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Influence of social networks in healthcare on preparation for selection procedures of health professions education: a Dutch interview study

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ABSTRACT

Objectives Health professions education (HPE) students are often not representative of the populations they will serve. The underrepresentation of non-traditional students is problematic because diversity is essential for promoting excellence in health education and care. This study aimed to understand the perceptions of traditional and non-traditional students regarding facilitators and barriers in preparing for HPE selection procedures, and to determine the role of social networks in their decision-making and preparations to apply.

Methods A qualitative study was conducted with 26 Dutch youth who were interested in university-level HPE programmes. Semistructured interviews and sociograms were analysed using thematic analysis, adopting a constructivist approach.

Results Twenty-six high school students participated, with traditional and non-traditional backgrounds, with and without social networks in healthcare and higher education. Two themes were constructed. First, four high-impact facilitators helped to overcome barriers to apply and in preparation for selection: access to a social network connection working or studying in healthcare, to correct information, to healthcare experience and to a social network connection in higher education. Lack of information was the main barrier while access to social network connections in healthcare was the main facilitator to overcome this barrier. However, this access was unevenly distributed. Second, access alone is not enough: the need for agency to make use of available facilitators is also essential.

Conclusions The themes are discussed using intersectionality. Traditional students with access to facilitators develop their self-efficacy and agency within social structures that privilege them, whereas non-traditional students must develop those skills without such structures. Our findings provide recommendations for the ways in which universities can remove barriers that cause unequal opportunities to prepare for the selection of HPE programmes. Along with equitable admissions, these recommendations can help to achieve a more representative student population and subsequently a better quality of health education and care.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ A strength of this study is the focus on *how* the social networks of students influence their decision-making process, and *how* exactly these networks provide access to facilitators and result in unequal opportunities, both in practical terms and in developing the self-efficacy and agency that is needed to successfully prepare for the competitive selection procedures of health professions education programmes.
⇒ The non-random sample had an underrepresentation of participants from rural areas, with an estimated low socioeconomic status, or with parents on social welfare.
⇒ The traditional students in our sample were more likely to have parents who worked in the healthcare sector, which may have influenced our results.
⇒ The interviewer belongs to the Dutch ethnic majority group, making it possible that some ethnic minority students refrained from expressing points of view relating to discrimination.

BACKGROUND

In many countries, the cohorts trained to become health professionals are unrepresentative of the populations they serve. Health professions education (HPE) students disproportionately have highly educated and high-income parents who are more likely to work in the medical field, and often belong to the ethnic majority.[1–4] The underrepresentation of non-traditional students is problematic because diversity is essential in promoting excellence in health education and care.[5–7] Here, we define non-traditional students as students whose parents did not complete higher education and/or who have a migration background and belong to an ethnic minority group; and traditional students as students with at least one parent who

completed higher education, and who have no migration background or are not an ethnic minority.[8]

There is sufficient reason to assume that underrepresentation of non-traditional students is a global phenomenon, as evidence suggests that opportunities to enrol in HPE programmes are not equally available to all eligible students[9 10]: those with non-traditional backgrounds face barriers in selection procedures, and there are indications that they tend to shy away from applying to HPE programmes.[11–14] The latter is called self-selection. Self-selection refers to students deciding to apply or not based on the information they have[15] and how they estimate their chance of success based on actual and perceived barriers and facilitators. Known barriers include lack of knowledge about the necessary preparations to increase chances of admission,[16 17] or limited access to suitable extracurricular activities.[18] Other barriers can be concerns about one's ability to get admitted,[19] for example, due to perceptions of lower chances of being selected compared with other students,[20 21] fear of not fitting in because of one's background[22] or discouragement by teachers.[23] These barriers can relate to socioeconomic status (SES)[24 25] and its associated social capital (real or potential resources accessible through a person's networks) and cultural capital (here, the domestic transfer of values relating to education and academic achievement).[26] These factors may partially explain the underrepresentation of certain groups of non-traditional students in applicant pools.[1]

There are also indications that the networks of traditional and non-traditional students play an important role in their decision to apply. For example, Southgate *et al*[18] found that all students, but especially non-traditional students, expressed a desire for 'hot knowledge' straight from the source, to motivate their study choice and preparations for admission. Not knowing doctors who served as a hot knowledge source was therefore an important barrier. The lack of a network in the healthcare field was also found to be a major barrier.[20 27 28] Without such a network, students experienced more difficulties in acquiring relevant work experience, preparing for the medical school application and developing the confidence that the HPE programme is the right study choice. These students can also become demotivated by the inequality they perceive.[14] However, the exact mechanisms behind *how* access to these social networks in healthcare can facilitate potential applicants are not clear. Other studies employing qualitative social network analyses in HPE have shown the importance of social networks of medical students in how they transition from preclinical to clinical training, and their networks' role in accessing opportunities to learn[29]; the influence of social networks on academic performance in medical school,[30] and how (not) having family members working in the medical field results in medical students being either 'insiders' versus 'social newcomers' to medicine.[31] This study aimed to explore how social networks can influence high school students in the preapplication stages of HPE.

In many countries there is broad attention to potential inequality of opportunity in access to higher education in general, and HPE programmes in particular. In the Netherlands, there are also strong indications that HPE students are unrepresentative for the population as a whole, and concerns exist that the change from lottery admission to selection has negatively influenced student diversity and equal opportunities in admissions.[21] For example, a retrospective cohort study showed that male applicants, applicants with a Turkish, Moroccan, Surinamese or Dutch Caribbean migration background, applicants without parents whose wealth belongs to the top-10% of the population, and applicants without healthcare professional parents, have significantly lower odds of being selected.[32]In spite of men making up 50% of the student population that is eligible to apply for HPE, they make up only about 30% of the HPE applicant pool and admitted student population.[32] However, international research on the detailed demographics of potentially eligible student and applicant pools of HPE programmes, and how exactly the factors which influence self-selection play a role, is scarce.[21] Wouters *et al*[15] provided an account of factors that influence Dutch potential applicants' motivation to apply for medicine. However, it is not sufficiently known to what extent this process differs between traditional and non-traditional students, nor how people in their networks influence their decision-making. These potential differences may play an important role in understanding the underrepresentation of certain sociodemographic groups in HPE programmes. This knowledge is crucial for universities to develop outreach programmes or take away possible barriers, to increase the diversity of the HPE applicant pool. Therefore, this article aimed to answer the following research questions: (1) What are the perceptions of high school students of different backgrounds regarding facilitators and barriers in getting ready for selection and gaining admission to an HPE programme? and (2) How do people in the social networks of these students influence their decision-making to apply and their preparations for the selection procedure? Our objective is to explore, rather than compare, what their perceptions and social networks are, and how these interact.

