of professional experience in the native country.[6] Regarding the latter, longer professional experience in the native country can decrease the pass rate of MPs in the new country.[6] There are also concerns that the examinations may be discriminatory[2] or unfair in that the exam format favours nationally trained physicians;[10] accordingly, lower pass rates may be attributable to test bias.[cf.[11]]

MPs with a medical degree from outside the EU/EEA often must undergo a mandatory medical internship (MMI) with a duration of 18 to 21 months before taking the licensing exam. Previous to the MMI, many MPs participate in a complementary programme (CPP) with a duration of 10 months. Between the CPP and the MMI, many MPs work in Swedish healthcare as junior physicians.

This study aimed to (1) explore CPP participants' exam results in comparison to those from other MPs with a medical degree from outside the EU/EEA and to (2) explore aspects that may influence the exam results of MPs undergoing the recertification process.

As the globalisation has increased, so has the migration of physicians between countries. Our results may shed light on reasons for MPs lower pass rates which is a widely spread pattern in different countries.[cf.[6]] An in-depth understanding of these topics can be used to develop interventions that support MPs and accelerate the process of obtaining a medical licence for practise. MPs can after having obtained the medical licence increase the workforce and also proceed to specialist training. This is important as there are shortages of practising physicians and medical specialists in many countries, and MPs have lower levels of distress if being in the specialisation phase rather if being in the re-certification phase.[12] Work is also an indicator for integration.[13 14] Both work[15 16] and integration increases well-being.[17] The medical workforce should also reflect the diversity in society at large.

MATERIALS AND METHODS

The study approach was based on quantitative analysis of exam results and qualitative analysis of semi-structured interviews with MPs.

Participants and variables

MMI exam results from 2013 to 2019 were collected from the MMI exam board. This period was chosen since the CPP participants then could have reached the MMI exam. The data included all exam participants with a medical degree from outside the EU. This study focuses on comparing a subset of physicians who participated in CPP with those who did not. CPP participants were identified via registry data provided by the universities giving the programme.

Potential study participants for interviews were identified via the CPP for physicians with a medical degree from outside the EU/EEA. An email invitation was sent in June and September 2019 to all potential participants between 2012 and 2016 (n=278). The invitation included information about the study, such as the inclusion criteria. In total, 20 potential participants responded to the invitation, and of these 14 were later interviewed during June until September 2019 (one person did not fit the inclusion criteria, while five did not respond to a follow-up invitation). The interview guide (online supplementary appendix A) was based on earlier research regarding MP exam performance[4 10] and included themes such as language skills, experiences related to discrimination and differences in medical education between countries. The interview guide was gradually refined during the interview process. The interviews were conducted one-on-one with the respondents, either in person at a quiet location convenient for them or over the phone. The interviews were conducted by the first or second author, a female PhD student and a male medical student, respectively. The medical student received interview training during the project, while the PhD student was already an experienced qualitative researcher. The researchers in this study had no previous relationship with any of the respondents. The interviews were recorded and transcribed verbatim.

Data analysis

The quantitative analyses focused on comparing CPP participants with those that did not participate in this programme. The inclusion criterion for the CPP subgroup was to have acquired at least one-half of the credits awarded by the programme. For categorising world regions United Nations geographical regions categorisation was used.[18] P values over 0.05 were considered significant.

A linear regression model was fitted to assess the combined effects of potential predictors on the total score in per cent. The final and parsimonious model

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included age and CPP, where age was modelled using a restricted cubic spline function with a knot at 35 years of age and boundary knots at 26 and 58 years of age, respectively. The model also included an interaction between age and CPP. This model is illustrated graphically, which motivated an analysis where age is categorised into three groups, under 30, 30 to 44 and 45 years and older, still including CPP and an interaction between the two variables in the model. This model was also fitted using a logistic regression model with proportion failing the test at their first attempt as the outcome variable. Boxplots are also presented to descriptively illustrate this interaction. For the statistical analyses, R 3.6.1 was used.

