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Access to medical networks is key in preparation for selection-based admission into Health Professions Education: an interview study

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1 Access to medical networks is key in preparation for selection-based 2 admission into Health Professions Education: an interview study

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36

37 Abstract

38

39 Objectives

40 Health Professions Education (HPE) students are often unrepresentative of the populations they
41 will serve. The underrepresentation of nontraditional students is problematic, because diversity is
42 essential for promoting excellence in health education and care. This study aimed to understand
43 the perceptions of traditional and nontraditional students regarding facilitators and barriers in
44 preparing for HPE selection procedures, and to determine the role of social networks in their
45 decision-making and preparations to apply.

46 Methods

47 A qualitative study was conducted with twenty-six Dutch youth who were interested in
48 university-level HPE programs. Semi-structured interviews and network drawings were analysed
49 using thematic analysis, adopting a constructivist approach.

50 Results

51 Twenty-six high school students participated, with traditional and nontraditional backgrounds,
52 with and without social networks in healthcare and higher education. Two themes were
53 constructed. First, four high-impact facilitators helped to overcome barriers to apply and in
54 preparation for selection: access to a social network connection working or studying in the
55 medical field, to correct information, to healthcare experience, and to a social network
56 connection in higher education. Lack of information was the main barrier, while access to
57 medical network connections was the main facilitator to overcome this barrier. However, this

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3 58 access was unevenly distributed. Second, access alone is not enough: the need for agency to
4
5 59 make use of available facilitators is also essential.
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8 60 **Conclusions**

10
11 61 The themes are discussed using intersectionality. Traditional students with access to facilitators
12
13 62 develop their self-efficacy and agency within social structures that privilege them, whereas
14
15 63 nontraditional students must develop those skills without such structures. Our findings provide
16
17 64 recommendations for the ways in which universities can remove barriers that cause unequal
18
19 65 opportunities to prepare for the selection of HPE programs. Along with equitable admissions,
20
21 66 these recommendations can help to achieve a more representative student population and
22
23 67 subsequently a better quality of health education and care.
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34 70 **Keywords:** selection; facilitators; barriers; medical network; unequal opportunities; access;
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36 71 qualitative study; thematic analysis; traditional students; nontraditional students.
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39 72 **Word count: 5994**

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76 Article summary

77 Strengths and limitations of this study

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

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98 **Background**

99 In many countries, the cohorts trained to become health professionals are unrepresentative of the
100 populations they serve. Health professions education (HPE) students who are admitted
101 disproportionately have highly educated and high-income parents who are more likely to work in
102 the medical field, and often belong to the ethnic majority (1–4). The underrepresentation of
103 nontraditional students is problematic, because diversity is essential in promoting excellence in
104 health education and care (5-7). Here, we define nontraditional students as students whose
105 parents did not complete higher education and/or who have a migration background and belong
106 to an ethnic minority group; and traditional students as students with at least one parent who
107 completed higher education, who have no migration background or are not an ethnic minority
108 (8).

109
110 There is sufficient reason to assume that underrepresentation of nontraditional students is a
111 global phenomenon, as evidence suggests that opportunities to enrol in HPE programs are not
112 equally available to all eligible students (9, 10): Those with nontraditional backgrounds face
113 barriers in selection procedures, and there are indications that they tend to shy away from
114 applying to HPE programs (11-14). The latter is called self-selection. Self-selection refers to
115 students deciding to apply or not based on the information they have (15) and how they estimate
116 their chance of success based on actual and perceived barriers and facilitators. Known barriers
117 include lack of knowledge about the necessary preparations to increase chances of admission
118 (16, 17), or limited access to suitable extracurricular activities (18). Other barriers can be
119 concerns about one's ability to get admitted (19), for example due to perceptions of lower
120 chances of being selected compared to other students (20, 21), fear of not fitting in because of

1
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3 121 one's background (22), or discouragement by teachers (23). These barriers can relate to socio-
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5 122 economic status (SES) (24, 25) and its associated social capital (real or potential resources
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7 123 accessible through a person's networks) and cultural capital (here, the domestic transfer of values
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10 124 relating to education and academic achievement) (26). These factors may partially explain the
11
12 125 underrepresentation of nontraditional students in applicant pools (1).
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17 127 There are also indications that the networks of traditional and nontraditional students play an
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19 128 important role in their decision to apply. For example, Southgate et al. (18) found that all
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21 129 students, but especially nontraditional students, expressed a desire for 'hot knowledge' straight
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23 130 from the source, to motivate their study choice and preparations for admission. Not knowing
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25 131 doctors who served as a hot knowledge source was therefore an important barrier. The lack of a
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27 132 network in the medical field was also found to be a major barrier (20, 27, 28). Without such a
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29 133 network, students experienced more difficulties in acquiring relevant work experience, preparing
30
31 134 for the medical school application, and developing the confidence that the HPE program is the
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33 135 right study choice. These students can also become demotivated by the inequality they perceive
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35 136 (15). However, the exact mechanisms behind *how* access to these networks can facilitate
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38 137 potential applicants, are not clear.
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44 139 The aforementioned literature shows that in many countries there is broad attention to potential
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46 140 inequality of opportunity in access to higher education in general, and HPE programmes in
47
48 141 particular. In The Netherlands, there are also strong indications that HPE students are
49
50 142 unrepresentative for the population as a whole, and concerns exist that the change from lottery
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52 143 admission to selection has negatively influenced student diversity and equitable admissions (21).
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3 144 For example, students with a so-called ‘non-Western’ migration background have lower chances
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5 145 of being selected (4). Men make up approximately 30% of the HPE student population, whereas
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7 146 they make up 50% of the student population that is eligible to apply (Mulder et al, accepted for
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9 147 publication by Medical Teacher). However, research on the detailed demographics of potentially
10
11 148 eligible student and applicant pools of HPE programs, and how exactly the factors which
12
13 149 influence self-selection play a role, is scarce (21). Wouters et al. (15) provided an account of
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15 150 factors that influence Dutch potential applicants’ motivation to apply for medicine. However, it
16
17 151 is not sufficiently known to what extent this process differs between traditional and
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19 152 nontraditional students, nor how people in their networks influence their decision-making. These
20
21 153 potential differences may play an important role in understanding the underrepresentation of
22
23 154 certain sociodemographic groups in HPE programmes. This knowledge is crucial for universities
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25 155 to develop outreach programmes or take away possible barriers, to increase the diversity of the
26
27 156 HPE applicant pool. Therefore, this article aims to fill this knowledge gap by answering the
28
29 157 following research questions: 1) What are the perceptions of high school students of different
30
31 158 backgrounds regarding facilitators and barriers in getting ready for selection and gaining
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33 159 admission to an HPE program? And 2) How do people in the networks of these students
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35 160 influence their decision-making to apply and in their preparations for the selection procedure?
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37 161 Our objective is to explore, rather than compare, what their perceptions and social networks are,
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39 162 and how these interact.
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48 163 Method

52 164 Design and setting

53 165 We adopted a constructivistic approach (29) and conducted semi-structured qualitative interviews
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55 166 with a diverse group of traditional and nontraditional high school students aged 16 years or older,
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3 167 to gain insight into various facilitators and barriers. One-on-one interviews enabled an in-depth
4
5 168 exploration of how participants experience and make sense of their own unique world (29).
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8 169 Both purposive and snowball sampling (30) were used to recruit participants who were eligible
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10 170 for university-level HPE programmes on the basis of their pre-university high school track. We
11
12 171 focused on students who were interested in studying Medicine, Clinical Technology, Pharmacy,
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14 172 Dentistry and Biomedical Sciences, to capture a wider range of potential HPE applicants who
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16 173 were in the process of getting ready for one or more HPE selection procedure(s) which have
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18 174 similar eligibility requirements. In the Netherlands, all HPE programs design their own selection
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20 175 procedure and make use of a limited arsenal of selection instruments, such as previous academic
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22 176 achievement, work samples, admission exams, or assessment of extracurricular activities (31).
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27 177 Letters and recruitment posters were sent by email and regular mail to 76 schools in 6 provinces
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29 178 of the Netherlands, because we were interested in a diversity of backgrounds and experiences
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31 179 (purposive sampling). Participants were also asked if they knew other potential participants
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33 180 (snowball sampling). They were interviewed at or near their own high school, so they would feel
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35 181 at ease in a familiar environment. We decided that data collection would be concluded once data
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37 182 sufficiency was achieved, meaning once two subsequent interviews did not yield new insights
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39 183 into the research topics (32).
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44 184 At the start of the interview, participants filled out a form asking about their gender, parents'
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46 185 occupations, and ethnic background (all free text) and highest parental education levels (multiple
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48 186 choice). Parental education levels and occupations were used to determine first-generation
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50 187 student status and whether participants had a parental network in the medical field.
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3 188 The first part of the interview focused on the opinions about and expectations of the selection
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5 189 procedures, their personal preparation, and their current and potential facilitators and barriers
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8 190 (see Appendix 1 for topic list). The second part consisted of the student drawing two networks
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10 191 by hand: one of the people who play a role in making their study choice, the other of the people
11
12 192 in their network who can help them prepare for the selection procedure. While drawing,
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14 193 participants were asked how these people played a role in both processes, and in what way they
15
16 194 related to these persons. These drawings were used for stimulated recall and enabled the research
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18 195 team to gain insight into the different (types of) networks of participants, and which type of
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20 196 network connections played facilitating roles in the process of choosing an HPE program and
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22 197 preparing for selection.
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27 198 **Research team**

28
29 199 The team consisted of researchers with various professional backgrounds (in sociology,
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31 200 psychology, educational science, pharmacy, and medicine), who share a mutual interest in the
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33 201 subject of equitable opportunities in HPE. [A1], [A2], [A4], [A5] and [A6] were first-generation
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35 202 students. [A3] was a traditional student. [A7] has an ethnic minority background. The diversity
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37 203 of our backgrounds encouraged reflexivity (33) and critical dialogue, ensured we interpreted the
38
39 204 data using different theoretical and conceptual lenses, and resulted in proactively looking for
40
41 205 potential blind spots. For example, we had a discussion about the potential role of the
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43 206 interviewer's identity (Author 1) in interviewing participants with a (visibly or invisibly)
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45 207 different background. This discussion led us to organise practice interviews with medical
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47 208 students. Their feedback yielded interview questions that were more sensitive to the lived
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49 209 experiences of potential participants.
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210 **Patient and Public Involvement**

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

213 **Data analysis**

214 We used a social constructivist paradigm for our data analysis, assuming that there are multiple
215 realities, as each student holds a unique world perspective. This perspective is subjective and
216 based on their individual social location and the social conditions under which their knowledge
217 was formed (34). Therefore, we did not start with a specific theory to interpret our results, but
218 inductively interpreted the meanings of participants' responses (30) to construct our themes
219 using thematic analysis. We selected this method as it is a useful tool to seek understanding of
220 the experiences, thoughts and behaviours of our participants (35). Figure 1 shows the steps taken
221 in the data analysis process by the different members of the research team, based on the six-step
222 framework described by Kiger and Varpio (35).

223 **[Figure 1]**

225 **Results**

226 **Participants**

227 We interviewed 26 high school students from 14 schools in 5 cities and 1 small town, between
228 June 2019 and March 2020. They were enrolled in the 4th or 5th (penultimate) year of the science-
229 oriented pre-university tracks, which give access to HPE programs. Interviews lasted for 30–96
230 minutes. The demographic composition of the sample is summarised in Table 1. Participants
231 with a migration background belong to the first or second generation. We did not observe

232 differences on the basis of preferred HPE programmes. A flowchart portraying participants' core
 233 utterances (Figure 2) was made to enable a deeper understanding of *how* access to (perceived)
 234 facilitators helped them to overcome their (perceived) barriers in the process of developing their
 235 motivation to study in an HPE program, and in preparing for the selection procedure.

236 **Table 1: Participants' background characteristics**
 237

Migration background	
No migration background	12
Migration background & ethnic minority	11
Migration background & 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 traditional student status & parental network in healthcare	
Traditional student* & parental network in healthcare	8
Traditional student* & no parental network in healthcare	4
Non-traditional student** & parental network in healthcare	4
Non-traditional student** & no parental network in healthcare	10
Preferred HPE program (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	

238 There were numerous factors that participants experienced as facilitating or presenting a barrier
 239 to pursuing and entering an HPE program (Table 2). These factors had an influence on their
 240 motivation to pursue an HPE program. We developed two main themes based on the interviews,
 241 the network drawings and the flowchart (Figure 2). These themes relate to 1) students' unequal
 242

243 access to high-impact facilitators, and 2) students' mindset and responsibility to use available
 244 facilitators, to actively create opportunities for oneself and to overcome barriers. As the
 245 perceived facilitators and barriers were very intertwined with participants' networks, the themes
 246 relate to both research questions simultaneously.

247 **Table 2: Factors students experienced as facilitating or presenting a barrier to**
 248 **pursuing an HPE program**

Facilitators	Barriers
Having a social network connection in the medical field	Doubts about study choice (e.g. due to length or difficulty of study, negative stories, feelings of inaptitude)
Having role models in the medical field	Lack of information (e.g. about the content or difficulty of the HPE program, 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 they 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 program
The desire to help people	Socio-cultural 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 program	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 specialize in a particular health professions field	Lack of time to attend Student-for-a-Day/Open Days
Being a patient	Meeting people who failed or regret HPE study choice
Medical master classes at university	
Being family of a (deceased) patient	
Participation in extracurricular programs relating to HPE programs	
Medical TV series	

250
 251 **Theme 1: Access to high-impact facilitators is perceived as very beneficial for**
 252 **preparation, but this access is distributed unequally**

253 The high school students in our sample were interested in different HPE programmes at different
 254 universities and thus had different selection procedures to prepare for. In the process of getting
 255 ready for these respective procedures, participants perceived a great number of facilitators (Table

1
2
3 256 2). We found that four of those had a high impact, because not only were they perceived as
4
5 257 helpful in preparing to apply or in having a higher chance of being admitted, but also because
6
7 258 they provided access to other facilitators. The first and most important one was **access to a social**
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9
10 259 **network connection working or studying in the medical field**, such as family members or
11
12 260 friends. These medical network connections were role models, aided in making a study choice,
13
14 261 and/or were expected to assist in preparing for the selection procedure. For example, Participant
15
16 262 7 (interested in Medicine, man, one parent completed higher education, both parents in
17
18 263 healthcare, no migration background) explained:

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21
22 264 *“I try broadening my knowledge in the area of anatomy, which is going quite well since my sister*
23
24 265 *is studying for her Nursing degree. So she has to know all sorts of things about anatomy. And my*
25
26 266 *mom is also doing different things for her Personal Care Assistant degree, so I also learn from*
27
28 267 *that. So that gives me an advantage compared to other people.”*

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31
32 268 Network connections in the medical field also helped participants to get **access to correct and**
33
34 269 **valuable information related to health professions education and healthcare**, which was a
35
36 270 second important facilitator. This included information about selection, first-hand knowledge of
37
38 271 the healthcare sector, inspiring or informative stories, or access to medical literature. It improved
39
40 272 participants’ motivation, and strengthened their conviction that the HPE programme was the
41
42 273 right study choice. It assisted in choosing a strategic approach to the selection procedure, as they
43
44 274 knew what the selection requirements were. Participant 16 (interested in Medicine or Biomedical
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46 275 Sciences, woman, higher-educated parents, no parents in healthcare, migration background, not
47
48 276 an ethnic minority) got in contact with a care home physician through a friend’s father (also a
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50 277 physician):
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3 278 *“He helped me because I asked him very much, not about selection but about the study itself (...)*
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5 279 *And also, yeah just about what the study contains, content-wise. And that also helped me to get*
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7
8 280 *even more enthusiastic about the study program. So that strengthened it, so to say”.*
9

10 281 Lacking access to a network in the medical field often resulted in the barrier of lacking correct or
11
12 282 useful information. Lack of information led some participants to have doubts about their study
13
14 283 choice or expected chance of successful admission, sometimes resulting in feelings of being
15
16 284 insufficiently prepared. Although certain information can also be gained through other avenues
17
18 285 than a medical network, such as by attending Open Days, participants emphasized that such
19
20 286 avenues mainly provide general information, not the ‘insider’ information they were looking for.