METHOD

Design, procedure and setting

We designed a cross-sectional study, adopting a constructivist approach,[33] and conducted semistructured qualitative interviews with a diverse group of traditional and non-traditional high school students aged 16 years and older, to gain insight into various facilitators and barriers. One-on-one interviews enabled an in-depth exploration of how participants experience and make sense of their own unique world.[33] Before the start of the official interviews, we organised practice interviews with medical students. Their feedback yielded interview questions that were more sensitive to the lived experiences of potential

participants. For example, rather than asking them about their mother and father (which we did in the practice interviews), we changed our wording to the more inclusive phrase 'parent/caretaker'.

Both purposive sampling and snowball sampling[34] were used to recruit participants who were eligible for university-level HPE programmes on the basis of their preuniversity high school track. We focused on students who were interested in studying medicine, clinical technology, pharmacy, dentistry and biomedical sciences, to capture a wider range of potential HPE applicants who were in the process of getting ready for one or more HPE selection procedure(s) which have similar eligibility requirements. In the Netherlands, all HPE programmes design their own selection procedure and make use of a limited arsenal of selection instruments, such as previous academic achievement, work samples, admission examinations or assessment of extracurricular activities.[35]

Letters and recruitment posters were sent by email and regular mail to 76 schools in six provinces of the Netherlands because we were interested in a diversity of backgrounds and experiences (purposive sampling). Participants were also asked if they knew other potential participants (snowball sampling). They were interviewed by LM at or near their own high school, so they would feel at ease in a familiar environment. The interviewer had no relationship to the participants and was not involved in any selection procedure. We decided that data collection would be concluded once data sufficiency was achieved, meaning once two subsequent interviews did not yield new insights into the research topics.[36] Interviews lasted for 30–96 min.

At the start of the interview, participants filled out a form asking about their gender, parents' occupations, and ethnic background (all free text) and highest parental education levels (multiple choice). Parental education levels and occupations were used to determine first-generation student status and whether participants had a parental social network in healthcare.

The first part of the interview focused on the opinions about and expectations of the selection procedures, their personal preparation and their current and potential facilitators and barriers (see online supplemental appendix 1 for topic list). The second part consisted of the student drawing two networks by hand: one of the people who play a role in making their study choice, the other of the people in their network who can help them prepare for the selection procedure. Each individual person in their network is referred to as an *alter*.[29] Participants were instructed to start with themselves as the focal point, drawing lines between them and their alters. The participants thereby created what is called a participant-generated 'ego network sociogram'.[37] The connections between individuals in the sociograms are called *ties*.[29] While drawing, participants were asked how these people played a role in both processes, and in what way they related to these persons. As we aimed to focus on the meaning of the relationships between the student and their network connections, rather than statistically measure them, we chose the approach of qualitative social network analysis.[37] The sociograms were used during the interview for stimulated recall, and participants were able to edit and refine their sociograms while the interviewer continued to probe them. We placed no limits on the number of ties that students could draw. During data analysis, the sociograms enabled the research team to gain insight into the different (types of) networks of participants, and which type of ties (eg, connected through family, school, friendship, work, religious organisation, etc) played facilitating roles in the process of choosing an HPE programme and preparing for selection. By analysing transcripts next to the two sociograms of the respondent, we aimed to reveal insights into hidden relational data which would not be found on the basis of either method alone.[37] For example, we studied whether participants named alters in the transcript, which were associated with a facilitator or barrier, or who played a role in getting access to a facilitator. Then, we looked at whether they had named this alter in one of their sociograms, and if so, in which context. We also studied whether these alters were closely connected (eg, parents, siblings) or were more distant to the respondent (eg, their dentist or doctor).

We focused on each student's own social networks, since we assumed that (a) people in one's network may be inclined to help a high school student make study choices and prepare for a selection procedure (like parents who help their children, and older siblings who help their younger siblings), and (b) since these people are easily accessible to young high school students, they would be the easiest go-to persons for students requiring help and resources.

Ethical considerations

Participation was voluntary and the participants were informed that they could withdraw from the study at any point in time. Participants gave written informed consent. In the Netherlands, 16 year-olds do not need parental consent to participate in research. Interviews were audio recorded and transcribed. Data were pseudonymised and only LM had access to traceable data. Participants were given a €10 gift card each.

Research team

The team consisted of researchers with various professional backgrounds (in sociology, psychology, educational science, pharmacy and medicine), who share a mutual interest in the subject of equitable opportunities in HPE. LM, AW, ASK, JHR and GC were first-generation students. SF-W was a traditional student. RAK has an ethnic minority background. RAK, who had a limited social network in HPE at the start of medical school, contributed her understanding of the lived experiences of students with limited networks. The diversity of our backgrounds encouraged reflexivity[38] and critical dialogue, ensured we interpreted the data using different theoretical and conceptual lenses and resulted in proactively looking for