Qualitative thematic content analysis was performed as described by Patton.[19] The complete data set was reviewed in its entirety multiple times in order to identify potential themes.[19] The analytical process that followed was inductive: The identified meaning units were condensed and coded, after which they were arranged into themes and subthemes. The transcribed interviews were read and meaning units identified separately by the first and second authors, who then compared and discussed their findings. Furthermore, the classification into themes and subthemes was discussed and reworked several times in collaboration with the fourth author as understanding of the material grew. Different categorisations were attempted in order to identify which was the most representative of the material with the least overlap between themes. Excel software was used to manage the qualitative data.

Patient and public involvement

No patients involved.

RESULTS

During the period, 564 individuals with a medical degree from outside the EU took the MMI exam. The results based on the quantitative data are presented first and then follows the results based on the qualitative data.

Quantitative results

Descriptive statistics

Table 1 describes the participants in the outside EU group and specifically compares the CPP participants to the non-CPP participants. The CPP participants are slightly older, have slightly higher percentage males, slightly lower scores on the first attempt and a higher percentage fail on their first attempt on the test.

Regression analysis

A linear regression model with the total score in per cent as the outcome variable was estimated. Gender was not a significant predictor, neither was geographical region. Years since graduation was significant univariately, but after also including age in the model, it was no longer significant. The final model included age which was modelled using a spline function and CPP participation and their interaction as independent variables in the model, which is presented graphically in figure 1. This shows a strong association between age and the total score.

There also appears to be an interaction between age and CPP participation. CPP participation seems to be negatively associated with the total score for participants approximately between 30 and 44 years of age, while being positively associated for both younger and older participants. CPP participation may be mitigating the negative effect of age on test scores for the older participants. In a model were age was categorised at 45 years and older versus younger than 45 years, this interaction was found to be significant (p=0.01). This interaction was also present in a logistic regression analysis with failing the first attempt as the outcome variable (p=0.04). The interaction is also illustrated descriptively using boxplots in figure 2.

Age seems to be an important predictor for failing the first attempt. Among CPP participants aged 45 years and older 72% fail their first attempt and among non-CPP participants 82% fail their first attempt. For those 30 to 44 years of age the corresponding figures were 45% and 31%, respectively, and for those under 30, these figures were 12% and 19%, respectively.

Qualitative results

Table 2 presents demographic data of the interviewees. We categorised our findings into the themes *preparations and biographical aspects* and *exam and exam situation*. The related subthemes are presented in table 3.

Table 1 Exam participants with a medical degree from ouside the EU and their first attempt on the exam: failure rate, total score, age and gender.

Group	Number of individuals who attempted the exam during the years 2013–2019	Number that failed on the first attempt (%)	Mean of the total score on first attempt	Mean age	Percentage males
Outside EU (total)	564	356 (63)	66	37	49
Outside EU (CPP)	230	100 (43)	65	38	52
Outside EU (other)	334	102 (31)	67	36	46

CPP, complementary programme; EU, European Union.

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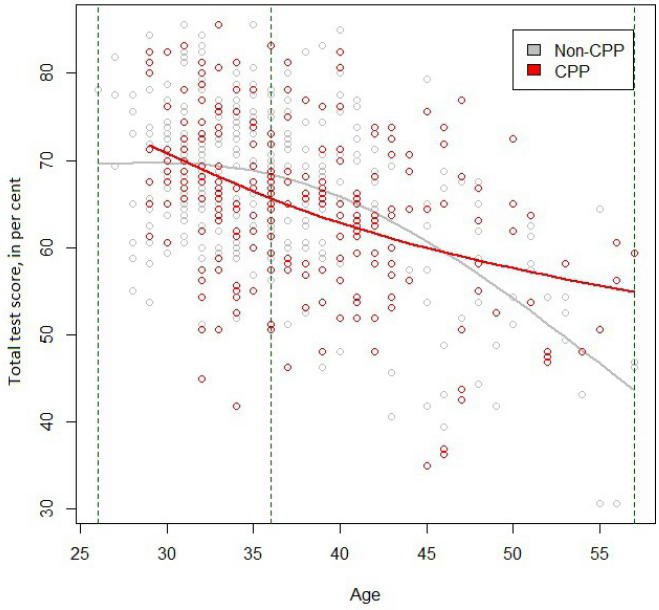

Figure 1 Linear regression model for the total score in per cent as a function of age and CPP participation. CPP, complementary programme.