21
22 287 The third important facilitator was **healthcare experience**, e.g., through volunteering,
23
24
25 288 shadowing a doctor, an internship or a paid job. A social network connection in healthcare made
26
27 289 it easier to gain such experience, but some participants found ways without a network.

28
29 290 Participants described how healthcare experience strengthened their motivation, and supported
30
31 291 overcoming psychological barriers, such as study choice doubts, fear of failure, pressure or stress
32
33 292 regarding competition with others. It also provided them with access to other facilitators: they
34
35 293 got a chance to build their CV (which helped build their confidence in successful admission);
36
37 294 they had access to more information about the medical field, the selection procedure, the content
38
39 295 of the HPE programme, and future career options; and they gained valuable medical network
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41 296 connections. Furthermore, it led to inspiring patient encounters, which enhanced motivation.

42
43 297 This made healthcare experience more valuable than simply a CV-building activity to increase
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45 298 their chances of admission. For example, Participant 17 (interested in Medicine or Medical
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47 299 Sciences, woman, no parent completed higher education, one parent in healthcare as care
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49 300 advisor, migration background, ethnic minority) explained:
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3 301 *“By shadowing doctors I already learn quite a lot. Because every time you walk there, then you*
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5 302 *hear so many terms that you really don’t understand, and especially in the beginning I really*
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7 303 *didn’t understand anything. And every time you hear something, you can look it all up, or ask,*
8
9 304 *they just like it if you ask questions. So I find that a nice way to learn too. I have also seen how*
10
11 305 *you need to stitch, that was very cool (...) I shadowed a surgeon and was allowed to see the*
12
13 306 *wound, and he said: ‘do you see that hamstring there?’ and I said: ‘which one?’ and he said*
14
15 307 *‘well, put on a glove and come here’. (...) I really liked it, yes, because I was allowed to feel it*
16
17 308 *and that was so cool”.*

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22 309 For more details on the facilitating effects of having a social network connection in the
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24 310 healthcare sector, see Table 3 and Figure 2.

25 26 27 28 311 **[Figure 2]**

29
30 312 The fourth important facilitator was **having family members or other network connections**
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32 313 **who graduated from or are currently enrolled in higher education.** Several participants
33
34 314 described how parents or siblings could help them in their decision-making process to pursue a
35
36 315 university-level HPE program, and how they were able to assist them better thanks to their
37
38 316 knowledge of navigating the university system or the HPE selection procedure. For example,
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40 317 Participant 23 (interested in Pharmacy or Pharmaceutical Sciences, woman, higher-educated
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42 318 parents, no parents in healthcare, migration background, ethnic minority) explained how she
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44 319 acquired information about study programmes:
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50 321 *“I mainly read a lot about the universities, about the study programmes. And really read in*
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52 322 *detail about what they expect, what they want from you. But sometimes it was a bit too much*
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54 323 *information and then I didn’t understand everything they meant, so then I go after that some*
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324 *more (...). And I know a lot of acquaintances, who all studied [at university] as well. So usually,*
 325 *when I know that someone studied something in particular, then I ask: okay, and what do you*
 326 *think of it?"*

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

332 *"Maybe other future medicine students have parents who also have their education level or*
 333 *completed the same study, and I don't have that. Also not in the wider family (...). For example,*
 334 *their parents could say like this is how a selection procedure would go, because maybe they*
 335 *already did it, or another one, that maybe they could give advice on how that goes and how you*
 336 *should do that. But I have to do that myself."*

337 In summary, access to a social network connection working or studying in the medical field, and
 338 a social network connection in higher education were important in gaining access to a range of
 339 other facilitators, such as access to correct information and healthcare experience.

340 **Table 3: Quotes of theme 1 on the facilitating effects of a social network in**
 341 **healthcare**

Access to correct and valuable information	
Quotes	Participants' background characteristics and preferred HPE program
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?"	Participant 22 (Medicine or Biomedical Sciences): woman, higher-educated parents, one parent in healthcare (financial advisor), no migration background

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.”	
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, he 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 6 th [final 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 hematologist (...) 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 Hematology department a lot, I could also hear often from the hematologists 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

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343 **Subtheme: Unequal opportunities to prepare for selection**
344 Our findings indicated that access to facilitators is distributed unequally. For example,
345 participation in preparatory and mentoring programs that are offered by universities helped some
346 participants to overcome the barriers of a lack of information or a network. However, pre-
347 university programs were not accessible to all interested participants due to limited availability

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3 348 of places, a high grade point average (GPA) requirement, and/or high costs. This was perceived
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5 349 as a barrier by several participants.
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8 350 Some participants explicitly described the lack of access to a certain facilitator (e.g., higher-
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10 351 educated parents, a medical network) as a barrier. However, for most it remained implicit: when
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12 352 they described the barriers they perceived (e.g., not knowing enough about possible career
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14 353 options after graduating from an HPE program), they did not explicitly say that these barriers
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16 354 were caused by a lack of access to e.g., healthcare experience. On the other hand, participants
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18 355 with more resources, facilitators and useful network connections at their disposal recognized
19
20 356 their advantages over their peers who lacked them and judged this as unequal or unfair. This
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22 357 perceived inequality or unfairness was a recurring theme, and it related to different elements of
23
24 358 the preparation process: GPA, CV-building, pre-university programs, paid entrance exam
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26 359 trainings, parental backgrounds, and access to university or an HPE study in general. For
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28 360 example, Participant 16 (preferred HPE program: Medicine or Biomedical Sciences, woman,
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30 361 higher-educated parents, no parent in healthcare, migration background, not an ethnic minority)
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32 362 argued:
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39 363 *“I know entire programs exist that really cost 300 Euros, that help you with your admission. But*
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41 364 *I don't know, I feel that's a bit unfair. Because suppose you don't have a lot of money, then you*
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43 365 *cannot join that. That because of that, people with more money get in more easily. So I don't feel*
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45 366 *like joining that (...) I would be able to pay, and my parents could also pay for it. But it's more*
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47 367 *out of principle that that I don't want to participate in that.”*
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51 368 Participant 1 (preferred HPE program: Medicine, woman, higher-educated parents, one parent in
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53 369 healthcare (as caregiver), no migration background) told the story of a classmate with highly
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55 370 educated refugee parents, who were doctors in their home country but were not allowed to
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371 practice medicine in The Netherlands. She argued that, if they would have been able to be
 372 practicing physicians here, their daughter would have more contacts in the medical field. When
 373 asked what difference this could have made, she answered:

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

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

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

387 **Table 4: Quotes of subtheme 1 on unequal opportunities to prepare for**
 388 **selection**

Unequal opportunities related to parental education or profession	
Quotes	Participants’ background characteristics and preferred HPE program
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	Participant 12 (Medicine, Biomedical Science, or Clinical Technology):

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school courses, then you can't ask your parents for that. And I do have an advantage there.	woman, higher-educated parents, no parent in healthcare, migration background, not an ethnic minority
Non-traditional students	
<p>17: "If you look at the different cultures slash 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?"</p> <p>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"</p>	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 honest, those paid preparation courses (...) That's why Erasmus 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 beta 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

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392 **Theme 2: Access alone is not enough: the need for agency to make use of available**
 393 **facilitators, to create opportunities and to overcome barriers**

394 Once participants decided to pursue an HPE program, they entered the phase of preparing to
 395 apply. Many participants stressed the importance of taking one's own responsibility and having
 396 the right mindset or attitude in this regard to adequately prepare oneself. For example, Participant
 397 1 argued:

398 *"I think that if I put my mind to medicine, then I have a large chance of success. I do have... yes,*
 399 *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*
 400 *know that in principle I should be able to do it, so I think that it's really up to yourself. Do I want*
 401 *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*
 402 *to be able to look back later and think: 'Yes, even if I had wanted to do more, I couldn't even*
 403 *have done it'. (...) But I do think it will be difficult, so to say, it's not like you just get in easily, so*
 404 *I definitely would have to do my best."*

405 Table 5 shows more quotes related to this theme.

406 **Table 5: Quotes of theme 2 on mindset and taking responsibility**

Taking your own responsibility	
Quotes	Participants' background characteristics and preferred HPE program
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,	Participant 23 (Pharmacy or Pharmaceutical Sciences): woman, higher-educated parents, no parents in healthcare, migration background, ethnic minority

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.	
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

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409 Although participants perceived numerous barriers, many had already developed approaches to
 410 overcome these. For example, several participants with a migration background expressed
 411 having a language barrier when writing a motivation letter or drafting their resume. Some
 412 intentionally read more books and used a dictionary to improve their fluency. Others planned to
 413 ask their Dutch language teacher for help. To counter fear of failure, participants used practice
 414 exams. Finally, they gathered as much information as possible about HPE programs to counter
 415 study choice doubts.

416 Access to (high-impact) facilitators was often useful to develop approaches to overcome barriers.

417 For example, healthcare experience helped to overcome perceived barriers in unexpected ways.

418 Participant 17 for instance (nontraditional student, no parent completed higher education, one

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3 419 parent in healthcare sector, migration background, ethnic minority) had the highest number of
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5 420 years of healthcare experience of all participants. Occasionally, she served as interpreter when no
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7 421 official one was available, when dealing with hospital patients who could only speak Turkish.
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9 422 She argued that speaking an additional language would enable her as a doctor to help these
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11 423 patients better. Later in the interview, when discussing barriers to selection, and ethnic
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13 424 discrimination happening at her school and in society, she said that ethnic discrimination was a
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15 425 reason to work even harder to get admitted, as she had seen all those patients with a language
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17 426 barrier. This means that access to (high-impact) facilitators such as healthcare experience can
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19 427 mitigate possible perceived barriers (such as discrimination) which may at first have seemed
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21 428 unrelated.
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27 429 However, some participants did little or nothing to overcome their barriers, and predominantly
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29 430 suggested ways in which others (e.g., universities or hospitals) could help them overcome these
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31 431 barriers. In a number of cases, those others were already doing what the student suggested (e.g.,
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33 432 organising Open Days or Student-for-a-Day events) but paradoxically, these participants did not
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35 433 make use of these facilitators. Some participants also had facilitators close at hand without
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37 434 making use of them. For example, participant 26 (traditional student, woman, higher-educated
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39 435 parents, one medical parent) had access to several physicians through whom she could gain
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41 436 healthcare experience or information, but she had not yet done so. Nor had she taken other action
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43 437 to improve her admission chances. Nevertheless, she believed she had a good chance, as she
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45 438 perceived the program to be “destined” for her. This shows a difference in mindset with regard to
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47 439 creating opportunities for oneself and building confidence, compared to other participants who
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51 440 emphasized that only if you work hard enough, you have a chance to be admitted.
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441 Discussion

442 This study aimed to gain understanding of the perceived facilitators, barriers and the role of
443 social networks for traditional and nontraditional students, and how these influence the decision
444 to apply to an HPE program. We found four high-impact facilitators to be beneficial in
445 overcoming barriers to apply and in preparation for selection: access to a social network
446 connection working or studying in the medical field, access to correct information, access to
447 healthcare experience, and access to a social network connection in higher education. Lack of
448 information was the main barrier, while access to social network connections in the medical field
449 was the main facilitator to overcome this barrier. Access to facilitators is distributed unequally,
450 as evidenced by e.g., the quotes in table 4. However, having access alone is not enough: one
451 needs to make use of available facilitators, to create opportunities and to overcome barriers. Our
452 results confirm many of the known barriers (20, 27, 28, 36). They add to the literature by
453 demonstrating in detail the multiple ways in which participants (plan to) overcome them, and
454 *how* having a social network in HPE or the health professions aids them in this pursuit: for
455 example, these persons aided in making a well-informed study choice, assisted in preparing for
456 the selection procedure, helped to get access to correct and valuable information related to health
457 professions education and/or healthcare careers, served as role models, and, most importantly,
458 helped to gain access to valuable healthcare experience, e.g., volunteering, an internship or a
459 paid job.

460 While we used a constructivistic approach to interpret our findings and construct the main
461 themes using thematic analysis, we need to discuss their meaning using theoretical lenses and
462 concepts which focus not only on the micro level of the individual, but also on the macro level of
463 social structures and their affordances. On the micro level, the psychological concepts of self-

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3 464 efficacy and agency come into play. Self-efficacy refers to what someone believes about their
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5 465 ability to succeed in specific situations or to accomplish certain tasks (37). In this case, it
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7 466 concerns a student's belief in their ability to accomplish tasks in preparing for the selection
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9 467 procedure, and/or to succeed in the selection procedure. Agency refers to someone's capacity to
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11 468 act and to make their choices independently (38). Self-efficacy is the foundation of agency,
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13 469 because to express agency means one believes in one's power to make something happen (39). In
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15 470 this study, agency relates to whether the student actively looks for (perceived) useful
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17 471 information, acts upon knowledge about useful preparatory activities, makes use of network
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19 472 connections they have in the medical field, and decides when and where to ask for support.
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24 473 However, on the macro level, self-efficacy and agency may be influenced by the social structures
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26 474 in which the student finds oneself and the relative position the student occupies within these
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28 475 social structures. Here, the theory of intersectionality (40) helps to better understand our results.
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30 476 Intersectionality theory holds that identities are multi-layered and that on each layer of one's
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32 477 identity, a person can either occupy a position which is privileged and seen as 'the norm' in the
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34 478 context of a particular society, or oppressed and seen as the non-normative 'Other' (40-42). It
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36 479 thus locates the individual on multiple axes of privilege/oppression that relate to social
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38 480 structures, for example relating to gender (sexism), ethnic background (racism), or socio-
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40 481 economic class (classism) (40, 43, 44). These social structures may influence an individual's
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42 482 development of agency and self-efficacy: traditional students develop those within social
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44 483 structures which privilege them (as they belong to the ethnic majority and have higher-educated
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46 484 parents), whereas nontraditional students must develop agency and self-efficacy in a context of
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48 485 social structures that may not privilege them (e.g., as they are ethnic minorities and/or have a
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50 486 lower SES background).