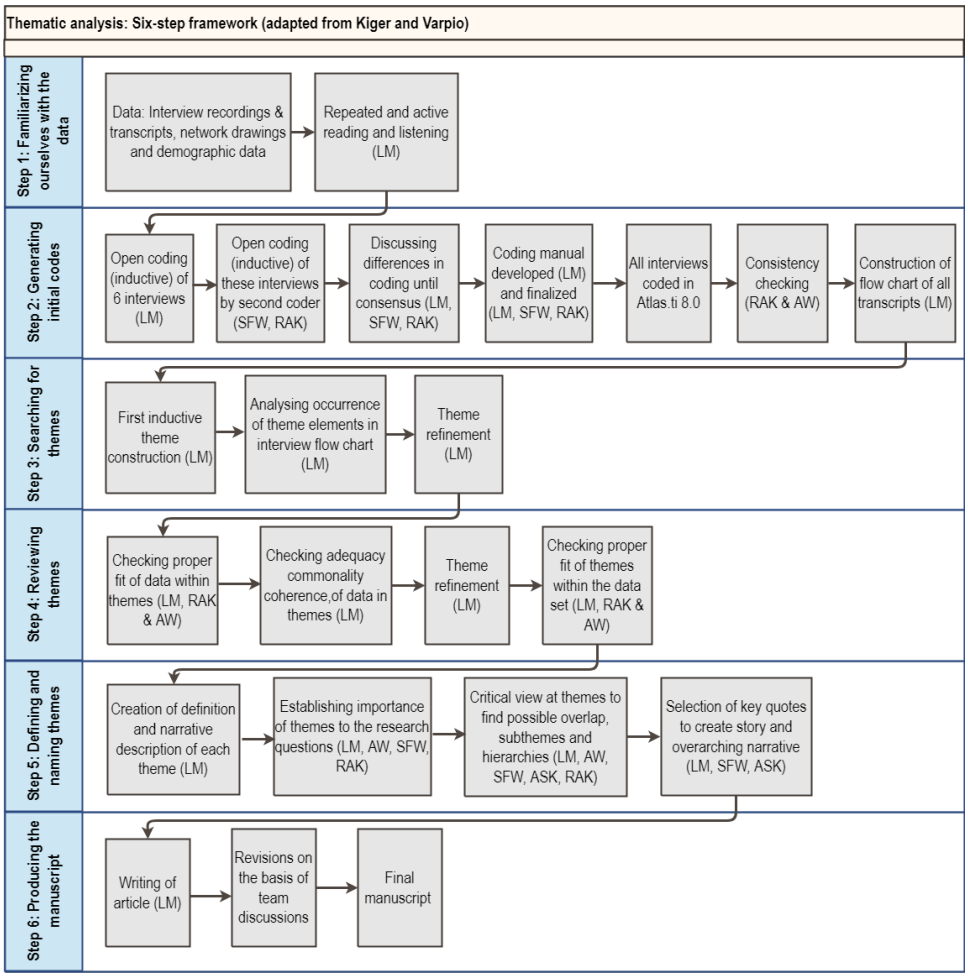

Figure 1 Six-step framework (adapted from Kiger and Varpio [40]).

potential blind spots. For example, we had a discussion about the potential role of the interviewer's identity (LM) in interviewing participants with a (visibly or invisibly) different background. This discussion led us to organise practice interviews with medical students, as mentioned in the previous section.

Patient and public involvement

Patients or the public were not involved in the design, or conduct, or reporting, or dissemination plans of our research.

Data analysis

We used a social constructivist paradigm for our data analysis, assuming that there are multiple realities, as each student holds a unique world perspective. This perspective is subjective and based on their individual social location and the social conditions under which their knowledge was formed.[39] Therefore, we did not start with a specific theory to interpret our results, nor sensitising concepts, but inductively interpreted the meanings of participants' responses[34] to construct our themes using thematic analysis. We selected this method as it is a useful tool to seek understanding of the experiences, thoughts and behaviours of our participants.[40] Figure 1 shows the steps taken in the data analysis process by the different members of the research team, based on the six-step framework described by Kiger and Varpio.[40]

Additionally, a flow chart portraying participants' core utterances was made to enable a deeper understanding of *how* access to (perceived) facilitators helped them to overcome their (perceived) barriers in the process of developing their motivation to study in an HPE programme, and in preparing for the selection procedure. We made this flow chart in order to discover potential patterns occurring throughout the different interview transcripts, and to visualise the connections between facilitators and barriers, with the aim to formulate a more complete answer to research question 2. After completion, the flowchart was condensed to enable easier interpretation (Figure 2).

RESULTS

Participants

We interviewed 26 high school students from 14 schools in five cities and one small town, between June 2019 and March 2020. They were enrolled in the fourth or fifth (penultimate) year of the science-oriented preuniversity

Table 1 Participants' background characteristics

Migration background	
No migration background	12
Migration background and ethnic minority	11
Migration background and not an ethnic minority	3
First-generation status	
No parent completed higher education	11
At least 1 parent completed higher education	15
Parents' jobs	
No parent working in medical field	14
At least 1 parent working in medical field, as caregiver	7
1 parent working in medical field, not as caregiver	4
2 parents working in medical field (1 as caregiver, 1 not as caregiver)	1
Co-occurrence of traditional student status and parental network in healthcare	
Traditional student* and parental network in healthcare	8
Traditional student* and no parental network in healthcare	4
Non-traditional student† and parental network in healthcare	4
Non-traditional student† and no parental network in healthcare	10
Preferred HPE programme (can be more than one)	
Medicine	24
Biomedical sciences	4
Medical sciences	2
Clinical technology	2
Dentistry	1
Pharmacy	1
Pharmaceutical sciences	1

*Traditional student: at least one parent completed higher education+no migration background/no ethnic minority.
†Non-traditional student: both parents did not complete higher education and/or with migration background and ethnic minority.
HPE, health professions education.

tracks, which give access to HPE programmes. The demographic composition of the sample is summarised in table 1. Participants with a migration background belong to the first or second generation. We did not observe differences on the basis of preferred HPE programmes.

There were numerous factors that participants experienced as facilitating or presenting a barrier to pursuing and entering an HPE programme (table 2). These factors had an influence on their motivation to pursue an HPE programme. We developed two main themes based on the interviews, sociograms and the flow chart (figure 2). These themes relate to (1) students' unequal access to high-impact facilitators, and (2) students' mindset and responsibility to use available facilitators, to actively create opportunities for oneself and to overcome barriers. As the perceived facilitators and barriers were very intertwined with participants' networks, the themes relate to both research questions simultaneously.

Theme 1: access to high-impact facilitators is perceived as very beneficial for preparation, but this access is distributed unequally

The high school students in our sample were interested in different HPE programmes at different universities and thus had different selection procedures to prepare for. In the process of getting ready for these respective procedures, participants perceived a great number of facilitators (table 2). We found that four of those had a high impact because they were perceived as helpful in preparing to apply or in having a higher chance of being admitted, and because they provided access to other facilitators. The first and most important one was *access to a social network connection working or studying in the medical field*, such as parents, siblings, other family members or (family of) friends. These types of ties were the most common connections, but alters could also be participants' doctors, dentists, employers, teachers or deans. These people were role models, aided in making a study choice and/or were expected to assist in preparing for the selection procedure. For example, participant 7 (interested in medicine, man, one parent completed higher education, both parents in healthcare, no migration background) explained:

> I try broadening my knowledge in the area of anatomy, which is going quite well since my sister is studying for her Nursing degree. So she has to know all sorts of things about anatomy. And my mom is also doing different things for her Personal Care Assistant degree, so I also learn from that. So that gives me an advantage compared to other people.