Preparations and biographical aspects

The findings related to preparations and biographical aspects that were considered to influence the exam results are presented in this section, categorised into subthemes.

Old exams and a web-based study tool

Being able to practise on similar questions and exam formats was mentioned as important for succeeding on the exam. Different reasons were stated for why using previous exams in the study process positively impacted the exam results: it helped the participants to familiarise themselves with the format of the exam; it helped them to focus on relevant topics; or it gave them a better understanding of how they should express themselves when answering the questions. In addition to studying for the exam with previous exams, a web-based for-profit study tool was often used. This tool contained old exams, study guides and the hundred most common topics on the exam.

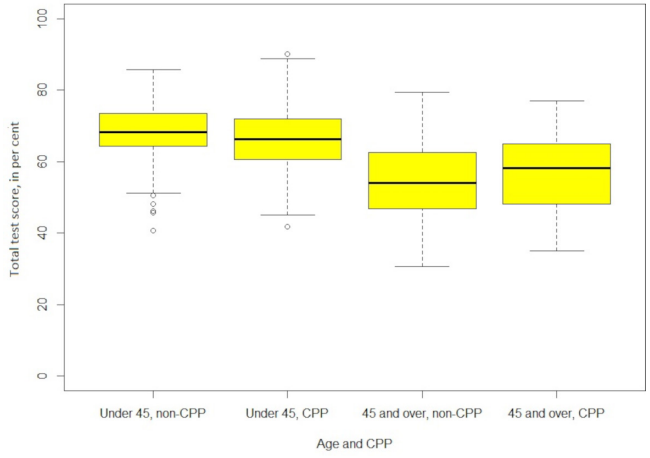

Figure 2 Box plots for the total score in per cent. CPP, complementary programme.

Table 2 Demographic data of the interviewees

Category	Number
Gender	
Female	8
Male	6
Age	
Minimum	29
Maximum	58
Mean	36
Geographical region for medical degree	
Eastern Asia	2
Eastern Europe	3
Middle East	4
South America	5
Arrival year in Sweden	
<2006	1
2007–2009	3
2010–2012	5
2013–2015	5
Passed the exam on attempt number	
First	9
Second	4
Third	1

Mentors and colleagues

Colleagues who had already taken the exam as well as other physicians educated in Sweden who were preparing for the exam at the same time as the participants influenced

Table 3 Influential aspects: themes and subthemes

Theme	Subtheme
Preparations and biographical aspects	Old exams and a web-based study tool
	Family and friends
	Mentors and colleagues
	Time passed since medical school
	Expectations and pressure to perform
Exam and exam situation	Exam situation
	Exam design
	Exam content
	Understanding the language used in the exam
	Expressing oneself in a foreign language
	Time and energy spent translating

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the ways in which exam preparation occurred. One MP had a sibling who had taken the exam and who had told the MP to practise on old exams. Another MP found that studying together with a nationally educated physician was a central for success. This MP succeeded on the third attempt—in contrast, on the first two attempts, the MP had studied with other foreign-educated physicians. The nationally trained physician helped the MP to understand which concepts, topics and other items were the most important to focus on as well as what the examiners were looking for. One MP obtained useful information from a mentor about the content of the exam, such as how to more effectively answer questions, and how and when to sign up for the exam. Having no contacts with mentors or colleagues was perceived to have a negative impact on the exam results. One MP mentioned feeling alone and not having anyone to whom to address questions: "I felt alone […]. Yeah, vulnerable, I had no one, no one to talk to" (MP 4).

Family and friends

Overall, family, Swedish relatives and/or friends were described as being helpful in the exam process as they could facilitate the learning of the Swedish language. However, having small children made it more difficult to prepare and find time for studying for the exam, as well as to have the energy to do so. Also, being on parental leave during the MMI meant having been away from the profession for some time, which often led to forgetting relevant aspects of work: "I had lost quite a lot. I felt like I lost medical terms and how to express myself and some of how to think at a hospital" (MP 6). However, even though having a family and/or children often made it more difficult to focus on the MMI, they also served as one of the major motivators to pass the exam in the first place, as one of the primary career goals of the MPs was to improve the lives of their families.