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3 487 It is therefore important to situate our findings and interpret both themes in a wider societal
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5 488 context where social, economic and educational inequalities remain persistent (41, 45, 46).
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8 489 Many participants, both traditional and nontraditional, emphasized that their own effort and
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10 490 mindset are essential to get into their desired program. They developed their own approach for
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12 491 overcoming obstacles, in which they proactively took action or knew when to ask the right
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14 492 person for help. However, a deeper analysis shows that these participants often already had
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16 493 immediate access to facilitators which presented them with such opportunities. The most
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18 494 important one was a social network in the medical field, which provided easy access to correct
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20 495 information, healthcare experience, and other facilitators. This suggests that the easier one's
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22 496 access to a medical network is, the more natural it becomes to develop the required self-efficacy
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24 497 and agency to adequately and effectively prepare for the selection procedure. Therefore, access
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26 498 to a medical network seems to have a positive multiplier effect in all aspects of getting ready for
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28 499 selection. Conversely, not having such social network connections may result in a self-selection
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31 500 process for eligible students who decide to refrain from applying, because they neither had the
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33 501 access nor the opportunity to use this facilitator in the development of their self-efficacy and
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35 502 agency.
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41 503 The exceptions in our study are a few traditional students with access to a medical network who
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43 504 did not seem to make a sustained effort to prepare for the selection procedure, yet believed they
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45 505 would be admitted because they really wanted it or were "destined" to do it. Nontraditional
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47 506 students did not demonstrate such a belief. The number of traditional students who were
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49 507 confident that they would get in despite their lack of effort in preparations was small, and we do
50
51 508 not know why they held this belief. We hypothesize that the discourse that 'you can be anything
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53 509 you want to be' is easier to adopt when one belongs to higher SES families without a migration
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3 510 background. After all, in that case there are fewer structural and institutional barriers to, indeed,
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5 511 become that which you want to be.
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8 512 Other exceptions are a few nontraditional students of disadvantaged backgrounds who perceived
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10 513 barriers but had not thought of ways to overcome them and did not know who or what could help
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12 514 them. This could suggest a 'learned helplessness' (47), possibly stemming from the intersections
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14 515 of disadvantage at which they find themselves (40). They lacked the necessary positive
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16 516 experiences required to build a strong sense of self-efficacy and agency. While other studies (20,
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18 517 28) found deep uncertainty in such nontraditional students when comparing themselves with
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20 518 traditional students, that seemed less pronounced in the present study. This may be because these
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22 519 participants often thought that other potential applicants had those same barriers as well. This
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24 520 finding was not unexpected, due to the known degree of (*de facto*) segregation in Dutch
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26 521 education based on SES (46). Low-SES participants were thus likely surrounded by peers in
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28 522 similar circumstances and were not aware of the numerous facilitators that higher-SES
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30 523 participants might be able to draw upon. However, we had only a few participants in this group,
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32 524 therefore we cannot be certain if this hypothesis is true.
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39 525 Our research brought to light a salient finding not reported elsewhere: participants who had
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41 526 access to numerous facilitators, acknowledged their privileges over their peers without such
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43 527 access. They often labelled this as unfair or unjust. They also argued that certain selection
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45 528 instruments, on which they expected to have an advantage due to their privileges, had little to do
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47 529 with becoming a good doctor. To our knowledge, this solidarity has not been found earlier in
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49 530 research on selection for HPE programs.
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52 53 54 531 **Strengths and limitations** 55 56 57 58 59 60

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3 532 A strength of this study is the focus on *how* the social networks of students influence their
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5 533 decision-making process, and *how* exactly these networks provide access to facilitators and result
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7 534 in unequal opportunities, both in practical terms and in developing the self-efficacy and agency
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9 535 that is needed to successfully prepare for the competitive selection procedures of HPE programs.
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13 536 All participants of this study attended school in relatively urban areas in the Netherlands because
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15 537 we had difficulty recruiting participants from rural areas. We had only a few participants with an
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17 538 estimated low SES, and no participants with parents on social welfare. The traditional students in
18
19 539 our sample were more likely to have parents who worked in the healthcare sector. This may have
20
21 540 influenced our results. For example, access to healthcare experience may be more difficult for
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23 541 students in rural areas, where the distance to healthcare institutions is greater than in urban areas.
24
25 542 This could mean that the major facilitator in developing the motivation and confidence to apply
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27 543 to an HPE program, is less within the reach of potential rural applicants. To test that hypothesis,
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29 544 further studies could purposively sample these groups.
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34 545 Another potential limitation is that interviewer [A1] belongs to the Dutch ethnic majority group.
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36 546 There is a possibility that some ethnic minority students refrained from expressing points of view
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38 547 relating to discrimination. To counter this, [A1] was aware of this possibility during the
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40 548 interview and did her best to create a safe environment in which participants might feel more free
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42 549 to talk about their experiences.
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47 550 **Implications**

48 551 Our findings provide direction for universities aiming to remove barriers which enlarge unequal
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50 552 opportunities to participate in HPE programs. For example, they could abandon selection criteria
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52 553 known to be influenced by factors such as access to a medical network or SES. They could also
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54 554 focus on providing nontraditional high school students with a network in the medical field, as a
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3 555 medical network and the access it provides to other facilitators such as information and
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5 556 healthcare experience can take away numerous (psychological) barriers. If barriers for
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7 557 nontraditional students are related to a potential candidate's low SES, policies such as financial
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9 558 support programs can help to promote widening participation in HPE. When unrealistic
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11 559 perceived barriers (based on incorrect information) restrict a student's willingness to try to apply,
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13 560 then this self-selection process could be prevented by a more suitable provision of information.
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15 561 This provision should be specifically designed to successfully reach nontraditional potential
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17 562 candidates, in order to increase their perception of potential candidacy. In combination with
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19 563 equitable admissions procedures (48), this could help HPE programs to achieve a more
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21 564 representative student population and subsequently a better quality of health education and care
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23 565 (49).

566 Conclusion

567 Easy access to people who work or study in the medical field can have a positive impact on
568 students' motivation to apply and their preparations for the selection procedure. A medical
569 network expedites access to correct information, healthcare experience, and other facilitators.
570 The systemic nature of unequal access to medical networks and other facilitators, which results
571 in unequal opportunities for students of different backgrounds to prepare for the selection
572 procedure, is a matter of concern.

573 Declarations

574 Ethics approval and consent to participate

575 The Ethics Committee at Amsterdam UMC, location VUmc approved this study (file no.
576 2019.274). Participation was voluntary and the participants were informed that they could
577 withdraw from the study at any point in time. Participants gave written, informed consent. In the
578 Netherlands, 16-year-olds do not need parental consent to participate in research. Interviews
579 were audio-recorded and transcribed. Data were pseudonymised and only [A1] had access to
580 traceable data. Participants were given a €10 gift card each.

581 Consent for publication

582 Participants were informed in the study information letter that their data would be anonymized
583 for publication. Participants are unidentifiable in this manuscript.

584 Availability of data and materials

585 The data that support the findings of this study are not publicly available due to them containing
586 information that could compromise research participant privacy and consent.

587 Competing interests

588 The authors declare that they have no competing interests.

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592

593 Author contributions

594 AW, JHR, GC and RAK conceived the idea for the research. LM, AW, and RAK designed the
595 research. LM interviewed all participants. LM, AW, SFK, and RAK analysed the data. LM wrote
596 the first draft of the article and all co-authors contributed to the article with important critical
597 revisions in multiple revision rounds. The final manuscript is the result of the combined expertise
598 of all authors and is approved for publication by all authors. All individuals who qualify for
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603 References

- 604 1. Alexander K, Cleland J. Social inclusion or social engineering? The politics and reality of
605 Widening Access to medicine in the UK. In: Shah M, McKay J, editors. Achieving Equity and
606 Quality in Higher Education: Global Perspectives in an Era of Widening Participation. Cham,
607 Switzerland: Springer; 2018. p. 143-72.
- 608 2. Griffin B, Hu W. The interaction of socio-economic status and gender in widening
609 participation in medicine. *Med Educ.* 2015;49(1):103-13.
- 610 3. Van den Broek A, de Korte K, Mulder J, Bendig-Jacobs J. Numerus fixus, selectie en
611 kansengelijkheid in het wetenschappelijk onderwijs. 2018.
- 612 4. Van den Broek A, Mulder J, de Korte K, Bendig-Jacobs J, van Essen M. Selectie bij
613 opleidingen met een numerus fixus & de toegankelijkheid van het hoger onderwijs. Onderzoek in
614 opdracht van het Ministerie van OCW, Nijmegen, ResearchNed. 2018.

- 1
2
3 615 5. Steven K, Dowell J, Jackson C, Guthrie B. Fair access to medicine? Retrospective
4
5 616 analysis of UK medical schools application data 2009-2012 using three measures of
6
7 617 socioeconomic status. *BMC Med Educ*. 2016;16(1):11.
8
9
10 618 6. Griffin-Famble C, Valentine P, Jackson-Hammond C. Call for a new agenda: educational
11
12 619 policies and practices addressing a more diverse health professions workforce. *Journal of Best*
13
14 620 *Practices in Health Professions Diversity*. 2009;2(2):1-16.
15
16
17 621 7. Clayborne EP, Martin DR, Goett RR, Chandrasekaran EB, McGreevy J. Diversity
18
19 622 pipelines: The rationale to recruit and support minority physicians. *JACEP Open*.
20
21 623 2021;2:e12343.
22
23
24 624 8. Stegers-Jager K, Themmen A, Cohen-Schotanus J, Steyerberg E. Predicting performance:
25
26 625 relative importance of students' background and past performance. *Med Educ* 2015;49(9):933–
27
28 626 45.
29
30
31 627 9. Alexander K, Fahey Palma T, Nicholson S, Cleland J. 'Why not you?' Discourses of
32
33 628 widening access on UK medical school websites. *Med Educ*. 2017;51(6):598-611.
34
35
36 629 10. Niven V, Andiappan M, Cabot L, Gallagher JE. Embarking on a professional career:
37
38 630 social advantage in dentistry and medicine. UK dental and medical student applications and
39
40 631 admissions, 1996-2011. *British Dental Journal*. 2019;227(5):411-8.
41
42
43 632 11. Grafton-Clarke C. Is it too difficult for disadvantaged applicants to get into medical
44
45 633 school? *Med Teach*. 2016;38(11):1184.
46
47
48 634 12. Lievens F, Patterson F, Corstjens J, Martin S, Nicholson S. Widening access in selection
49
50 635 using situational judgement tests: evidence from the UKCAT. *Med Educ*. 2016;50(6):624-36.
51
52
53
54
55
56
57
58
59
60

- 1
2
3 636 13. Puddey IB, Mercer A, Carr SE, Loudon W. Potential influence of selection criteria on the
4
5 637 demographic composition of students in an Australian medical school. *BMC Med Educ*.
6
7 638 2011;11(1):97.
8
9
10 639 14. Wouters A, Croiset G, Kusurkar R. Selection and lottery in medical school admissions:
11
12 640 who gains and who loses? *MedEdPublish*. 2018;7(4):50.
13
14 641 15. Wouters A, Croiset G, Isik U, Kusurkar RA. Motivation of Dutch high school students
15
16 642 from various backgrounds for applying to study medicine: a qualitative study. *BMJ Open*.
17
18 643 2017;7(5):e014779.
19
20
21 644 16. Laurence CO, Zajac IT, Lorimer M, Turnbull DA, Sumner KE. The impact of
22
23 645 preparatory activities on medical school selection outcomes: a cross-sectional survey of
24
25 646 applicants to the university of Adelaide medical school in 2007. *BMC Med Educ*. 2013;13:159.
26
27
28 647 17. Wright S. Medical school personal statements: a measure of motivation or proxy for
29
30 648 cultural privilege? *Adv Health Sci Educ*. 2015;20(3):627–43.
31
32
33 649 18. Southgate E, Kelly BJ, Symonds IM. Disadvantage and the ‘capacity to aspire’ to
34
35 650 medical school. *Med Educ*. 2015;49(1):73-83.
36
37
38 651 19. Greenhalgh T, Seyan K, Boynton P. "Not a university type": focus group study of social
39
40 652 class, ethnic, and sex differences in school pupils' perceptions about medical school. *BMJ*.
41
42 653 2004;328:1541
43
44 654 20. Ball R, Alexander K, Cleland J. “The biggest barrier was my own self”: the role of social
45
46 655 comparison in nontraditional students’ journey to medicine. *Perspect Med Educ*. 2020;9:147-56.
47
48
49 656 21. Wouters A. Getting to know our nontraditional and rejected medical school applicants.
50
51 657 *Perspect Med Educ*. 2020;9:132-4.
52
53
54
55
56
57
58
59
60

- 1
2
3 658 22. Mathers J, Parry J. Why are there so few working-class applicants to medical schools?
4
5 659 Learning from the success stories. *Med Educ.* 2009;43(3):219-28.
6
7
8 660 23. McHarg J, Mattick K, Knight LV. Why people apply to medical school: implications for
9
10 661 widening participation activities. *Med Educ.* 2007;41(8):815-21.
11
12 662 24. Martin AJ, Beska BJ, Wood G, Wyatt N, Codd A, Vance G, et al. Widening interest,
13
14 663 widening participation: factors influencing school students' aspirations to study medicine. *BMC*
15
16 664 *Med Educ.* 2018;18:117.
17
18
19 665 25. Sianou-Kyrgiou E, Tsiplakides I. Similar performance, but different choices: social class
20
21 666 and higher education choice in Greece. *Studies in Higher Educ.* 2011;36(1):89-102.
22
23
24 667 26. Bourdieu P. The Forms of Capital. In: Richardson J, editor. *Handbook of Theory and*
25
26 668 *Research for the Sociology of Education.* New York: Greenwood; 1986. p. 241–58.
27
28 669 27. Bassett AM, Brosnan C, Southgate E, Lempp H. The experiences of medical students
29
30 670 from First-in-Family (FiF) university backgrounds: a Bourdieusian perspective from one English
31
32 671 medical school. *Res in Post-Compulsory Educ.* 2019;24(4):331-55.
33
34
35 672 28. Hadinger MA. Underrepresented minorities in medical school admissions: a qualitative
36
37 673 study. *Teach and Learn in Med.* 2017;29(1):31-41.
38
39
40 674 29. Denicolo P, Long T, Bradley-Cole K. *Constructivist Approaches and Research Methods:*
41
42 675 *A Practical Guide to Exploring Personal Meanings.* London: SAGE Publications; 2016.
43
44
45 676 30. Kumar R. *Research methodology: a step-by-step guide for beginners.* 3rd ed. London:
46
47 677 SAGE; 2011.
48
49 678 31. Stegers-Jager K. Lessons learned from 15 years of non-grades-based selection for
50
51 679 medical school. *Med Educ.* 2018;52(1):86-95.
52
53
54
55
56
57
58
59
60