Network connections in the medical field also helped participants to get *access to correct and valuable information related to HPE and healthcare*, which was a second important facilitator. This included information about selection, first-hand knowledge of the healthcare sector, inspiring or informative stories, or access to medical literature. It improved participants' motivation, and strengthened their conviction that the HPE programme was the right study choice. It assisted in choosing a strategic approach to the selection procedure, as they knew what the selection requirements were. Participant 16 (interested in medicine and biomedical sciences, woman, higher educated parents, no parents in healthcare, migration background, not an ethnic minority) got in contact with a physician working in an elderly care home through a friend's father (also a physician):

> He helped me because I asked him very much, not about selection but about the study itself (…) And also, yeah just about what the study contains,

Table 2 Factors students experienced as facilitating or presenting a barrier to pursuing an HPE programme

Facilitators	Barriers
Having a social network connection in the medical field	Doubts about study choice (eg, due to length or difficulty of study, negative stories, feelings of inaptitude)
Having role models in the medical field	Lack of information (eg, about the content or difficulty of the HPE programme, the selection procedure, university life and other issues)
Having healthcare experience	High demands of selection
Interest in the human body, diseases and cures	Economic barriers such as the fear of study debts and postponing the moment one can begin to earn an income
Having access to (correct) information	Parental pressure
Seeing selection as a motivating challenge to be overcome	Lacking a social network at university or in an HPE programme
The desire to help people	Sociocultural barriers
The desire to advance medical care	Being a first-generation student
The desire to save lives	Lack of practical (parental) support
Enjoying and being good at high school courses related to desired HPE programme	Becoming demotivated by the selection procedure or low acceptance percentage
Enjoying studying and the expectation of life-long learning in HPE	Feelings of stress, insecurity, nervousness or fear of failure
Access to medical books in the home	A general lack of motivation
Having ambitions to specialise in a particular health professions field	Lack of time to attend Student-for-a-Day/Open Days
Being a patient	Meeting people who did not get selected, or who regret HPE study choice
Medical master classes at university	
Being family of a (deceased) patient	
Participation in extracurricular programmes relating to HPE programmes	
Medical TV series	

HPE, health professions education; TV, television.

content-wise. And that also helped me to get even more enthusiastic about the study program. So that strengthened it, so to say.

Lacking access to a social network in the medical field often resulted in the barrier of lacking correct or useful information. Lack of information led some participants to have doubts about their study choice or expected chance of successful admission, sometimes resulting in feelings of being insufficiently prepared. Although certain information can also be gained through other avenues than a social network in healthcare, such as by attending Open Days, participants emphasised that such avenues mainly provide general information, not the 'insider' information they were looking for.

The third important facilitator was *healthcare experience*, for example, through volunteering, shadowing a doctor, an internship or a paid job. A social network in healthcare made it easier to gain such experience, but some participants found ways without a network. Participants described how healthcare experience strengthened their motivation, and supported overcoming psychological barriers, such as study choice doubts, fear of failure, pressure or stress regarding competition with others. It also provided them with access to other facilitators: they got a chance to build their curriculum vitae (CV) (which helped build their confidence in successful admission); they had access to more information about the medical field, the selection procedure, the content of the HPE programme and future career options; and they gained valuable network connections. Furthermore, it led to inspiring patient encounters, which enhanced motivation. This made healthcare experience more valuable than simply a CV-building activity to increase their chances of admission. For example, participant 17 (interested in medicine or medical sciences, woman, no parent completed higher education, one parent in healthcare as care advisor, migration background, ethnic minority) explained:

By shadowing doctors I already learn quite a lot. Because every time you walk there, then you hear so many terms that you really don't understand, and especially in the beginning I really didn't understand anything. And every time you hear something, you can look it all up, or ask, they just like it if you ask

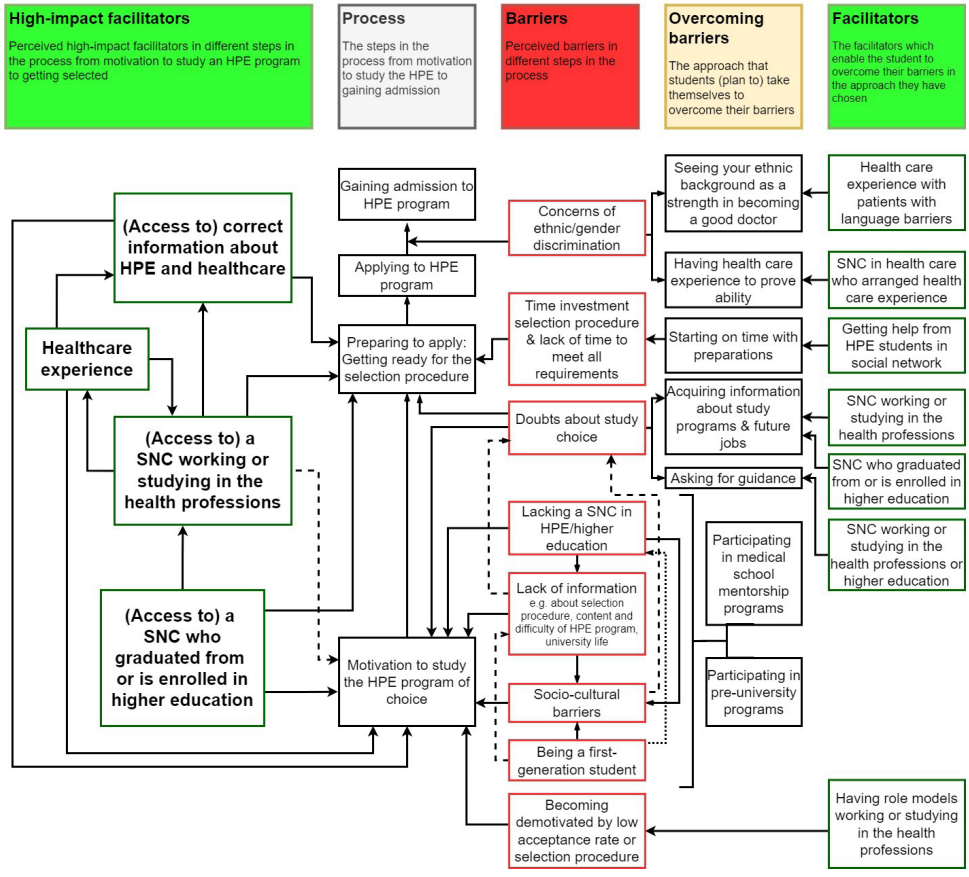

Figure 2 This flow chart maps the core utterances of all transcripts, analysing the links between these utterances as expressed by the participants, and categorising them as 'facilitators', 'barriers' or 'approaches to overcome barriers' which are at play, and interact, in different phases of the process to get ready for selection. Arrows have different patterns for readability but have the same meaning. HPE, health professions education; SNC, social network connection.

> questions. So I find that a nice way to learn too. I have also seen how you need to suture, that was very cool (…) I shadowed a surgeon and was allowed to see the wound, and he said: 'do you see that hamstring there?' and I said: 'which one?' and he said 'well, put on a glove and come here'. (…) I really liked it, yes, because I was allowed to feel it and that was so cool.

For more details on the facilitating effects of having a social network connection in the healthcare sector, see table 3 and figure 2.