Time passed since medical school

For many of the MPs, the process of establishing themselves in Sweden after migrating caused a delay in the licensing process. Several MPs took other jobs on arrival due to, for example, the responsibility of supporting a family. Some MPs found it difficult to motivate themselves to get back into their studies, especially those who were older and had already worked for several years as a physician before migrating. One of the MPs expected that he would receive his Swedish medical licence soon after arriving to Sweden. When this did not happen, he spent several years working in other jobs before finally completing the CPP, the MMI and ultimately the final exam. When he took the exam, the MP felt that it was difficult because so much time had passed since his earlier medical education; he also found it exceedingly difficult to find the motivation to study. The MP perceived several subjects as difficult, even after completing the CPP and MMI: 'Answering questions about schizophrenia and psychiatry, and surgery, 8 to 9 years after the education' (MP 4).

Expectations and pressure to perform

Some MPs felt a strong pressure to perform. One said: "It was 11 years of work depending on this thing, so of course you felt, felt nervous" (MP 2). Other reasons for feeling pressure were wanting to be able to proceed in their career with a higher salary and more interesting tasks, and colleagues being aware of them taking the exam. Several of the participants had also read earlier research describing how MPs performed poorer on this specific exam. One had even overheard colleagues refer to the exam statistics in a way that felt discriminatory and hurtful: 'The chief physician said in front of me that, "We get doctors like you that do not succeed on the exam, you know"' (MP 9). For many, this generated additional negative pressure—yet for one MP, such prejudice actually motivated him to study harder and prepare more thoroughly in order to succeed and prove them wrong. There were also examples of MPs who were confident in passing the exam with relative ease, and who therefore did not spend much time studying, only to then fail on the first attempt.

The exam situation and the exam

In this section, the findings related to the exam and to the exam situation are presented, categorised into subthemes.

The exam situation

Most of the MPs felt that they had received sufficient prior information about the format of the exam and the conditions to expect during the exam. One MP however had been unaware that there were no breaks during the exam and had therefore not brought any food or water: "And you are hungry, thirsty and stressed, of course this affects your results, how you answer questions" (MP 6).

The exam design

The design with Modified Essay Question (MEQ) was commonly perceived as adversely influencing the results as this exam format was new to many. The main problem that the MPs perceived with this design was not being able to go back and rework earlier questions. One said: "And then you answer something, and you see the answer on the next side. Reading the answer … and it was not the answer you wrote … my experience was that I became nervous" (MP 12). Some MPs also mentioned that the exam was conducted on a computer, but they felt more comfortable writing with a pen and paper. One believed that Swedish nationally trained physicians were more comfortable than MPs with writing on keyboards. Several MPs claimed that this was the first time they had taken an exam on a computer.

The exam content

In general, MPs perceived that they had the requisite medical knowledge needed to pass the exam. However, some MPs found it easier to answer questions on the exam

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when they had experienced the procedures first-hand during their practical work as physicians in Sweden. This could, however, also be confusing. One MP mentioned being confused during the exam, since he knew how a specific procedure had been described in the course book, but at the same time, the procedure had been performed differently in a hospital, in actual practise: 'So, when you read the book, they say: do like this, give oxygen, give, for example, this medicine […]. But, that is the book, but when you write, in practise it is different" (MP 7). Hence, there was a perceived discrepancy between theory and practise. In many cases, MPs felt that the content of the exam differed from what they had seen or done before. MPs also remarked that the exam sometimes focused too much on rare conditions.

Understanding the language used in the exam

Some MPs mentioned having no problems at work nor experiencing any difficulties when reading Swedish in other settings, but that they did have difficulties understanding the exam questions. For example, the language seemed complicated for some, with one MP stating: "They use a very difficult Swedish, academic Swedish. It is difficult to understand for people who have only studied Swedish as a second language" (MP 7). Even one MP who spoke Swedish as a mother tongue found the language on the exam difficult to understand: "It is like the way they formulate questions. I probably missed credits when misinterpreting questions even though I am Swedish and understand all they write" (MP 3). Problems with understanding the exam language often caused general stress and frustration, as well as the more specific inability to focus on the right parts of questions or missing parts of questions entirely.