- 1
2
3 680 32. Varpio L, Ajjawi R, Monrouxe LV, O'Brien BC, Rees C. Shedding the cobra effect:
4
5 681 problematising thematic emergence, triangulation, saturation and member checking. *Med Educ.*
6
7 682 2017;51(1):40-50.
8
9
10 683 33. Barrett A, Kajamaa A, Johnston J. How to ... be reflexive when conducting qualitative
11
12 684 research. *Clin Teach.* 2020;17(1):9-12.
13
14 685 34. Mann S, Kelley L. Standing at the crossroads of modernist thought: Collins, Smith, and
15
16 686 the new feminist epistemologies. *Gender and Society.* 1997;11(4):391-408.
17
18 687 35. Kiger ME, Varpio L. Thematic analysis of qualitative data: AMEE Guide No. 131. *Med*
19
20 688 *Teach.* 2020:1-9.
21
22 689 36. Robb N, Dunkley L, Boynton P, Greenhalgh T. Looking for a better future: Identity
23
24 690 construction in socio-economically deprived 16-year olds considering a career in medicine. *Soc*
25
26 691 *Sci & Med.* 2007;65(4):738-54.
27
28 692 37. Bandura A. Self-efficacy mechanism in human agency. *American Psychologist.*
29
30 693 1982;37(2):122-47.
31
32 694 38. Barker C. Making sense of cultural studies: central problems and critical debates.
33
34 695 London: SAGE; 2002.
35
36 696 39. Bandura A. Self-efficacy: The foundation of agency. In: Perrig WJ, Grob A, editors.
37
38 697 *Control of Human Behavior, Mental Processes, and Consciousness: Essays in Honor of the 60th*
39
40 698 *Birthday of August Flammer.* New York, United States: Psychology Press; 2000. p. 25-39.
41
42 699 40. Crenshaw K. Mapping the margins: Intersectionality, identity politics, and violence
43
44 700 against women of color. *Stanford Law Review.* 1991;43(6):1241-99.
45
46 701 41. Wekker G. *White Innocence: Paradoxes of Colonialism and Race.* Durham, NC: Duke
47
48 702 University Press; 2016.
49
50
51
52
53
54
55
56
57
58
59
60

- 1
2
3 703 42. de Vries E, Kathard H, Müller A. Debate: Why should gender-affirming health care be
4
5 704 included in health science curricula? BMC Medical Education. 2020;20(1):51.
6
7
8 705 43. Cavanagh A, Jabbar A, Vanstone M. Particularizing 'Experiences': Naming whiteness in
9
10 706 the Academy. Med Educ. 2021;(preprint).
11
12 707 44. Lacombe-Duncan A, Logie CH, Persad Y, Leblanc G, Nation K, Kia H, et al.
13
14 708 Implementation and evaluation of the 'Transgender Education for Affirmative and Competent
15 709 HIV and Healthcare (TEACHH)' provider education pilot. BMC Medical Education.
16
17 710 2021;21(1):561.
18
19
20
21 711 45. Committee on the Elimination of Racial Discrimination. Concluding observations on the
22
23 712 nineteenth to twenty-first periodic reports of the Netherlands. United Nations. 2015.
24
25
26 713 46. Dutch Inspectorate of Education. The State of Education 2021 [De Staat van het
27
28 714 Onderwijs 2021]. Ministry of Education, Culture and Science,. 2021.
29
30
31 715 47. Seligman MEP, Abramson LY, Semmel A, von Baeyer C. Depressive attributional style.
32
33 716 Journal of Abnormal Psychology. 1979;88(3):242-7.
34
35 717 48. Talamantes E, Henderson MC, Fancher TL, Mullan F. Closing the gap: making medical
36
37 718 school admissions more equitable. N Engl J Med. 2019;380(9):803-5.
38
39
40 719 49. Cohen JJ, Gabriel BA, Terrell C. The case for diversity in the health care workforce.
41
42 720 Health Affairs. 2002;21(5):90-102.
43
44
45 721
46
47 722
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6 725 Figure 1. Six-step framework, adapted from Kiger and Varpio (2020)

7 726 Figure 2. This flowchart maps the core utterances of all transcripts, analyzing the links between
8 727 these utterances as expressed by the participants, and categorizing them as ‘facilitators’,
9 728 ‘barriers’, or ‘approaches to overcome barriers’ which are at play, and interact, in different
10 729 phases of the process to get ready for selection.

11 730 Note: Arrows have different patterns for readability but have the same meaning.

12 731 SNC = Social network connection
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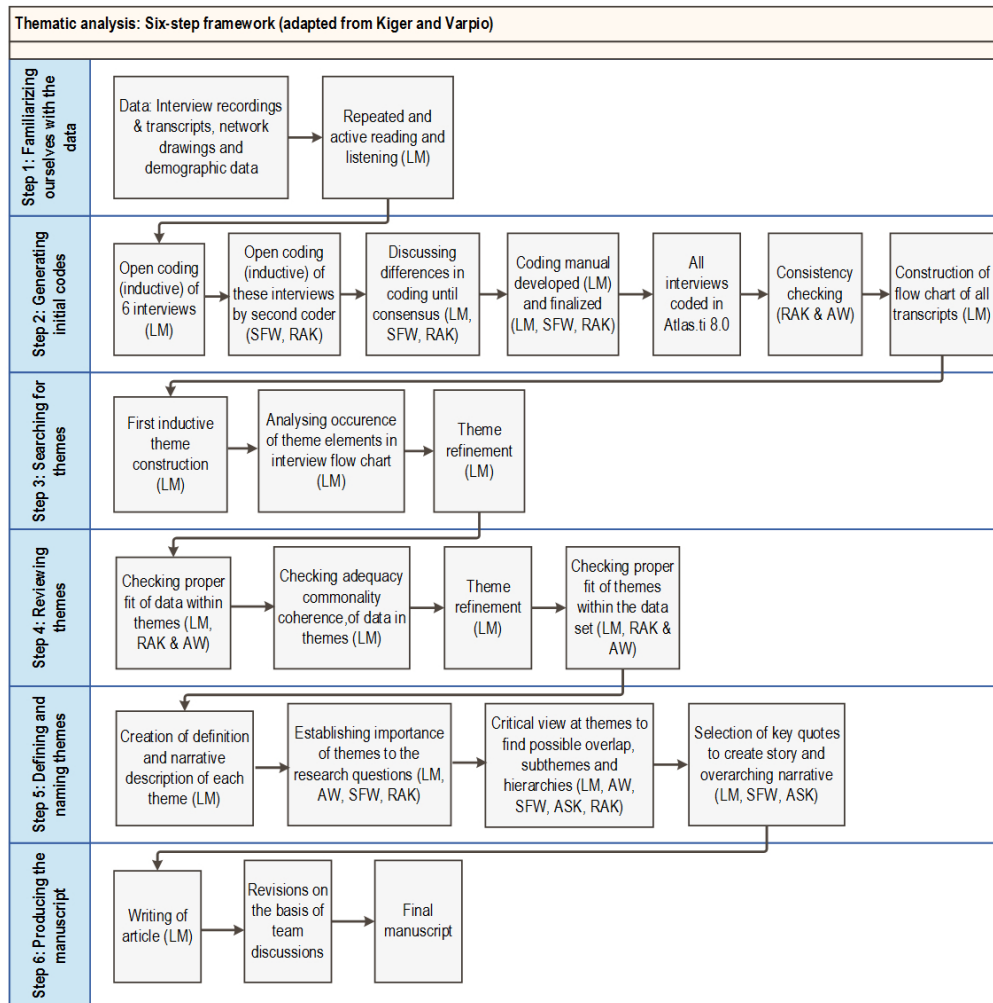


Figure 1. Six-step framework, adapted from Kiger and Varpio (2020)

735x737mm (39 x 39 DPI)

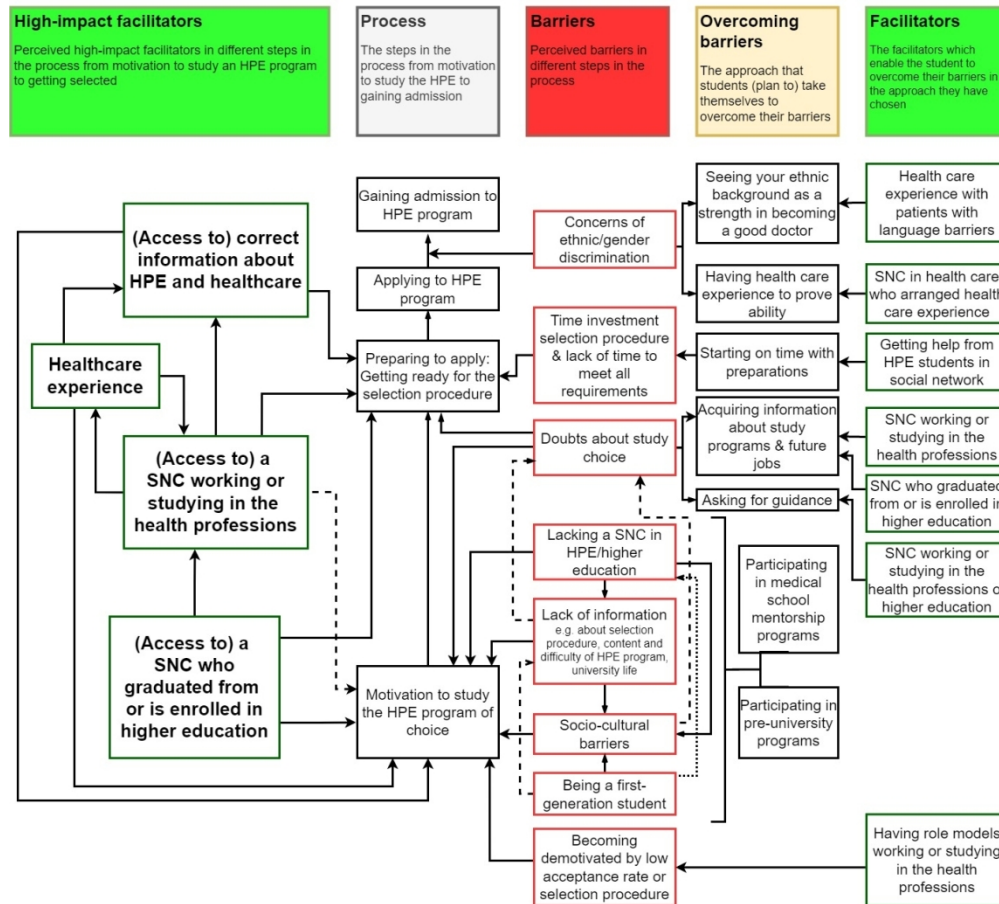


Figure 2

498x452mm (72 x 72 DPI)

Appendix 1: Topic list for interviews

1. Personal background characteristics
2. Reasons for interest in preferred HPE program
3. Opinion about selection procedures of HPE program
4. Expectations of what is necessary to be successful in the selection processes
5. Personal preparations for selection
6. What could help you to successfully apply for the preferred HPE program (personally, and what university, selection committee, government, others could do)
7. Expected chance of success in application
8. Possible barriers to be admitted for themselves and others
9. How student could gain access to things that may increase chances of getting admitted
10. Network drawing: which people in your life play a role in making a decision regarding your study choice?
11. Network drawing: which people in your life could help you to prepare for the selection procedure to gain admission to the HPE program of your choice?

Original study protocol

(attached as PDF)

Note to editors: The original study protocol is written in Dutch. We can provide an English translation if required.

Standards for Reporting Qualitative Research (SRQR)*

<http://www.equator-network.org/reporting-guidelines/srqr/>

Page/line no(s).

Title and abstract

<p>Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended</p>	p 1, l 1-2
<p>Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions</p>	p 2-3

Introduction

<p>Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement</p>	p 5-7
<p>Purpose or research question - Purpose of the study and specific objectives or questions</p>	p 7, l 157-160

Methods

<p>Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**</p>	p 10, l 214-222
<p>Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability</p>	p 9, l 198-209
<p>Context - Setting/site and salient contextual factors; rationale**</p>	p 8, l 177-183
<p>Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**</p>	p 8, l 167-183
<p>Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues</p>	p 30, l 574-580
<p>Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**</p>	p 7-9, l 165-197, p 10, l 220-222, Figure 1

1 2 3 4 5	Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	p 30, l 577-580, p 9, l 188-197, Appendix 1
6 7 8	Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	Table 1
9 10 11 12	Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	p 10, l 214-222 p 30, l 594-599 Figure 1
13 14 15 16	Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	p 10, l 214-222 Figure 1, p 30, l 594-599
17 18 19 20	Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	p 9, l 199-209

Results/findings

23 24 25 26	Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	p 11-23
27 28 29	Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	p 11-23, incl. Tables 3-5

Discussion

32 33 34 35 36 37	Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	p 24-29
38 39	Limitations - Trustworthiness and limitations of findings	p 28, l 532-549

Other

42 43 44	Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	p 30, l 588
45 46	Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	p 30, l 590-591

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

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**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
DOI: 10.1097/ACM.0000000000000388

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Keywords:	MEDICAL EDUCATION & TRAINING, EDUCATION & TRAINING (see Medical Education & Training), QUALITATIVE RESEARCH

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1 Influence of social networks in healthcare on preparation for selection 2 procedures of Health Professions Education: a Dutch interview study

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36

37 Abstract

38

39 Objectives

40 Health Professions Education (HPE) students are often unrepresentative of the populations they
41 will serve. The underrepresentation of nontraditional students is problematic, because diversity is
42 essential for promoting excellence in health education and care. This study aimed to understand
43 the perceptions of traditional and nontraditional students regarding facilitators and barriers in
44 preparing for HPE selection procedures, and to determine the role of social networks in their
45 decision-making and preparations to apply.