The fourth important facilitator was *having family members or other social network connections who graduated from or are currently enrolled in higher education*. Several participants described how parents or siblings could help them in their decision-making process to pursue a university-level HPE programme, and how they were able to assist them better thanks to their knowledge of navigating the university system or the HPE selection procedure. For example, participant 23 (interested in pharmacy or pharmaceutical sciences, woman, higher educated parents, no parents in healthcare, migration background, ethnic minority) explained how she acquired information about study programmes:

> I mainly read a lot about the universities, about the study programmes. And really read in detail about what they expect, what they want from you. But sometimes it was a bit too much information and then I didn't understand everything they meant, so then I go after that some more (…) And I know a lot of acquaintances, who all studied [at university] as well. So usually, when I know that someone studied something in particular, then I ask: okay, and what do you think of it?

Participants, who did not have family members with this experience, sometimes searched for this type of assistance in others. Lacking access to this facilitator was described explicitly by a few participants as a barrier. For example, participant 4 (interested in medicine, woman, no parent completed higher education, one parent in healthcare (care assistant), no migration background) described:

> Maybe other future medicine students have parents who also have their education level or completed the same study, and I don't have that. Also not in the wider family (…). For example, their parents could say like this is how a selection procedure would go, because maybe they already did it, or another one, that

Table 3 Quotes of theme 1 on the facilitating effects of a social network in healthcare

Quotes	Participants' background characteristics and preferred HPE programme
Access to correct and valuable information	
Traditional students	
I: 'So you said, there were two students here during biology class (…)?' 22: 'Yes, because for me that helped quite a lot because they spoke in detail about that selection procedure, so that helps.' I: 'And in what way does it help you if you hear it from students who did it themselves (…) compared to a website or an Open Day?' 22: 'Well, at an Open Day I mainly find it [the information] very general. If you talk to a student, they can tell you more in detail like "I did this and this could maybe help you". Because I think that at an Open Day they give good information, but it's very general, so it is kind of useful but not really in detail. And because of that you still have to keep searching for information.'	Participant 22 (medicine or biomedical sciences): woman, higher educated parents, one parent in healthcare (financial advisor), no migration background
Non-traditional students	
8: 'With my parents, I talk quite a lot about it. Last year for example I really had no idea where I wanted to go, only a little bit of an idea. And yeah, my brother is studying Nursing, so I heard quite a lot of these stories about doing an internship in a care home for example. Because he also had to work in a care home where there are people who only have three months to live (…) and you need all sorts of skills for that, and so on. That seems interesting to me.'	Participant 8 (medicine): woman, no parent completed higher education, one parent in healthcare (secretary), no migration background
20: 'I try to do internships, and joining with lots of programs like these [Buddy program at medical school], so that I also really know like "Okay, Medicine is really something for me". And because of that I also have more insight so to say, and based on that I can do internships for example, or other things that could contribute to the selection procedure. (…) The Buddies Breaking Barriers project [Buddy program at medical school], because of that I can just get more insight or shadow a student so that I also really know how things go, and not just see Medicine from the outside, so to say (…) And the students there have explained a lot about the selection procedure and if you have questions for them, you can simply ask them. And they can help you with that too, so I think they can also have an influence on your selection procedure.'	Participant 20 (medicine): man, no parent completed higher education, no parents in healthcare, migration background, ethnic minority
Access to healthcare experience	
Traditional students	
7: 'Well, I think almost nobody is active for almost 2 years in the healthcare sector (…) Other people don't have those contacts in the end to be able to work there (…) I actually rolled into it through my mom, I once joined as a volunteer in one of those care groups. And half a year later I officially became a volunteer.' [After a year of volunteering, this participant gained a paid position at this elderly care home.]	Participant 7 (medicine): man, one parent completed higher education, both parents in healthcare (one as care assistant+one in policy role), no migration background
13: 'Our GP is friends with my mother, so I can do an internship there for a while and help out. And I do that one hour per week. And I hope by the time I'm in the 6th [final high school year], those have been enough hours. And through that I also know if I find it interesting to study medicine.'	Participant 13 (medicine): woman, higher educated parents, no parents in healthcare, mother has migration background, not an ethnic minority
Non-traditional students	
14: 'I would really like to become a haematologist (…) Because I myself have been in the hospital for a long time because I suffer from a blood disease, and because I was at the Haematology department a lot, I could also hear often from the haematologists how that goes (…) Because I myself see blood very often (…) it's very interesting for me to cure that in other people (…) My personal doctors also say that they would really like it if I would also become a doctor. But they also tell that it's pretty difficult, but they also want me to shadow them so I can really prepare a bit for it.'	Participant 14 (medicine): woman, no parent completed higher education, no parent in healthcare, migration background, ethnic minority

GP, general practitioner; HPE, health professions education.

maybe they could give advice on how that goes and how you should do that. But I have to do that myself.

In summary, access to a social network connection working or studying in the medical field, and a social network connection in higher education were important in gaining access to a range of other facilitators, such as access to correct information and healthcare experience. Access to valuable social network connections could be relatively easy and less hierarchical in nature, such as parents, siblings, other family members or (family of) friends. These types of ties were the most common connections, showing that network alters were often having a certain degree of similarity to the participants. However, some alters were less similar and had a more hierarchical relationship to the participant, such as participants' personal doctors, employers, teachers or deans.

Our findings indicated that access to facilitators is distributed unequally. For example, participation in preparatory and mentoring programmes that are offered by universities helped some participants to overcome the barriers of a lack of information or a social network. However, preuniversity programmes were not accessible to all interested participants due to limited availability of places, a high grade point average (GPA) requirement and/or high costs. This was perceived as a barrier by several participants.

Some participants explicitly described the lack of access to a certain facilitator (eg, higher educated parents, a social network in healthcare) as a barrier. However, for most it remained implicit: when they described the barriers they perceived (eg, not knowing enough about possible career options after graduating from an HPE programme), they did not explicitly say that these barriers were caused by a lack of access to, for example, healthcare experience. On the other hand, participants with more resources, facilitators and useful social network connections at their disposal recognised their advantages over their peers who lacked them and judged this as unequal or unfair. This perceived inequality or unfairness was a recurring theme, and it related to different elements of the preparation process: GPA, CV building, preuniversity programmes, paid entrance examination trainings, parental backgrounds and access to university or an HPE study in general. For example, participant 16 (preferred HPE programme: medicine or biomedical sciences, woman, higher educated parents, no parent in healthcare, migration background, not an ethnic minority) argued:

> I know entire programs exist that really cost 300 Euros, that help you with your admission. But I don't know, I feel that's a bit unfair. Because suppose you don't have a lot of money, then you cannot join that. That because of that, people with more money get in more easily. So I don't feel like joining that (…) I would be able to pay, and my parents could also pay for it. But it's more out of principle that that I don't want to participate in that.