Expressing oneself in a foreign language

One aspect related to language that adversely influenced the test results were difficulties expressing oneself. In other words, some MPs believed that they had the medical knowledge needed to respond, but had difficulties finding the right words needed to correctly answer questions: 'When it comes to linguistic confusion, it is not that you do not understand the question, it is how you should answer it' (MP 3). According to one MP, there was a feeling that the linguistic demands were unnecessarily high and reflected preferences from the examiners rather than the demands of the job: '"No, this is not an answer a doctor should write", and then you fail the exam' (MP 7). There was frustration with the lack of sufficient fluency needed to understand and answer the exam questions. Being able to express oneself better in general, but also on the exam, was said to be improved by previous work in the healthcare setting. One's ability to participate in clinical training, as well as one's contacts with colleagues and patients, was also mentioned as being directly related to the relative capacity to express oneself. Many of the MPs felt that clinical experience and contacts with colleagues positively contributed to their exam results.

Translating

Several of the MPs perceived that they had to spend time and energy on translating questions between Swedish and their other language. This meant that they had less time and energy for answering questions on the exam. For at least one of the MPs, this caused stress and a feeling of having not answered some of the questions well and having left others unfinished, all due to time constraints.

DISCUSSION

We found that exam results (both in terms of total scores and failure rates) for physicians educated outside the EU were very strongly associated with age and that there was an interaction with CPP participation. CPP participation was found to be associated with poorer exam results for most individuals, except maybe for the youngest and oldest individuals where it may be beneficial. However, we do not know if the test results would have been poorer if MPs had not participated in the CPP at all.

MPs being 45 or older had approximately 16% lower total test score than younger peers and a failure rate around 80%. Our results are in line with previous research which have shown a notable association between age and lower success rate for physicians trained abroad.[6] [cf.[8]] We found that participation in the CPP may counteract some of this age effect. We found no association between geographical region, gender or pass rate in the same group nor for the two subgroups. Other research have identified country of medical education as an important predictor for success rate.[6] Our study lacked the sample size for comparing individual countries. Regarding gender differences, results may vary based on research data, for example, a quantitative study observed no gender differences,[20] but this was on the contrary identified as an influential aspect in a qualitative study.[4]

In our qualitative data, we also identified other aspects influencing the exam results of MPs during the recertification process, categorising the interview findings into two major themes: *preparations and biographical aspects* and *the exam and exam situation*. Common knowledge about the lower pass rate of MPs can lead to a social mechanism akin to a self-fulfilling prophecy.[21] Further, common knowledge of lower pass rates can be stigmatising [cf.[22]] and can influence how one is treated, how one prepares and the degree to which one is determined to succeed or place extra pressure on others. Few participants felt that their medical knowledge was insufficient, and those who did relate this to specific questions and knowledge.

Language difficulties were perceived as the main adverse influence on exam results, a finding in line with previous research[4 10 23] together with unfamiliarity with the exam design.[2 5] As MPs have conducted their medical education in other countries, they have been less socialised into the exam language and exam design of MEQ and therefore need to make additional efforts in this regard. For this, different strategies and tools were used which, at the same time, can be seen as mediators in the