46 Methods

47 A qualitative study was conducted with twenty-six Dutch youth who were interested in
48 university-level HPE programs. Semi-structured interviews and sociograms were analysed using
49 thematic analysis, adopting a constructivist approach.

50 Results

51 Twenty-six high school students participated, with traditional and nontraditional backgrounds,
52 with and without social networks in healthcare and higher education. Two themes were
53 constructed. First, four high-impact facilitators helped to overcome barriers to apply and in
54 preparation for selection: access to a social network connection working or studying in
55 healthcare, to correct information, to healthcare experience, and to a social network connection
56 in higher education. Lack of information was the main barrier, while access to social network
57 connections in healthcare was the main facilitator to overcome this barrier. However, this access

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3 58 was unevenly distributed. Second, access alone is not enough: the need for agency to make
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5 59 use of available facilitators is also essential.
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8 60 **Conclusions**

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11 61 The themes are discussed using intersectionality. Traditional students with access to facilitators
12
13 62 develop their self-efficacy and agency within social structures that privilege them, whereas
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15 63 nontraditional students must develop those skills without such structures. Our findings provide
16
17 64 recommendations for the ways in which universities can remove barriers that cause unequal
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19 65 opportunities to prepare for the selection of HPE programs. Along with equitable admissions,
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21 66 these recommendations can help to achieve a more representative student population and
22
23 67 subsequently a better quality of health education and care.
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34 70 **Keywords:** selection; facilitators; barriers; social network analysis; unequal opportunities;
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36 71 access; qualitative study; thematic analysis; traditional students; nontraditional students.
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39 72 **Word count: 6932**

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76 Article summary

77 Strengths and limitations of this study

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

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98 **Background**

99 In many countries, the cohorts trained to become health professionals are unrepresentative of the
100 populations they serve. Health professions education (HPE) students who are admitted
101 disproportionately have highly educated and high-income parents who are more likely to work in
102 the medical field, and often belong to the ethnic majority¹⁻⁴. The underrepresentation of
103 nontraditional students is problematic, because diversity is essential in promoting excellence in
104 health education and care⁵⁻⁷. Here, we define nontraditional students as students whose parents
105 did not complete higher education and/or who have a migration background and belong to an
106 ethnic minority group; and traditional students as students with at least one parent who
107 completed higher education, who have no migration background or are not an ethnic minority⁸.

108
109 There is sufficient reason to assume that underrepresentation of nontraditional students is a
110 global phenomenon, as evidence suggests that opportunities to enrol in HPE programs are not
111 equally available to all eligible students^{9,10}. Those with nontraditional backgrounds face barriers
112 in selection procedures, and there are indications that they tend to shy away from applying to
113 HPE programs¹¹⁻¹⁴. The latter is called self-selection. Self-selection refers to students deciding to
114 apply or not based on the information they have¹⁵ and how they estimate their chance of success
115 based on actual and perceived barriers and facilitators. Known barriers include lack of
116 knowledge about the necessary preparations to increase chances of admission^{16,17}, or limited
117 access to suitable extracurricular activities¹⁸. Other barriers can be concerns about one's ability to
118 get admitted¹⁹, for example due to perceptions of lower chances of being selected compared to
119 other students^{20,21}, fear of not fitting in because of one's background²², or discouragement by
120 teachers²³. These barriers can relate to socio-economic status (SES)^{24,25} and its associated social

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3 121 capital (real or potential resources accessible through a person's networks) and cultural capital
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5 122 (here, the domestic transfer of values relating to education and academic achievement)²⁶. These
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8 123 factors may partially explain the underrepresentation of certain groups of nontraditional students
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10 124 in applicant pools¹.

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14 126 There are also indications that the networks of traditional and nontraditional students play an
15
16 127 important role in their decision to apply. For example, Southgate et al.¹⁸ found that all students,
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18 128 but especially nontraditional students, expressed a desire for 'hot knowledge' straight from the
19
20 129 source, to motivate their study choice and preparations for admission. Not knowing doctors who
21
22 130 served as a hot knowledge source was therefore an important barrier. The lack of a network in
23
24 131 the healthcare field was also found to be a major barrier^{20, 27, 28}. Without such a network, students
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26 132 experienced more difficulties in acquiring relevant work experience, preparing for the medical
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28 133 school application, and developing the confidence that the HPE program is the right study
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30 134 choice. These students can also become demotivated by the inequality they perceive¹⁴. However,
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32 135 the exact mechanisms behind *how* access to these social networks in healthcare can facilitate
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34 136 potential applicants, are not clear. Other studies employing qualitative social network analyses in
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36 137 HPE have shown the importance of social networks of medical students in how they transition
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38 138 from pre-clinical to clinical training, and their networks' role in accessing opportunities to
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40 139 learn²⁹; the influence of social networks on academic performance in medical school³⁰, and how
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42 140 (not) having family members working in the medical field results in medical students being
43
44 141 either 'insiders' versus 'social newcomers' to medicine³¹. This study aimed to explore how social
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46 142 networks can influence high school students in the pre-application stages of HPE.
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3 144 In many countries there is broad attention to potential inequality of opportunity in access to
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5 145 higher education in general, and HPE programmes in particular. In The Netherlands, there are
6
7 146 also strong indications that HPE students are unrepresentative for the population as a whole, and
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9 147 concerns exist that the change from lottery admission to selection has negatively influenced
10
11 148 student diversity and equitable admissions²¹. For example, students with a so-called ‘non-
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13 149 Western’ migration background have lower chances of being selected⁴. In spite of men making
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15 150 up 50% of the student population that is eligible to apply for HPE, they make up only about 30%
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17 151 of the HPE student population³². However, international research on the detailed demographics
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19 152 of potentially eligible student and applicant pools of HPE programs, and how exactly the factors
20
21 153 which influence self-selection play a role, is scarce²¹. Wouters et al.¹⁵ provided an account of
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23 154 factors that influence Dutch potential applicants’ motivation to apply for medicine. However, it
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25 155 is not sufficiently known to what extent this process differs between traditional and
26
27 156 nontraditional students, nor how people in their networks influence their decision-making. These
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29 157 potential differences may play an important role in understanding the underrepresentation of
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31 158 certain sociodemographic groups in HPE programmes. This knowledge is crucial for universities
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33 159 to develop outreach programmes or take away possible barriers, to increase the diversity of the
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35 160 HPE applicant pool. Therefore, this article aimed to answer the following research questions: 1)
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37 161 What are the perceptions of high school students of different backgrounds regarding facilitators
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39 162 and barriers in getting ready for selection and gaining admission to an HPE program? And 2)
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41 163 How do people in the social networks of these students influence their decision-making to apply
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43 164 and their preparations for the selection procedure? Our objective is to explore, rather than
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45 165 compare, what their perceptions and social networks are, and how these interact.
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166 Method

167 Design, procedure and setting

168 We designed a cross-sectional study, adopting a constructivistic approach³³ and conducted semi-
169 structured qualitative interviews with a diverse group of traditional and nontraditional high
170 school students aged 16 years and older, to gain insight into various facilitators and barriers.

171 One-on-one interviews enabled an in-depth exploration of how participants experience and make
172 sense of their own unique world³³. Before the start of the official interviews, we organised
173 practice interviews with medical students. Their feedback yielded interview questions that were
174 more sensitive to the lived experiences of potential participants. For example, rather than asking
175 them about their mother and father (which we did in the practice interviews), we changed our
176 wording to the more inclusive phrase 'parent/caretaker'.

177 Both purposive and snowball sampling³⁴ were used to recruit participants who were eligible for
178 university-level HPE programmes on the basis of their pre-university high school track. We
179 focused on students who were interested in studying Medicine, Clinical Technology, Pharmacy,
180 Dentistry and Biomedical Sciences, to capture a wider range of potential HPE applicants who
181 were in the process of getting ready for one or more HPE selection procedure(s) which have
182 similar eligibility requirements. In the Netherlands, all HPE programs design their own selection
183 procedure and make use of a limited arsenal of selection instruments, such as previous academic
184 achievement, work samples, admission exams, or assessment of extracurricular activities³⁵.

185 Letters and recruitment posters were sent by email and regular mail to 76 schools in 6 provinces
186 of the Netherlands, because we were interested in a diversity of backgrounds and experiences
187 (purposive sampling). Participants were also asked if they knew other potential participants

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3 188 (snowball sampling). They were interviewed by LM at or near their own high school, so they
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5 189 would feel at ease in a familiar environment. The interviewer had no relationship to the
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8 190 participants and was not involved in any selection procedure. We decided that data collection
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10 191 would be concluded once data sufficiency was achieved, meaning once two subsequent
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12 192 interviews did not yield new insights into the research topics³⁶. Interviews lasted for 30–96
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15 193 minutes.

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18 194 At the start of the interview, participants filled out a form asking about their gender, parents'
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20 195 occupations, and ethnic background (all free text) and highest parental education levels (multiple
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22 196 choice). Parental education levels and occupations were used to determine first-generation
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24 197 student status and whether participants had a parental social network in healthcare.

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27 198 The first part of the interview focused on the opinions about and expectations of the selection
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29 199 procedures, their personal preparation, and their current and potential facilitators and barriers
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31 200 (see Appendix 1 for topic list). The second part consisted of the student drawing two networks
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33 201 by hand: one of the people who play a role in making their study choice, the other of the people
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35 202 in their network who can help them prepare for the selection procedure. Each individual person
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37 203 in their network is referred to as an *alter*²⁹. Participants were instructed to start with themselves
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39 204 as the focal point, drawing lines between them and their alters. The participants thereby created
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41 205 what is called a participant-generated 'ego network sociogram'.³⁷ The connections between
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43 206 individuals in the sociograms are called *ties*²⁹. While drawing, participants were asked how these
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45 207 people played a role in both processes, and in what way they related to these persons. As we
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47 208 aimed to focus on the meaning of the relationships between the student and their network
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49 209 connections, rather than statistically measure them, we chose the approach of qualitative social
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51 210 network analysis³⁷. The sociograms were used during the interview for stimulated recall, and
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3 211 participants were able to edit and refine their sociograms while the interviewer continued to
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5 212 probe them. We placed no limits on the number of ties that students could draw. During data
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7 213 analysis, the sociograms enabled the research team to gain insight into the different (types of)
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9 214 networks of participants, and which type of ties (e.g. connected through family, school,
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11 215 friendship, work, religious organization, etc.) played facilitating roles in the process of choosing
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13 216 an HPE program and preparing for selection. By analysing transcripts next to the two sociograms
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15 217 of the respondent, we aimed to reveal insights into hidden relational data which would not be
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17 218 found on the basis of either method alone³⁷. For example, we studied whether participants named
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19 219 alters in the transcript, which were associated with a facilitator or barrier, or who played a role in
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21 220 getting access to a facilitator. Then, we looked at whether they had named this alter in one of
22
23 221 their sociograms, and if so, in which context. We also studied whether these alters were closely
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25 222 connected (e.g. parents, siblings) or were more distant to the respondent (e.g. their dentist or
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27 223 doctor).

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29 224 We focused on each student's own social networks, since we assumed that a) people in one's
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31 225 network may be inclined to help a high school student make study choices and prepare for a
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33 226 selection procedure (like parents who help their children, and older siblings who help their
34
35 227 younger siblings), and b) since these people are easily accessible to young high school students,
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37 228 we assumed they would be the easiest go-to persons for students requiring help and resources.
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49 230 Ethical considerations

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51 231 The Ethics Committee at Amsterdam UMC, location VUmc approved this study (file no.
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53 232 2019.274). Participation was voluntary and the participants were informed that they could
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233 withdraw from the study at any point in time. Participants gave written, informed consent. In the
234 Netherlands, 16-year-olds do not need parental consent to participate in research. Interviews
235 were audio-recorded and transcribed. Data were pseudonymised and only [A1] had access to
236 traceable data. Participants were given a €10 gift card each.

237 **Research team**

238 The team consisted of researchers with various professional backgrounds (in sociology,
239 psychology, educational science, pharmacy, and medicine), who share a mutual interest in the
240 subject of equitable opportunities in HPE. [A1], [A2], [A4], [A5] and [A6] were first-generation
241 students. [A3] was a traditional student. [A7] has an ethnic minority background. A7, who had
242 a limited social network in HPE at the start of medical school, contributed her understanding of
243 the lived experiences of the non-traditional students with limited networks. The diversity of our
244 backgrounds encouraged reflexivity³⁸ and critical dialogue, ensured we interpreted the data using
245 different theoretical and conceptual lenses, and resulted in proactively looking for potential blind
246 spots. For example, we had a discussion about the potential role of the interviewer's identity
247 (Author 1) in interviewing participants with a (visibly or invisibly) different background. This
248 discussion led us to organise practice interviews with medical students, as mentioned in the
249 previous section

250 **Patient and Public Involvement**

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

253 Data analysis

254 We used a social constructivist paradigm for our data analysis, assuming that there are multiple
255 realities, as each student holds a unique world perspective. This perspective is subjective and
256 based on their individual social location and the social conditions under which their knowledge
257 was formed³⁹. Therefore, we did not start with a specific theory to interpret our results, nor
258 sensitizing concepts, but inductively interpreted the meanings of participants' responses³⁴ to
259 construct our themes using thematic analysis. We selected this method as it is a useful tool to
260 seek understanding of the experiences, thoughts and behaviours of our participants⁴⁰. Figure 1
261 shows the steps taken in the data analysis process by the different members of the research team,
262 based on the six-step framework described by Kiger and Varpio⁴⁰.

263 [Figure 1]

264 Additionally, a flowchart portraying participants' core utterances was made to enable a deeper
265 understanding of *how* access to (perceived) facilitators helped them to overcome their
266 (perceived) barriers in the process of developing their motivation to study in an HPE program,
267 and in preparing for the selection procedure. We made this flowchart in order to discover
268 potential patterns occurring throughout the different interview transcripts, and to visualize the
269 connections between facilitators and barriers, with the aim to formulate a more complete answer
270 to research question 2.

272

273 Results

274 Participants

275 We interviewed 26 high school students from 14 schools in 5 cities and 1 small town, between
 276 June 2019 and March 2020. They were enrolled in the 4th or 5th (penultimate) year of the science-
 277 oriented pre-university tracks, which give access to HPE programs. The demographic
 278 composition of the sample is summarised in Table 1. Participants with a migration background
 279 belong to the first or second generation. We did not observe differences on the basis of preferred
 280 HPE programmes.