Participant 1 (preferred HPE programme: medicine, woman, higher educated parents, one parent in healthcare (as caregiver), no migration background) told the story of a classmate with highly educated refugee parents, who were doctors in their home country but were not allowed to practise medicine in the Netherlands. She argued that, if they would have been able to be practising physicians here, their daughter would have more contacts in the medical field. When asked what difference this could have made, she answered:

> I don't know if that directly influences whether their daughter gets admitted to the study program or not, but I think that unconsciously it does matter somehow. Because if her parents are part of that network, they would rather see their child getting admitted. Then they would do more to achieve that, or there would be other people who give them advice which their daughter could use. Or yeah, if you are in that world, then it is just easier to stay in there (…) It always goes a bit more naturally if you are already in that world. Maybe it would also help for your motivation.

This shows that the participants who had certain privileges (eg, higher educated parents, parents in healthcare, no refugee background) were acutely aware of the fact that some of their peers may face barriers in getting ready for the selection procedure, for reasons that did not relate to their own effort or merit.

These and other quotes (table 4) show that students cannot prepare for selection on the basis of a level playing field, and cannot overcome their barriers as easily.

Theme 2: access alone is not enough—the need for agency to make use of available facilitators, to create opportunities and to overcome barriers

Once participants decided to pursue an HPE programme, they entered the phase of preparing to apply. Many participants stressed the importance of taking one's own responsibility and having the right mindset or attitude in this regard to adequately prepare oneself. For example, participant 1 argued:

> I think that if I put my mind to medicine, then I have a large chance of success. I do have… yes, it's very stupid to say, but I'm just not the dumbest. I have also done an IQ test in the past, and I know that in principle I should be able to do it, so I think that it's really up to yourself. Do I want it, do I go for it, do I do my best for this, do I take every opportunity I can take, and I also want to be able to look back later and think: 'Yes, even if I had wanted to do more, I couldn't even have done it'. (…) But I do think it will be difficult, so to say, it's not like you just get in easily, so I definitely would have to do my best.

Table 5 shows more quotes related to this theme.

Although participants perceived numerous barriers, many had already developed approaches to overcome these. For example, several participants with a migration

Table 4 Quotes on unequal opportunities to prepare for selection

Quotes	Participants' background characteristics and preferred HPE programme
Unequal opportunities related to parental education or profession	
Traditional students	
6: 'My parents both studied medicine, so they know a lot about it, and they are just university-educated so I think they can help me with it. And other students maybe don't have that, or they don't have a quiet home environment, and so that could also be a barrier.'	Participant 6 (medicine or biomedical sciences): woman, higher educated parents, both parents in healthcare (physicians), no migration background
12: 'Maybe if your parents move here at a later age and you speak Dutch well and have that skill and your parents don't, and you need help for certain school courses, then you can't ask your parents for that. And I do have an advantage there.'	Participant 12 (medicine, biomedical sciences or clinical technology): woman, higher educated parents, no parent in healthcare, migration background, not an ethnic minority
Non-traditional students	
17: 'If you look at the different cultures / ethnic backgrounds, it's more like, OK, if your parents didn't go to university then you also won't go to university, so to say. Because it has not been inculcated at home. And it's very self-evident that if you are in pre-university education (…) and the parents have also gone to university, then you will also go to university. (…)' I: 'So if I understand you correctly, there is a certain stereotype or prejudice, that if your parents didn't study at university, then you won't succeed either?' 17: 'That they mostly don't go do it [study at university], so to say. (…) That you won't even try. I hear that very often. (…) It's just not being expected of them. (…) Or children of a migrant background or so, that you also hear very often. That from them it's also less expected that they end up at higher education (…) That can also be in high school (…) people always say: MAVO [vocational track in high school] is for those with a migrant background, HAVO [higher general track in high school] is mixed, and VWO [pre-university track in high school] is actually only for the Dutch.'	Participant 17 (medicine or medical sciences): woman, no parent completed higher education, one parent in healthcare (not as caregiver), ethnic minority
Unequal opportunities related to financial barriers	
Traditional students	
7: 'Medicine is quite an expensive study. And if you are not from a rich or at least somewhat average family, and if your parents have a somewhat lower education then you won't do a university study so quickly, especially not medicine.'	Participant 7 (medicine): man, one parent completed higher education, both parents in healthcare (one as care assistant+one in policy role), no migration background
Non-traditional students	
9: 'I am willing to do a lot to get through it. But it's not very fair, those paid preparation courses (…) That's why [Dutch university name] has their own courses for that exam, to make it a bit more accessible, free, for a fair chance for everyone (…) There are also all those companies who give trainings for those exams that you need to prepare, but that is not very fair because you pay quite a high amount of money for that (…) It would be an option for me [paid trainings], it depends (…) I am willing to do that, to get extra material and attention (…) I think my parents would pay.'	Participant 9 (medicine): man, higher educated adoptive parents, no parent in healthcare, ethnic minority
Unequal access to better schools	
Traditional students	
1: 'My school [pre-university track only] just provides a lot of challenge [positive] and I can join all sorts of nice projects and clubs at school. Yes, we just have a lot. At my previous school I definitely didn't have the idea that I had access to everything (…) It was a public school (…) I didn't have the idea that I had access to fellow students who challenged and motivated me (…) And here I definitely do, because here I have plenty other people. Secondly, I didn't have the feeling that I had really fine STEM teachers, yes of course there were good ones, but just the excellence like there is at this school, I didn't have there. And there were just less demands on you as a person.'	Participant 1 (medicine): woman, higher educated parents, one parent in healthcare (as caregiver), no migration background

HPE, health professions education.