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socialisation process. Regarding language difficulties, MPs did not always fully understand the questions or the complicated and academic language used, nor how they were supposed to best express themselves. It might also be more difficult to learn a new language when one is older. First language have been identified as influencing exam results or/and being a predictor of success.[6] It is interesting however that Swedish citizens who are likely to have Swedish as their mother tongue but who undergo the medical education in Poland, also have a considerable lower success rate than physicians educated in Sweden on the same licensing exam described in this study.(unpublished, Olsson, Östergren, Carlborg, AT-provet. Läkartidningen 2020) A similar pattern have been identified among Canadians who participate in a medical education abroad.[6] The language used in the exams might be different to the language used as a student. Thus, this might mean that it is specifically the language used in the exam that is problematic, and not the language used when working. Several of our interviewees also felt that they had trouble with the language only on the exam, not in their practical work life. To be allowed to take the exam, MPs must have first completed practical examinations, for which they hold patient consultations under supervision. This raises the question of whether this type of exam is the best design for all MPs. A more concise, less text-heavy Multiple Choice Questions (MCQ) might be easier to process for MPs, relieving some of the language-related stress discussed above.[24] More experience of tests might also influence the results positively: MPs who have not participated in the CPP have passed a proficiency test in the beginning of the licensing process. Many try for the proficiency test before applying to the CPP as it is believed to be a shorter route to the Swedish medical license to practice. Lower exam results can also be influenced by discrepancy between medical educations in different countries. For example, regarding medical knowledge, how much practice that was included and which patients and conditions that were encountered. Our results show that these reasons also might be applied on the MMI and what MPs have been exposed to during this. Studies have shown that if MPs have not experienced the content of questions in practise, it will be more difficult to answer,[4] this also regards clinical assessments.[25]

Most of the participants in this study felt stressed during the exam, and several felt that this had affected their results. Stress is likely felt similarly by both MPs and nationally trained physicians; however, the MPs might feel increased pressure due to language, age and family situations, as discussed above.

An overarching influential aspect deduced from the different subthemes was time. Time had passed since the original medical education of most of the MPs. This was shown to make the exam even more difficult,[cf.[4]] which several of the MPs mentioned. We also found that the longer time had passed since graduation increased the risk of failing univariately. However, there was a strong association between the variables of years after graduation and age and this association disappeared when age was included in the model. MPs were in general also older than their nationally educated peers when they took the exam. Some had families and financial responsibilities that might be greater than those experienced by their nationally educated peers.[cf.[6]] This is in line with our results, as we found that it was difficult for some MPs to find the time to study, as they had responsibilities to their family and children. Time was also needed during the exam situation, that is, for translating and understanding questions and for formulating answers.

CONCLUSION

Age seems to be an important predictor for failing in the first attempt. However, for MPs 45 years or older, the CPP may partly be able to counteract this age effect. Interviewed MPs had responsibilities during the preparation time that made it somewhat difficult to study for the exam. Strategies and tools used to prepare also became mediators in the socialisation of the MPs into the exam context. During the exam situation, the MPs spent extra time and energy on language-related aspects.

Limitations

Our interviewees were recruited via emails sent to MPs who had participated in the CPP. They were diverse with respect to age, gender, reason for migration, country of origin and medical degree, and performance on the exam; however, volunteer bias may have been present, as certain types of people are more likely to participate in studies than others, potentially creating a misrepresentation of the whole group experience.[26] Another limitation of our study was that 60% of the interview participants passed the exam on their first attempt, which might limit the data needed to identify barriers; however, this success rate is congruent with the overall success rate on the exam. The data set included all test data for the period 2013 to 2019, some individuals might have attempted and failed on the exam prior to this period before succeeding, resulting in them being falsely reported as succeeded on the first attempted. We chose to use geographical world regions. This separation was probably on an irrelevant level, but any association on country level could not be investigated due to too few individuals from each country.

Further research

To better understand the reasons why the pass rate on the exam is lower for MPs, future studies may include linguistic and content analysis of MPs answers on the exam, compared with answers by physicians educated in Sweden. Such an analysis could reveal if there are certain aspects of the test where MPs to a larger extent fail to provide the correct answer. Furthermore, aspects of test bias should be explored further. While prolonged stress certainly has negative effects on the body,[27] the effects that examination-related stress have on exam results are less clear and is an interesting area of further work.[28] The

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reasons why CPP participants in a certain age have a lower pass rate on the exam than other MPs should be further explored. When more MPs have completed the exam, it might be possible to investigate any association on country level to further discuss any differences in medical educations, and cultural aspects related to the profession. [cf.[4]]

Implications for practise

We suggest that extra learning opportunities focused specifically on the exam design, written language and test expectations could be helpful, as part of the CPP programme, for improving MP test results. To organise study groups or a peer mentoring programme that includes nationally trained physicians would probably also be beneficial. [cf.[8 25]]

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ORCID iD
Linda Sturesson http://orcid.org/0000-0001-9683-3485

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