281 **Table 1: Participants' background characteristics**

Migration background	
No migration background	12
Migration background & ethnic minority	11
Migration background & 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 traditional student status & parental network in healthcare	
Traditional student* & parental network in healthcare	8
Traditional student* & no parental network in healthcare	4
Non-traditional student** & parental network in healthcare	4
Non-traditional student** & no parental network in healthcare	10
Preferred HPE program (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	

283
 284 There were numerous factors that participants experienced as facilitating or presenting a barrier
 285 to pursuing and entering an HPE program (Table 2). These factors had an influence on their
 286 motivation to pursue an HPE program. We developed two main themes based on the interviews,
 287 sociograms and the flowchart (Figure 2). These themes relate to 1) students' unequal access to
 288 high-impact facilitators, and 2) students' mindset and responsibility to use available facilitators,
 289 to actively create opportunities for oneself and to overcome barriers. As the perceived facilitators
 290 and barriers were very intertwined with participants' networks, the themes relate to both research
 291 questions simultaneously.

292 **Table 2: Factors students experienced as facilitating or presenting a barrier to**
 293 **pursuing an HPE program**

Facilitators	Barriers
Having a social network connection in the medical field	Doubts about study choice (e.g. due to length or difficulty of study, negative stories, feelings of inaptitude)
Having role models in the medical field	Lack of information (e.g. about the content or difficulty of the HPE program, 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 they 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 program
The desire to help people	Socio-cultural 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 program	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 specialize in a particular health professions field	Lack of time to attend Student-for-a-Day/Open Days
Being a patient	Meeting people who failed or regret HPE study choice
Medical master classes at university	
Being family of a (deceased) patient	
Participation in extracurricular programs relating to HPE programs	
Medical TV series	

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3 295 Theme 1: Access to high-impact facilitators is perceived as very beneficial for
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6 296 preparation, but this access is distributed unequally
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8 297 The high school students in our sample were interested in different HPE programmes at different
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10 298 universities and thus had different selection procedures to prepare for. In the process of getting
11
12 299 ready for these respective procedures, participants perceived a great number of facilitators (Table
13
14 300 2). We found that four of those had a high impact, because not only were they perceived as
15
16 301 helpful in preparing to apply or in having a higher chance of being admitted, but also because
17
18 302 they provided access to other facilitators. The first and most important one was **access to a social**
19
20 303 **network connection working or studying in the medical field**, such as parents, siblings, other
21
22 304 family members or (family of) friends. These types of ties were the most common connections,
23
24 305 but alters could also be participants' doctors, dentists, employers, teachers or deans. These
25
26 306 people were role models, aided in making a study choice, and/or were expected to assist in
27
28 307 preparing for the selection procedure. For example, Participant 7 (interested in Medicine, man,
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30 308 one parent completed higher education, both parents in healthcare, no migration background)
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32 309 explained:
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39 310 *"I try broadening my knowledge in the area of anatomy, which is going quite well since my sister*
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41 311 *is studying for her Nursing degree. So she has to know all sorts of things about anatomy. And my*
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43 312 *mom is also doing different things for her Personal Care Assistant degree, so I also learn from*
44
45 313 *that. So that gives me an advantage compared to other people."*
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49 314 Network connections in the medical field also helped participants to get **access to correct and**
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51 315 **valuable information related to health professions education and healthcare**, which was a
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53 316 second important facilitator. This included information about selection, first-hand knowledge of
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55 317 the healthcare sector, inspiring or informative stories, or access to medical literature. It improved
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3 318 participants' motivation, and strengthened their conviction that the HPE programme was the
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5 319 right study choice. It assisted in choosing a strategic approach to the selection procedure, as they
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8 320 knew what the selection requirements were. Participant 16 (interested in Medicine or Biomedical
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10 321 Sciences, woman, higher-educated parents, no parents in healthcare, migration background, not
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12 322 an ethnic minority) got in contact with a care home physician through a friend's father (also a
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14 323 physician):

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16
17 324 *"He helped me because I asked him very much, not about selection but about the study itself (...)*
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19 325 *And also, yeah just about what the study contains, content-wise. And that also helped me to get*
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21 326 *even more enthusiastic about the study program. So that strengthened it, so to say".*
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25 327 Lacking access to a social network in the medical field often resulted in the barrier of lacking
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27 328 correct or useful information. Lack of information led some participants to have doubts about
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29 329 their study choice or expected chance of successful admission, sometimes resulting in feelings of
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31 330 being insufficiently prepared. Although certain information can also be gained through other
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33 331 avenues than a social network in healthcare, such as by attending Open Days, participants
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35 332 emphasized that such avenues mainly provide general information, not the 'insider' information
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37 333 they were looking for.
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42 334 The third important facilitator was **healthcare experience**, e.g., through volunteering,
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44 335 shadowing a doctor, an internship or a paid job. A social network in healthcare made it easier to
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46 336 gain such experience, but some participants found ways without a network. Participants
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48 337 described how healthcare experience strengthened their motivation, and supported overcoming
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50 338 psychological barriers, such as study choice doubts, fear of failure, pressure or stress regarding
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52 339 competition with others. It also provided them with access to other facilitators: they got a chance
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54 340 to build their CV (which helped build their confidence in successful admission); they had access
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3 341 to more information about the medical field, the selection procedure, the content of the HPE
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5 342 programme, and future career options; and they gained valuable network connections.
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8 343 Furthermore, it led to inspiring patient encounters, which enhanced motivation. This made
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10 344 healthcare experience more valuable than simply a CV-building activity to increase their chances
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12 345 of admission. For example, Participant 17 (interested in Medicine or Medical Sciences, woman,
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14 346 no parent completed higher education, one parent in healthcare as care advisor, migration
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17 347 background, ethnic minority) explained:

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20 348 *“By shadowing doctors I already learn quite a lot. Because every time you walk there, then you*
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22 349 *hear so many terms that you really don't understand, and especially in the beginning I really*
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24 350 *didn't understand anything. And every time you hear something, you can look it all up, or ask,*
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27 351 *they just like it if you ask questions. So I find that a nice way to learn too. I have also seen how*
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29 352 *you need to suture, that was very cool (...) I shadowed a surgeon and was allowed to see the*
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31 353 *wound, and he said: ‘do you see that hamstring there?’ and I said: ‘which one?’ and he said*
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33 354 *‘well, put on a glove and come here’. (...) I really liked it, yes, because I was allowed to feel it*
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35 355 *and that was so cool”.*

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39 356 For more details on the facilitating effects of having a social network connection in the
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41 357 healthcare sector, see Table 3 and Figure 2.

42 43 44 45 358 **[Figure 2]**

46 359
47 360 The fourth important facilitator was **having family members or other social network**
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49 361 **connections who graduated from or are currently enrolled in higher education.** Several
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51 362 participants described how parents or siblings could help them in their decision-making process
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54 363 to pursue a university-level HPE program, and how they were able to assist them better thanks to

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3 364 their knowledge of navigating the university system or the HPE selection procedure. For
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5 365 example, Participant 23 (interested in Pharmacy or Pharmaceutical Sciences, woman, higher-
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7 366 educated parents, no parents in healthcare, migration background, ethnic minority) explained
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10 367 how she acquired information about study programmes:

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13 368 *“I mainly read a lot about the universities, about the study programmes. And really read in*
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15 369 *detail about what they expect, what they want from you. But sometimes it was a bit too much*
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17 370 *information and then I didn’t understand everything they meant, so then I go after that some*
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19 371 *more (...) And I know a lot of acquaintances, who all studied [at university] as well. So usually,*
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21 372 *when I know that someone studied something in particular, then I ask: okay, and what do you*
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23 373 *think of it?”*

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27 374 Participants who did not have family members with this experience, sometimes searched for this
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29 375 type of assistance in others. Lacking access to this facilitator was described explicitly by a few
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31 376 participants as a barrier. For example, Participant 4 (interested in Medicine, woman, no parent
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33 377 completed higher education, one parent in healthcare (care assistant), no migration background),
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35 378 described:

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39 379 *“Maybe other future medicine students have parents who also have their education level or*
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41 380 *completed the same study, and I don’t have that. Also not in the wider family (...). For example,*
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43 381 *their parents could say like this is how a selection procedure would go, because maybe they*
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45 382 *already did it, or another one, that maybe they could give advice on how that goes and how you*
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47 383 *should do that. But I have to do that myself.”*

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51 384 In summary, access to a social network connection working or studying in the medical field, and
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53 385 a social network connection in higher education were important in gaining access to a range of
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386 other facilitators, such as access to correct information and healthcare experience. Access to
 387 valuable social network connections could be relatively easy and less hierarchical in nature, such
 388 as parents, siblings, other family members or (family of) friends. These types of ties were the
 389 most common connections, showing that network alters were often having a certain degree of
 390 similarity to the participants. However, some alters were less similar and had a more hierarchical
 391 relationship to the participant, such as participants' personal doctors, employers, teachers or
 392 deans.

393 **Table 3: Quotes of theme 1 on the facilitating effects of a social network in**
 394 **healthcare**

Access to correct and valuable information	
Quotes	Participants' background characteristics and preferred HPE program
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, he 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 6 th [final 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

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Our findings indicated that access to facilitators is distributed unequally. For example,

398 participation in preparatory and mentoring programs that are offered by universities helped some

399 participants to overcome the barriers of a lack of information or a social network. However, pre-

400 university programs were not accessible to all interested participants due to limited availability

401 of places, a high grade point average (GPA) requirement, and/or high costs. This was perceived

402 as a barrier by several participants.

403 Some participants explicitly described the lack of access to a certain facilitator (e.g., higher-

404 educated parents, a social network in healthcare) as a barrier. However, for most it remained

405 implicit: when they described the barriers they perceived (e.g., not knowing enough about

406 possible career options after graduating from an HPE program), they did not explicitly say that

407 these barriers were caused by a lack of access to e.g., healthcare experience. On the other hand,

408 participants with more resources, facilitators and useful social network connections at their

409 disposal recognized their advantages over their peers who lacked them and judged this as

410 unequal or unfair. This perceived inequality or unfairness was a recurring theme, and it related to

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3 411 different elements of the preparation process: GPA, CV-building, pre-university programs, paid
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5 412 entrance exam trainings, parental backgrounds, and access to university or an HPE study in
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7 413 general. For example, Participant 16 (preferred HPE program: Medicine or Biomedical Sciences,
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9 414 woman, higher-educated parents, no parent in healthcare, migration background, not an ethnic
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11 415 minority) argued:

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15 416 *“I know entire programs exist that really cost 300 Euros, that help you with your admission. But*
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17 417 *I don’t know, I feel that’s a bit unfair. Because suppose you don’t have a lot of money, then you*
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19 418 *cannot join that. That because of that, people with more money get in more easily. So I don’t feel*
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21 419 *like joining that (...) I would be able to pay, and my parents could also pay for it. But it’s more*
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23 420 *out of principle that that I don’t want to participate in that.”*

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27 421 Participant 1 (preferred HPE program: Medicine, woman, higher-educated parents, one parent in
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29 422 healthcare (as caregiver), no migration background) told the story of a classmate with highly
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31 423 educated refugee parents, who were doctors in their home country but were not allowed to
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33 424 practice medicine in The Netherlands. She argued that, if they would have been able to be
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35 425 practicing physicians here, their daughter would have more contacts in the medical field. When
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37 426 asked what difference this could have made, she answered:

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42 427 *“I don’t know if that directly influences whether their daughter gets admitted to the study*
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44 428 *program or not, but I think that unconsciously it does matter somehow. Because if her parents*
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46 429 *are part of that network, they would rather see their child getting admitted. Then they would do*
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48 430 *more to achieve that, or there would be other people who give them advice which their daughter*
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50 431 *could use. Or yeah, if you are in that world, then it is just easier to stay in there (...) It always*
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52 432 *goes a bit more naturally if you are already in that world. Maybe it would also help for your*
53
54 433 *motivation.”*

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

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

440 **Table 4: Quotes on unequal opportunities to prepare for selection**

Unequal opportunities related to parental education or profession	
Quotes	Participants' background characteristics and preferred HPE program
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 Science, 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	

441	9: "I am willing to do a lot to get through it. But it's not very honest, 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		
442	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

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444 Theme 2: Access alone is not enough: the need for agency to make use of available 445 facilitators, to create opportunities and to overcome barriers

446 Once participants decided to pursue an HPE program, they entered the phase of preparing to
447 apply. Many participants stressed the importance of taking one's own responsibility and having
448 the right mindset or attitude in this regard to adequately prepare oneself. For example, Participant
449 1 argued:

450 *"I think that if I put my mind to medicine, then I have a large chance of success. I do have... yes,*
451 *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*
452 *know that in principle I should be able to do it, so I think that it's really up to yourself. Do I want*
453 *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*
454 *to be able to look back later and think: 'Yes, even if I had wanted to do more, I couldn't even*
455 *have done it'. (...) But I do think it will be difficult, so to say, it's not like you just get in easily, so*
456 *I definitely would have to do my best."*

457 Table 5 shows more quotes related to this theme.

458 **Table 5: Quotes of theme 2 on mindset and taking responsibility**

Taking your own responsibility	
Quotes	Participants' background characteristics and preferred HPE program
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

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3 461 Although participants perceived numerous barriers, many had already developed approaches to
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5 462 overcome these. For example, several participants with a migration background expressed
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7 463 having a language barrier when writing a motivation letter or drafting their resume. Some
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10 464 intentionally read more books and used a dictionary to improve their fluency. Others planned to
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12 465 ask their Dutch language teacher for help. To counter fear of failure, participants used practice
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14 466 exams. Finally, they gathered as much information as possible about HPE programs to counter
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17 467 study choice doubts.

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20 468 Access to (high-impact) facilitators was often useful to develop approaches to overcome barriers.
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22 469 For example, healthcare experience helped to overcome perceived barriers in unexpected ways.
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24 470 Participant 17 for instance (nontraditional student, no parent completed higher education, one
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26 471 parent in healthcare sector, migration background, ethnic minority) had the highest number of
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28 472 years of healthcare experience of all participants. Occasionally, she served as interpreter when no
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30 473 official one was available, when dealing with hospital patients who could only speak Turkish.
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32 474 She argued that speaking an additional language would enable her as a doctor to help these
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34 475 patients better. Later in the interview, when discussing barriers to selection, and ethnic
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36 476 discrimination happening at her school and in society, she said that ethnic discrimination was a
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38 477 reason to work even harder to get admitted, as she had seen all those patients with a language
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40 478 barrier. This means that access to (high-impact) facilitators such as healthcare experience can
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42 479 mitigate possible perceived barriers (such as discrimination) which may at first have seemed
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45 480 unrelated.