Table 5 Quotes of theme 2 on mindset and taking responsibility

Quotes	Participants' background characteristics and preferred HPE programme
Taking your own responsibility	
Traditional students	
16: 'I think that if you know what you can do then it really depends on yourself if you get in or not, the time that you put into it. And that the university should take their hands off of it, because you should do it yourself (…) I think it's the most important that you just prepare yourself well. (…) The responsibility lies very much within yourself, I just think that it should really come from within yourself.'	Participant 16 (medicine or biomedical sciences): woman, higher educated parents, no parent in healthcare, migration background, not an ethnic minority
Non-traditional students	
23: 'I had a side job especially for my CV (…) Because I had heard that [university where she wants to study Pharmacy/Pharmaceutical Sciences] asks for a CV (…) I had a job in a drugstore for a year, and now I don't work there anymore, but I just have something that I can put on my CV so I can show: look, I'm serious, I can persist if I really want something. And through the drugstore I also did a sort of course. Through their company, so to say, and it was that of all those [over the counter] medicines, that you must know the names and so on (…) I just want to show that I can do it. If I'm being put in a job, then I can be serious. That was the main reason why I did it.'	Participant 23 (pharmacy or pharmaceutical sciences): woman, higher educated parents, no parents in healthcare, migration background, ethnic minority
The importance of your own mindset	
Traditional students	
1: 'I think it will just help me to develop myself, just personal development in general. Getting to know yourself well. I think that if you are just super steady with planning and studying and you have all elements in your life just well in balance, then you will also show that. I really believe that what you think, that is also who you are. And I think that if you have everything well in order, that then in the end you'll get there anyway, so for me personally that's a thing, that yes if I have just grown personally, then it will help me too because medicine is not only about the science stuff, it's also just about working with clients later. And they also find that important.'	Participant 1 (medicine): woman, higher educated parents, one parent in healthcare (as caregiver), no migration background
5: 'I think it doesn't depend on how high your IQ is but more on how great your motivation is, and how badly you want something. I don't know if it's useful to tell this as well, but I started at [vocational track of high school], so I won't have the highest IQ, but I wanted something so I worked for it, but then it depends maybe more on your motivation than your IQ.'	Participant 5 (medicine): woman, higher educated parents, one parent working in healthcare (board secretary), no migration background
Non-traditional students	
I: 'What would help you to successfully apply to one of these studies?' 21: 'That's quite a difficult question. Showing very strong motivation, also being very motivated so that you can really get admitted. So having a mindset that you will surely be admitted.' I: 'And what do you mean with that?' 21: 'That you don't have fear of failure, that you don't think like "what if I don't get accepted, what should I do then? What would come after this if everything I want doesn't go as planned?" But that you just really keep pushing and of course also have a plan B, but just really think like, "I will succeed", and not like "I don't know if I will succeed" or "I won't succeed".'	Participant 21 (medicine or dentistry): woman, one parent completed higher education, one medical parent (physician), migration background, ethnic minority

CV, curriculum vitae; HPE, health professions education.

background expressed having a language barrier when writing a motivation letter or drafting their resume. Some intentionally read more books and used a dictionary to improve their fluency. Others planned to ask their Dutch language teacher for help. To counter fear of failure, participants used practice exams. Finally, they gathered as much information as possible about HPE programmes to counter study choice doubts.

Access to (high-impact) facilitators was often useful to develop approaches to overcome barriers. For example, healthcare experience helped overcome perceived barriers in unexpected ways. Participant 17, for instance (non-traditional student, no parent completed higher education, one parent in healthcare sector, migration background, ethnic minority), had the highest number of years of healthcare experience of all participants.

Occasionally, she served as interpreter when no official one was available, when dealing with hospital patients who could only speak Turkish. She argued that speaking an additional language would enable her as a doctor to help these patients better. Later in the interview, when discussing barriers to selection, and ethnic discrimination happening at her school and in society, she said that ethnic discrimination was a reason to work even harder to get admitted, as she had seen all those patients with a language barrier. This means that access to (high-impact) facilitators such as healthcare experience can mitigate possible perceived barriers (such as discrimination) which may at first have seemed unrelated.

However, some participants did little or nothing to overcome their barriers, and predominantly suggested ways in which others (eg, universities or hospitals) could help them overcome these barriers. In a number of cases, those others were already doing what the student suggested (eg, organising Open Days or Student-for-a-Day events), but paradoxically, these participants did not make use of these facilitators. Some participants also had facilitators close at hand without making use of them. For example, participant 26 (traditional student, woman, higher educated parents, one medical parent) had access to several physicians through whom she could gain healthcare experience or information, but she had not yet done so. Nor had she taken other action to improve her admission chances. Nevertheless, she believed she had a good chance, as she perceived the programme to be 'destined' for her. This shows a difference in mindset with regard to creating opportunities for oneself and building confidence, compared with other participants who emphasised that only if you work hard enough, you have a chance to be admitted.

DISCUSSION

This study aimed to gain understanding of the perceived facilitators, barriers and the role of social networks for traditional and non-traditional students, and how these influence the decision to apply to an HPE programme. We found four high-impact facilitators to be beneficial in overcoming barriers to apply and in preparation for selection: access to a social network connection working or studying in the medical field, access to correct information, access to healthcare experience and access to a social network connection in higher education. Lack of information was the main barrier while access to social network connections in healthcare was the main facilitator to overcome this barrier. Access to facilitators was distributed unequally, as in our sample, traditional students were more likely to have a parental network in healthcare. However, having access alone is not enough: participants stressed that one needs to make use of available facilitators, to create opportunities and to overcome barriers.

Our results confirm many of the known barriers.[20 27 28 41] They add to the literature by demonstrating in detail the multiple ways in which participants (plan to) overcome them, and *how* having a social network in HPE or the health professions aids them in this pursuit: for example, these persons aided in making a well-informed study choice, assisted in preparing for the selection procedure, helped to get access to correct and valuable information related to HPE and/or healthcare careers, served as role models and, most importantly, helped to gain access to valuable healthcare experience, for example, volunteering, an internship or a paid job.

While we used a constructivist approach to interpret our findings and construct the main themes using thematic analysis, we need to discuss their meaning using theoretical lenses and concepts which focus on the micro level of the individual and on the macro level of social structures and their affordances. On the micro level, the psychological concepts of self-efficacy and agency come into play. Self-efficacy refers to what someone believes about their ability to succeed in specific situations or to accomplish certain tasks.[42] In this case, it concerns a student's belief in their ability to accomplish tasks in preparing for the selection procedure, and/or to succeed in the selection procedure. Agency refers to someone's capacity to act and to make their choices independently.[43] Self-efficacy is the foundation of agency, because to express agency means one believes in one's power to make something happen.[44] In this study, agency relates to whether the student actively looks for (perceived) useful information, acts on knowledge about useful preparatory activities, makes use of social network connections they have in healthcare and decides when and where to ask for support.

However, on the macro level, self-efficacy and agency may be influenced by the social structures in which the student finds oneself and the relative position the student occupies within these social structures. Here, the theory of intersectionality[45] helps to better understand our results. Intersectionality theory holds that identities are multilayered and that on each layer of one's identity, a person can either occupy a position which is privileged and seen as 'the norm' in the context of a particular society, or oppressed and seen as the non-normative 'Other'.[45–47] It thus locates the individual on multiple axes of privilege/oppression that relate to social structures, for example, relating to gender (sexism), ethnic background (racism) or socioeconomic class (classism).[45 48 49] These social structures may influence an individual's development of agency and self-efficacy: traditional students develop those within social structures which privilege them (as they belong to the ethnic majority and have higher educated parents), whereas non-traditional students must develop agency and self-efficacy in a context of social structures that may not privilege them (eg, as they are ethnic minorities and/or have a lower SES background).