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50 481 However, some participants did little or nothing to overcome their barriers, and predominantly
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52 482 suggested ways in which others (e.g., universities or hospitals) could help them overcome these
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54 483 barriers. In a number of cases, those others were already doing what the student suggested (e.g.,

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3 484 organising Open Days or Student-for-a-Day events) but paradoxically, these participants did not
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5 485 make use of these facilitators. Some participants also had facilitators close at hand without
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7 486 making use of them. For example, participant 26 (traditional student, woman, higher-educated
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9 487 parents, one medical parent) had access to several physicians through whom she could gain
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11 488 healthcare experience or information, but she had not yet done so. Nor had she taken other action
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13 489 to improve her admission chances. Nevertheless, she believed she had a good chance, as she
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15 490 perceived the program to be “destined” for her. This shows a difference in mindset with regard to
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17 491 creating opportunities for oneself and building confidence, compared to other participants who
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19 492 emphasized that only if you work hard enough, you have a chance to be admitted.
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25 493 Discussion

26 494 This study aimed to gain understanding of the perceived facilitators, barriers and the role of
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28 495 social networks for traditional and nontraditional students, and how these influence the decision
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30 496 to apply to an HPE program. We found four high-impact facilitators to be beneficial in
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32 497 overcoming barriers to apply and in preparation for selection: access to a social network
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34 498 connection working or studying in the medical field, access to correct information, access to
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36 499 healthcare experience, and access to a social network connection in higher education. Lack of
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38 500 information was the main barrier, while access to social network connections in healthcare was
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40 501 the main facilitator to overcome this barrier. Access to facilitators is distributed unequally, as in
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42 502 our sample, traditional students were more likely to have a parental network in healthcare..
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44 503 However, having access alone is not enough: one needs to make use of available facilitators, to
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46 504 create opportunities and to overcome barriers.
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52 505 Our results confirm many of the known barriers^{20, 27, 28, 41}. They add to the literature by
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54 506 demonstrating in detail the multiple ways in which participants (plan to) overcome them, and
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3 507 *how* having a social network in HPE or the health professions aids them in this pursuit: for
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5 508 example, these persons aided in making a well-informed study choice, assisted in preparing for
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7 509 the selection procedure, helped to get access to correct and valuable information related to health
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9 510 professions education and/or healthcare careers, served as role models, and, most importantly,
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11 511 helped to gain access to valuable healthcare experience, e.g., volunteering, an internship or a
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13 512 paid job.
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17 513 While we used a constructivistic approach to interpret our findings and construct the main
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19 514 themes using thematic analysis, we need to discuss their meaning using theoretical lenses and
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21 515 concepts which focus not only on the micro level of the individual, but also on the macro level of
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23 516 social structures and their affordances. On the micro level, the psychological concepts of self-
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25 517 efficacy and agency come into play. Self-efficacy refers to what someone believes about their
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27 518 ability to succeed in specific situations or to accomplish certain tasks⁴². In this case, it concerns a
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29 519 student's belief in their ability to accomplish tasks in preparing for the selection procedure,
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31 520 and/or to succeed in the selection procedure. Agency refers to someone's capacity to act and to
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33 521 make their choices independently⁴³. Self-efficacy is the foundation of agency, because to express
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35 522 agency means one believes in one's power to make something happen⁴⁴. In this study, agency
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37 523 relates to whether the student actively looks for (perceived) useful information, acts upon
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39 524 knowledge about useful preparatory activities, makes use of social network connections they
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41 525 have in healthcare, and decides when and where to ask for support.
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48 526 However, on the macro level, self-efficacy and agency may be influenced by the social structures
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50 527 in which the student finds oneself and the relative position the student occupies within these
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52 528 social structures. Here, the theory of intersectionality⁴⁵ helps to better understand our results.
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54 529 Intersectionality theory holds that identities are multi-layered and that on each layer of one's
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3 530 identity, a person can either occupy a position which is privileged and seen as ‘the norm’ in the
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5 531 context of a particular society, or oppressed and seen as the non-normative ‘Other’⁴⁵⁻⁴⁷. It thus
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7 532 locates the individual on multiple axes of privilege/oppression that relate to social structures, for
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9 533 example relating to gender (sexism), ethnic background (racism), or socio-economic class
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11 534 (classism)^{45, 48, 49}. These social structures may influence an individual’s development of agency
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13 535 and self-efficacy: traditional students develop those within social structures which privilege them
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15 536 (as they belong to the ethnic majority and have higher-educated parents), whereas nontraditional
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17 537 students must develop agency and self-efficacy in a context of social structures that may not
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19 538 privilege them (e.g., as they are ethnic minorities and/or have a lower SES background).

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24 539 It is therefore important to situate our findings and interpret both themes in a wider societal
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26 540 context where social, economic and educational inequalities remain persistent^{46, 50, 51}. Many
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28 541 participants, both traditional and nontraditional, emphasized that their own effort and mindset are
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30 542 essential to get into their desired program. They developed their own approach for overcoming
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32 543 obstacles, in which they proactively took action or knew when to ask the right person for help.
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34 544 However, a deeper analysis shows that these participants often already had immediate access to
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36 545 facilitators which presented them with such opportunities. The most important one was an easily
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38 546 accessible social network in healthcare, which provided informal and direct or indirect access to
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40 547 correct information, healthcare experience, and other facilitators. This suggests that the easier
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42 548 one’s access to a social network in healthcare is, the more natural it is to develop the required
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44 549 self-efficacy and agency to adequately and effectively prepare for the selection procedure.
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46 550 Therefore, access to a social network in healthcare seems to have a positive multiplier effect in
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48 551 all aspects of getting ready for selection. It is possible that since medicine, dentistry and
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50 552 pharmacy are disproportionately populated by students and professionals from similar high SES
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3 553 backgrounds^{5, 32, 52}, high school students from high SES backgrounds may structurally be more
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5 554 likely to know the right alters to easily access a social network in healthcare. Conversely, not
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8 555 having such social network connections may result in a self-selection process for eligible
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10 556 students who decide to refrain from applying, because they neither had the access nor the
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12 557 opportunity to use this facilitator in the development of their self-efficacy and agency.

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15 558 The exceptions in our study are a few traditional students with access to a social network in
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17 559 healthcare who did not seem to make a sustained effort to prepare for the selection procedure, yet
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19 560 believed they would be admitted because they really wanted it or were “destined” to do it.
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21 561 Nontraditional students did not demonstrate such a belief. The number of traditional students
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23 562 who were confident that they would get in despite their lack of effort in preparations was small,
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25 563 and we do not know why they held this belief. We hypothesize that the discourse that ‘you can
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27 564 be anything you want to be’ is easier to adopt when one belongs to higher SES families without a
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29 565 migration background, owing to fewer structural and institutional barriers to be what you want to
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31 566 be.

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36 567 Other exceptions are a few nontraditional students of disadvantaged backgrounds who perceived
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38 568 barriers but had not thought of ways to overcome them and did not know who or what could help
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40 569 them. This could suggest a ‘learned helplessness’⁵³, possibly stemming from the intersections of
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42 570 disadvantage at which they find themselves⁴⁵. They lacked the necessary positive experiences
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44 571 required to build a strong sense of self-efficacy and agency. While other studies^{20, 28} found deep
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46 572 uncertainty in such nontraditional students when comparing themselves with traditional students,
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48 573 that seemed less pronounced in the present study. This may be because these participants often
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50 574 thought that other potential applicants had those same barriers as well. This finding was not
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52 575 unexpected, due to the known degree of (*de facto*) segregation in Dutch education based on
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3 576 SES⁵¹. Low-SES participants were thus likely surrounded by peers in similar circumstances and
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5 577 were not aware of the numerous facilitators that higher-SES participants might be able to draw
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8 578 upon. However, we had only a few participants in this group, therefore we cannot be certain if
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10 579 this hypothesis is true.

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13 580 Our research brought to light a salient finding not reported elsewhere: participants who had
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15 581 access to numerous facilitators, acknowledged their privileges over their peers without such
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17 582 access. They often labelled this as unfair or unjust. They also argued that certain selection
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19 583 instruments, on which they expected to have an advantage due to their privileges, had little to do
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21 584 with becoming a good doctor. To our knowledge, this solidarity has not been found earlier in
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23 585 research on selection for HPE programs. A retrospective multi-cohort study by our team³² has
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25 586 reported that applicants to HPE programs have significantly higher odds of admission if they
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27 587 have one or two parents who were registered healthcare professionals, if their parents belonged
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29 588 to the wealthiest 10% of the population, if they were female, and if they had no migration
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31 589 background. This supports many of the findings in the present manuscript. It also indicates that
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33 590 the participants who recognized their access to certain facilitators as privileges (which were
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35 591 giving them an advantage in preparing for selection) were correct in their analysis of the
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37 592 structural inequities in getting ready for HPE selection procedures.

38 39 40 41 42 43 593 **Strengths and limitations**

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46 594 A strength of this study is the focus on *how* the social networks of students influence their
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48 595 decision-making process, and *how* exactly these networks provide access to facilitators and result
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50 596 in unequal opportunities, both in practical terms and in developing the self-efficacy and agency
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52 597 that is needed to successfully prepare for the competitive selection procedures of HPE programs.
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3 598 All participants of this study attended school in relatively urban areas in the Netherlands because
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5 599 we had difficulty recruiting participants from rural areas. We had only a few participants with an
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7 600 estimated low SES, and no participants with parents on social welfare. The traditional students in
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9 601 our sample were more likely to have parents who worked in the healthcare sector. This may have
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11 602 influenced our results. For example, access to healthcare experience may be more difficult for
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13 603 students in rural areas, where the distance to healthcare institutions is greater than in urban areas.
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15 604 This could mean that the major facilitator in developing the motivation and confidence to apply
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17 605 to an HPE program, is less within the reach of potential rural applicants. To test that hypothesis,
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19 606 further studies could purposively sample these groups.
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24 607 Another potential limitation is that interviewer [A1] belongs to the Dutch ethnic majority group.
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26 608 There is a possibility that some ethnic minority students refrained from expressing points of view
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28 609 relating to discrimination. To counter this, [A1] was aware of this possibility during the
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30 610 interview and did her best to create a safe environment in which participants might feel more free
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32 611 to talk about their experiences.
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36 612 As we did not ask participants about the demographic characteristics of their alters, in the way
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38 613 that for example Woolf et al.³⁰ did (using ethnic group categories and gender), we could not say
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40 614 much with certainty about the potential similarity (or '*homogeneity*'³⁰) of participants' social
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42 615 networks. Therefore, we do not know for sure whether social network connections of participants
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44 616 had similar socio-economic or ethnic backgrounds, and whether this led to important differences
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46 617 between traditional and non-traditional students. We recommend future research to include this
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48 618 dimension of (potentially unequal) access to valuable social network connections.
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619 Implications

620 Our findings provide direction for universities aiming to remove barriers which enlarge unequal
621 opportunities to participate in HPE programs. For example, they could abandon selection criteria
622 known to be influenced by factors such as access to a social network in healthcare or SES. They
623 could also focus on providing nontraditional high school students with a network in the medical
624 field, as a medical social network and the access it provides to other facilitators such as
625 information and healthcare experience can take away numerous (psychological) barriers. If
626 barriers for nontraditional students are related to a potential candidate's low SES, policies such
627 as financial support programs can help to promote widening participation in HPE. When
628 unrealistic perceived barriers (based on incorrect information) restrict a student's willingness to
629 try to apply, then this self-selection process could be prevented by a more suitable provision of
630 information. This provision should be specifically designed to successfully reach nontraditional
631 potential candidates, in order to increase their perception of potential candidacy. In combination
632 with equitable admissions procedures⁵⁴, this could help HPE programs to achieve a more
633 representative student population and subsequently a better quality of health education and
634 care⁵⁵.

635 Conclusion

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

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3 641 for students of different backgrounds to prepare for the selection procedure, is a matter of
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5 642 concern.
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643 Declarations

644 Consent for publication

645 Participants were informed in the study information letter that their data would be anonymized
646 for publication. Participants are unidentifiable in this manuscript.

647 Availability of data and materials

648 The data that support the findings of this study are not publicly available due to them containing
649 information that could compromise research participant privacy and consent.

650 Competing interests

651 The authors declare that they have no competing interests.

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656 Author contributions

657 AW, JHR, GC and RAK conceived the idea for the research. LM, AW, and RAK designed the
658 research. LM interviewed all participants. LM, AW, SFK, and RAK analysed the data. LM wrote
659 the first draft of the article and all co-authors contributed to the article with important critical
660 revisions in multiple revision rounds. The final manuscript is the result of the combined expertise
661 of all authors and is approved for publication by all authors. All individuals who qualify for
662 authorship are listed as authors.

663 Ethics statement

664 Medical Ethics Committee, Amsterdam UMC, location VUmc, ID 2019.274

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668 References

- 670 1. Alexander K, Cleland J. Social inclusion or social engineering? The politics and reality of
671 widening access to medicine in the UK. In: Shah M, McKay J, eds. *Achieving Equity and Quality
672 in Higher Education: Global Perspectives in an Era of Widening Participation*. Springer;
673 2018:143-172.
- 674 2. Griffin B, Hu W. The interaction of socio-economic status and gender in widening
675 participation in medicine. *Med Educ*. 2015;49(1):103-113.
- 676 3. Van den Broek A, de Korte K, Mulder J, Bendig-Jacobs J. Numerus fixus, selectie en
677 kansengelijkheid in het wetenschappelijk onderwijs. 2018;
- 678 4. Van den Broek A, Mulder J, de Korte K, Bendig-Jacobs J, van Essen M. Selectie bij
679 opleidingen met een numerus fixus & de toegankelijkheid van het hoger onderwijs. *Onderzoek in
680 opdracht van het Ministerie van OCW, Nijmegen, ResearchNed*. 2018;
- 681 5. Steven K, Dowell J, Jackson C, Guthrie B. Fair access to medicine? Retrospective
682 analysis of UK medical schools application data 2009-2012 using three measures of
683 socioeconomic status. *BMC Med Educ*. 2016;16(1):11.
- 684 6. Griffin-Famble C, Valentine P, Jackson-Hammond C. Call for a new agenda: educational
685 policies and practices addressing a more diverse health professions workforce. *Journal of Best
686 Practices in Health Professions Diversity*. 2009;2(2):1-16.
- 687 7. Clayborne EP, Martin DR, Goett RR, Chandrasekaran EB, McGreevy J. Diversity
688 pipelines: The rationale to recruit and support minority physicians. *JACEP Open*. 2021;2:e12343
- 689 8. Stegers-Jager K, Themmen A, Cohen-Schotanus J, Steyerberg E. Predicting performance:
690 relative importance of students' background and past performance. *Med Educ* 2015;49(9):933–
691 45.
- 692 9. Alexander K, Fahey Palma T, Nicholson S, Cleland J. 'Why not you?' Discourses of
693 widening access on UK medical school websites. *Med Educ*. 2017;51(6):598-611.
694 doi:<https://doi.org/10.1111/medu.13264>
- 695 10. Niven V, Andiappan M, Cabot L, Gallagher JE. Embarking on a professional career:
696 social advantage in dentistry and medicine. UK dental and medical student applications and
697 admissions, 1996-2011. *British Dental Journal*. 2019;227(5):411-418.
- 698 11. Grafton-Clarke C. Is it too difficult for disadvantaged applicants to get into medical
699 school? *Med Teach*. 2016;38(11):1184.
- 700 12. Lievens F, Patterson F, Corstjens J, Martin S, Nicholson S. Widening access in selection
701 using situational judgement tests: evidence from the UKCAT. *Med Educ*. 2016;50(6):624-636.
702 doi:doi:10.1111/medu.13060
- 703 13. Puddey IB, Mercer A, Carr SE, Loudon W. Potential influence of selection criteria on the
704 demographic composition of students in an Australian medical school. *BMC Med Educ*.
705 2011;11(1):97.