It is therefore important to situate our findings and interpret both themes in a wider societal context where social, economic and educational inequalities remain persistent.[46 50 51] Many participants, both traditional and non-traditional, emphasised that their own effort and

mindset are essential to get into their desired programme. They developed their own approach for overcoming obstacles, in which they proactively took action or knew when to ask the right person for help. However, a deeper analysis shows that these participants often already had immediate access to facilitators which presented them with such opportunities. The most important one was an easily accessible social network in healthcare, which provided informal and direct or indirect access to correct information, healthcare experience and other facilitators. This suggests that the easier one's access to a social network in healthcare is, the more natural it is to develop the required self-efficacy and agency to adequately and effectively prepare for the selection procedure. Therefore, access to a social network in healthcare seems to have a positive multiplier effect in all aspects of getting ready for selection. It is possible that since medicine, dentistry and pharmacy are disproportionately populated by students and professionals from similar high SES backgrounds,[5 32 52] high school students from high SES backgrounds may structurally be more likely to know the right alters to easily access a social network in healthcare. Conversely, not having such social network connections may result in a self-selection process for eligible students who decide to refrain from applying, because they neither had the access nor the opportunity to use this facilitator in the development of their self-efficacy and agency.

The exceptions in our study are a few traditional students with access to a social network in healthcare who did not seem to make a sustained effort to prepare for the selection procedure, yet believed they would be admitted because they really wanted it or were 'destined' to do it. Non-traditional students did not demonstrate such a belief. The number of traditional students who were confident that they would get in despite their lack of effort in preparations was small, and we do not know why they held this belief. We hypothesise that the discourse that 'you can be anything you want to be' is easier to adopt when one belongs to higher SES families without a migration background, owing to fewer structural and institutional barriers to be what you want to be.

Other exceptions are a few non-traditional students of disadvantaged backgrounds who perceived barriers but had not thought of ways to overcome them and did not know who or what could help them. This could suggest a 'learned helplessness',[53] possibly stemming from the intersections of disadvantage at which they find themselves.[45] They may have lacked the necessary positive experiences required to build a strong sense of self-efficacy and agency. While other studies[20 28] found deep uncertainty in such non-traditional students when comparing themselves with traditional students, that seemed less pronounced in the present study. This may be because these participants often thought that other potential applicants had those same barriers as well. This finding was not unexpected due to the known degree of (*de facto*) segregation in Dutch education based on SES.[51] Low-SES participants were thus likely surrounded by peers in similar circumstances and were not aware of the numerous facilitators that higher SES participants might be able to draw on. However, we had only a few participants in this group, therefore we cannot be certain if this hypothesis is true.

Our research brought to light a salient finding not reported elsewhere: participants who had access to numerous facilitators acknowledged their privileges over their peers without such access. They often labelled this as unfair or unjust. They also argued that certain selection instruments, on which they expected to have an advantage due to their privileges, had little to do with becoming a good doctor. To our knowledge, this solidarity has not been found earlier in research on selection for HPE programmes. A retrospective multicohort study by our team[32] has reported that applicants to HPE programmes have significantly higher odds of admission if they have one or two parents who were registered healthcare professionals, if their parents belong to the wealthiest 10% of the population, if they are female and if they have no migration background. This supports many of the findings in the present article. It also indicates that the participants who recognised their access to certain facilitators as privileges (which were giving them an advantage in preparing for selection) were correct in their analysis of the structural inequities in getting ready for HPE selection procedures.

Strengths and limitations

A strength of this study is the focus on *how* the social networks of students influence their decision-making process, and *how* exactly these networks provide access to facilitators and result in unequal opportunities, both in practical terms and in developing the self-efficacy and agency that is needed to successfully prepare for the competitive selection procedures of HPE programmes.

All participants of this study attended school in relatively urban areas in the Netherlands because we had difficulty recruiting participants from rural areas. We had only a few participants with an estimated low SES, and no participants with parents on social welfare. The traditional students in our sample were more likely to have parents who worked in the healthcare sector. This may have influenced our results. For example, access to healthcare experience may be more difficult for students in rural areas, where the distance to healthcare institutions is greater than in urban areas. This could mean that the major facilitator in developing the motivation and confidence to apply to an HPE programme is less within the reach of potential rural applicants. To test that hypothesis, further studies could purposively sample these groups.

Another potential limitation is that interviewer LM belongs to the Dutch ethnic majority group. There is a possibility that some ethnic minority students refrained from expressing points of view relating to discrimination. To counter this, LM was aware of this possibility during the interview and did her best to create a safe environment

in which participants might feel more free to talk about their experiences.

As we did not ask participants about the demographic characteristics of their alters, in the way that, for example, Woolf *et al*[30] did (using ethnic group categories and gender), we could not say much with certainty about the potential similarity (or '*homogeneity*'[30]) of participants' social networks. Therefore, we do not know for sure whether social network connections of participants had similar socioeconomic or ethnic backgrounds, and whether this led to important differences between traditional and non-traditional students. We recommend future research to include this dimension of (potentially unequal) access to valuable social network connections.

Implications

Our findings provide direction for universities aiming to remove barriers which enlarge unequal opportunities to participate in HPE programmes. For example, they could abandon selection criteria known to be influenced by factors such as access to a social network in healthcare or SES. They could also focus on providing non-traditional high school students with a network in the medical field, as a medical social network and the access it provides to other facilitators such as information and healthcare experience can take away numerous (psychological) barriers. If barriers for non-traditional students are related to a potential candidate's low SES, policies such as financial support programmes can help promote widening participation in HPE. When unrealistic perceived barriers (based on incorrect information) restrict a student's willingness to try to apply, then this self-selection process could be prevented by a more suitable provision of information. This provision should be specifically designed to successfully reach non-traditional potential candidates, in order to increase their perception of potential candidacy. In combination with equitable admission procedures,[54] this could help HPE programmes to achieve a more representative student population and subsequently a better quality of health education and care.[55]

CONCLUSION

Easy access to social network connections who work or study in the healthcare field can have a positive impact on students' motivation to apply and the ways in which they prepare for the selection procedure. A social network in healthcare expedites access to correct information, healthcare experience and other facilitators. The systemic nature of unequal access to social network connections in healthcare and other facilitators, which results in unequal opportunities for students of different backgrounds to prepare for the selection procedure, is a matter of concern.

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