- 1
2
3 706 14. Wouters A, Croiset G, Kusrkar R. Selection and lottery in medical school admissions:
4 707 who gains and who loses? *MedEdPublish*. 2018;7(4):50.
5 708 doi:<https://doi.org/10.15694/mep.2018.0000271.1>
6
7 709 15. Wouters A, Croiset G, Isik U, Kusrkar RA. Motivation of Dutch high school students
8 710 from various backgrounds for applying to study medicine: a qualitative study. *BMJ Open*.
9 711 2017;7(5):e014779. doi:<https://doi.org/10.1136/bmjopen-2016-014779>
10 712 16. Laurence CO, Zajac IT, Lorimer M, Turnbull DA, Sumner KE. The impact of
11 713 preparatory activities on medical school selection outcomes: a cross-sectional survey of
12 714 applicants to the university of Adelaide medical school in 2007. *BMC Med Educ*. 2013;13:159.
13 715 doi:<https://doi.org/10.1186/1472-6920-13-159>
14 716 17. Wright S. Medical school personal statements: a measure of motivation or proxy for
15 717 cultural privilege? *Adv Health Sci Educ*. 2015;20(3):627–643.
16 718 doi:<https://doi.org/10.1007/s10459-014-9550-4>
17 719 18. Southgate E, Kelly BJ, Symonds IM. Disadvantage and the ‘capacity to aspire’ to
18 720 medical school. *Med Educ*. 2015;49(1):73-83.
19 721 19. Greenhalgh T, Seyan K, Boynton P. "Not a university type": focus group study of social
20 722 class, ethnic, and sex differences in school pupils' perceptions about medical school. *BMJ*.
21 723 2004;328:1541 doi:<https://doi.org/10.1136/bmj.328.7455.1541>
22 724 20. Ball R, Alexander K, Cleland J. “The biggest barrier was my own self”: the role of social
23 725 comparison in non-traditional students’ journey to medicine. *Perspect Med Educ*. 2020;9:147-
24 726 156. doi:<https://doi.org/10.1007/s40037-020-00580-6>
25 727 21. Wouters A. Getting to know our non-traditional and rejected medical school applicants.
26 728 *Perspect Med Educ*. 2020;9:132-134. doi:<https://doi.org/10.1007/s40037-020-00579-z>
27 729 22. Mathers J, Parry J. Why are there so few working-class applicants to medical schools?
28 730 Learning from the success stories. *Med Educ*. 2009;43(3):219-228.
29 731 23. McHarg J, Mattick K, Knight LV. Why people apply to medical school: implications for
30 732 widening participation activities. *Med Educ*. 2007;41(8):815-821.
31 733 24. Martin AJ, Beska BJ, Wood G, et al. Widening interest, widening participation: factors
32 734 influencing school students’ aspirations to study medicine. *BMC Med Educ*. 2018;18:117.
33 735 doi:<https://doi.org/10.1186/s12909-018-1221-3>
34 736 25. Sianou-Kyrgiou E, Tsiplakides I. Similar performance, but different choices: social class
35 737 and higher education choice in Greece. *Studies in Higher Educ*. 2011;36(1):89-102.
36 738 26. Bourdieu P. The Forms of Capital. In: Richardson J, ed. *Handbook of Theory and*
37 739 *Research for the Sociology of Education*. Greenwood; 1986:241–58.
38 740 27. Bassett AM, Brosnan C, Southgate E, Lempp H. The experiences of medical students
39 741 from First-in-Family (FiF) university backgrounds: a Bourdieusian perspective from one English
40 742 medical school. *Res in Post-Compulsory Educ*. 2019;24(4):331-355.
41 743 28. Hadinger MA. Underrepresented minorities in medical school admissions: a qualitative
42 744 study. *Teach and Learn in Med*. 2017;29(1):31-41.
43 745 29. Atherley AE, Nimmon L, Teunissen PW, Dolmans D, Hegazi I, Hu W. Students' social
44 746 networks are diverse, dynamic and deliberate when transitioning to clinical training. *Medical*
45 747 *Education*. 2021;55(3):376-386.
46 748 30. Woolf K, Potts HW, Patel S, McManus IC. The hidden medical school: a longitudinal
47 749 study of how social networks form, and how they relate to academic performance. *Med Teach*.
48 750 2012;34(7):577-86. doi:10.3109/0142159x.2012.669082

- 1
2
3 751 31. Sims LR. Into the Unknown: Experiences of Social Newcomers Entering Medical
4 752 Education. *Academic Medicine*. 9900:10.1097/ACM.0000000000004762.
5 753 doi:10.1097/acm.0000000000004762
6
7 754 32. Mulder L, Wouters A, Twisk JWR, et al. Selection for health professions education leads
8 755 to increased inequality of opportunity and decreased student diversity in The Netherlands, but
9 756 lottery is no solution: A retrospective multi-cohort study. *Medical Teacher*. 2022:1-10.
10 757 doi:10.1080/0142159X.2022.2041189
11 758 33. Denicolo P, Long T, Bradley-Cole K. *Constructivist Approaches and Research Methods: A Practical Guide to Exploring Personal Meanings*. SAGE Publications; 2016.
12 759
13 760 34. Kumar R. *Research methodology: a step-by-step guide for beginners*. 3rd ed. SAGE;
14 761 2011.
15
16 762 35. Stegers-Jager K. Lessons learned from 15 years of non-grades-based selection for
17 763 medical school. *Med Educ*. 2018;52(1):86-95. doi:<https://doi.org/10.1111/medu.13462>
18 764 36. Varpio L, Ajjawi R, Monrouxe LV, O'Brien BC, Rees C. Shedding the cobra effect:
19 765 problematising thematic emergence, triangulation, saturation and member checking. *Med Educ*.
20 766 2017;51(1):40-50.
21 767 37. Nimmon L, Atherley A. Qualitative ego networks in health professions education:
22 768 Capturing the self in relation to others. *Med Educ*. Jan 2022;56(1):71-81.
23 769 doi:10.1111/medu.14663
24 770 38. Barrett A, Kajamaa A, Johnston J. How to ... be reflexive when conducting qualitative
25 771 research. *Clin Teach*. 2020;17(1):9-12. doi:<https://doi.org/10.1111/tct.13133>
26 772 39. Mann S, Kelley L. Standing at the crossroads of modernist thought: Collins, Smith, and
27 773 the new feminist epistemologies. *Gender and Society*. 1997;11(4):391-408.
28 774 40. Kiger ME, Varpio L. Thematic analysis of qualitative data: AMEE Guide No. 131. *Med*
29 775 *Teach*. 2020:1-9. doi:<https://doi.org/10.1080/0142159X.2020.1755030>
30 776 41. Robb N, Dunkley L, Boynton P, Greenhalgh T. Looking for a better future: Identity
31 777 construction in socio-economically deprived 16-year olds considering a career in medicine. *Soc*
32 778 *Sci & Med*. 2007;65(4):738-754.
33 779 42. Bandura A. Self-efficacy mechanism in human agency. *American Psychologist*.
34 780 1982;37(2):122-147.
35 781 43. Barker C. *Making sense of cultural studies: central problems and critical debates*.
36 782 SAGE; 2002.
37 783 44. Bandura A. Self-efficacy: The foundation of agency. In: Perrig WJ, Grob A, eds. *Control*
38 784 *of Human Behavior, Mental Processes, and Consciousness: Essays in Honor of the 60th*
39 785 *Birthday of August Flammer*. Psychology Press; 2000:25-39.
40 786 45. Crenshaw K. Mapping the margins: Intersectionality, identity politics, and violence
41 787 against women of color. *Stanford Law Review*. 1991;43(6):1241-1299.
42 788 46. Wekker G. *White innocence: Paradoxes of colonialism and race*. Duke University Press;
43 789 2016.
44 790 47. de Vries E, Kathard H, Müller A. Debate: Why should gender-affirming health care be
45 791 included in health science curricula? *BMC Medical Education*. 2020/02/14 2020;20(1):51.
46 792 doi:10.1186/s12909-020-1963-6
47 793 48. Cavanagh A, Jabbar A, Vanstone M. Particularising 'experiences': Naming whiteness in
48 794 the academy. *Medical education*. 2021/05// 2021;55(5):548-550. doi:10.1111/medu.14451
49 795 49. Lacombe-Duncan A, Logie CH, Persad Y, et al. Implementation and evaluation of the
50 796 'Transgender Education for Affirmative and Competent HIV and Healthcare (TEACHH)'
51
52
53
54
55
56
57
58
59
60

- 797 provider education pilot. *BMC Medical Education*. 2021/11/04 2021;21(1):561.
798 doi:10.1186/s12909-021-02991-3
- 799 50. Committee on the Elimination of Racial Discrimination. Concluding observations on the
800 nineteenth to twenty-first periodic reports of the Netherlands. *United Nations*. 2015;
- 801 51. Dutch Inspectorate of Education. The state of education 2021 [De staat van het onderwijs
802 2021]. *Ministry of Education, Culture and Science*. 2021;
- 803 52. Freeman BK, Landry A, Trevino R, Grande D, Shea JA. Understanding the Leaky
804 Pipeline: Perceived Barriers to Pursuing a Career in Medicine or Dentistry Among
805 Underrepresented-in-Medicine Undergraduate Students. *Acad Med*. Jul 2016;91(7):987-93.
806 doi:10.1097/acm.0000000000001020
- 807 53. Seligman MEP, Abramson LY, Semmel A, von Baeyer C. Depressive attributional style.
808 *Journal of Abnormal Psychology*. 1979;88(3):242-247.
- 809 54. Talamantes E, Henderson MC, Fancher TL, Mullan F. Closing the gap: making medical
810 school admissions more equitable. *N Engl J Med*. 2019;380(9):803-805.
811 doi:doi:10.1056/NEJMp1808582
- 812 55. Cohen JJ, Gabriel BA, Terrell C. The case for diversity in the health care workforce.
813 *Health Affairs*. 2002;21(5):90-102.

815 **Figure legend**

816
817 Figure 1. Six-step framework, adapted from Kiger and Varpio (2020)
818 Figure 2. This flowchart maps the core utterances of all transcripts, analyzing the links between
819 these utterances as expressed by the participants, and categorizing them as ‘facilitators’,
820 ‘barriers’, or ‘approaches to overcome barriers’ which are at play, and interact, in different
821 phases of the process to get ready for selection.
822 Note: Arrows have different patterns for readability but have the same meaning.
823 SNC = Social network connection
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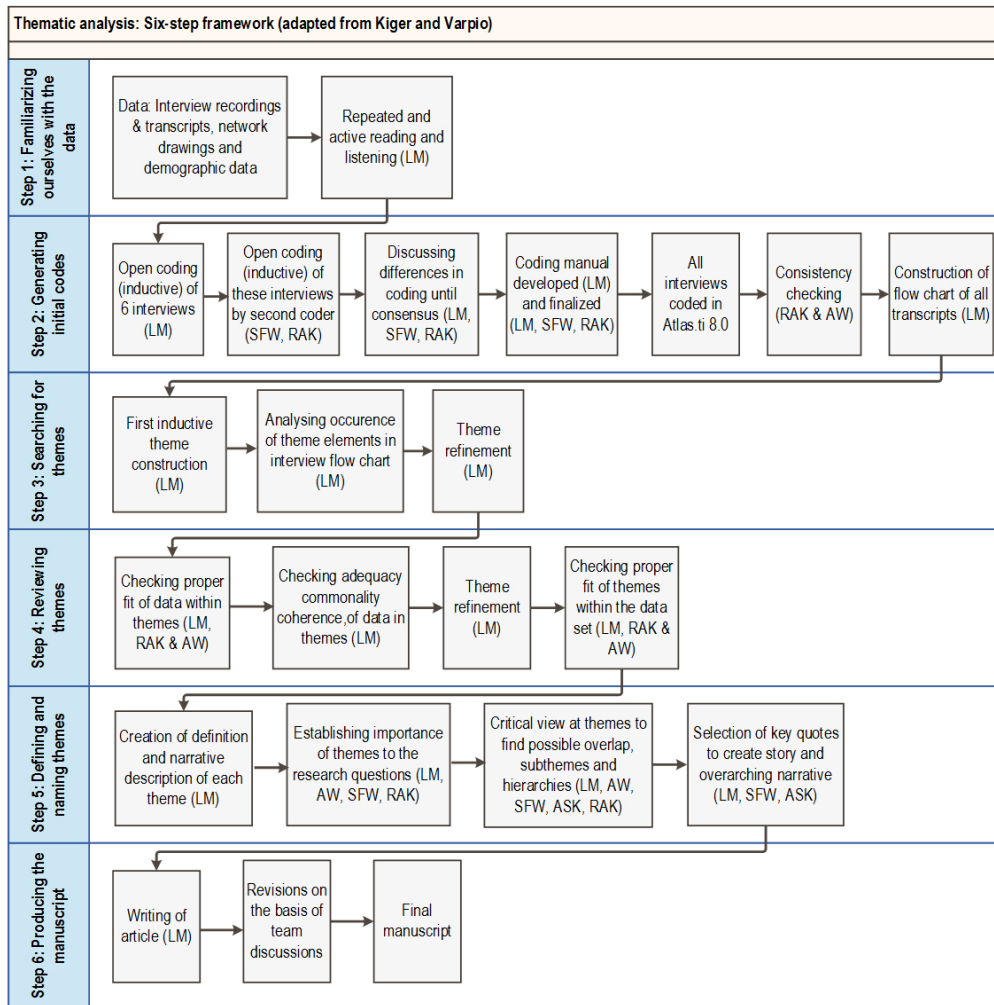


Figure 1. Six-step framework, adapted from Kiger and Varpio (2020)

735x737mm (39 x 39 DPI)

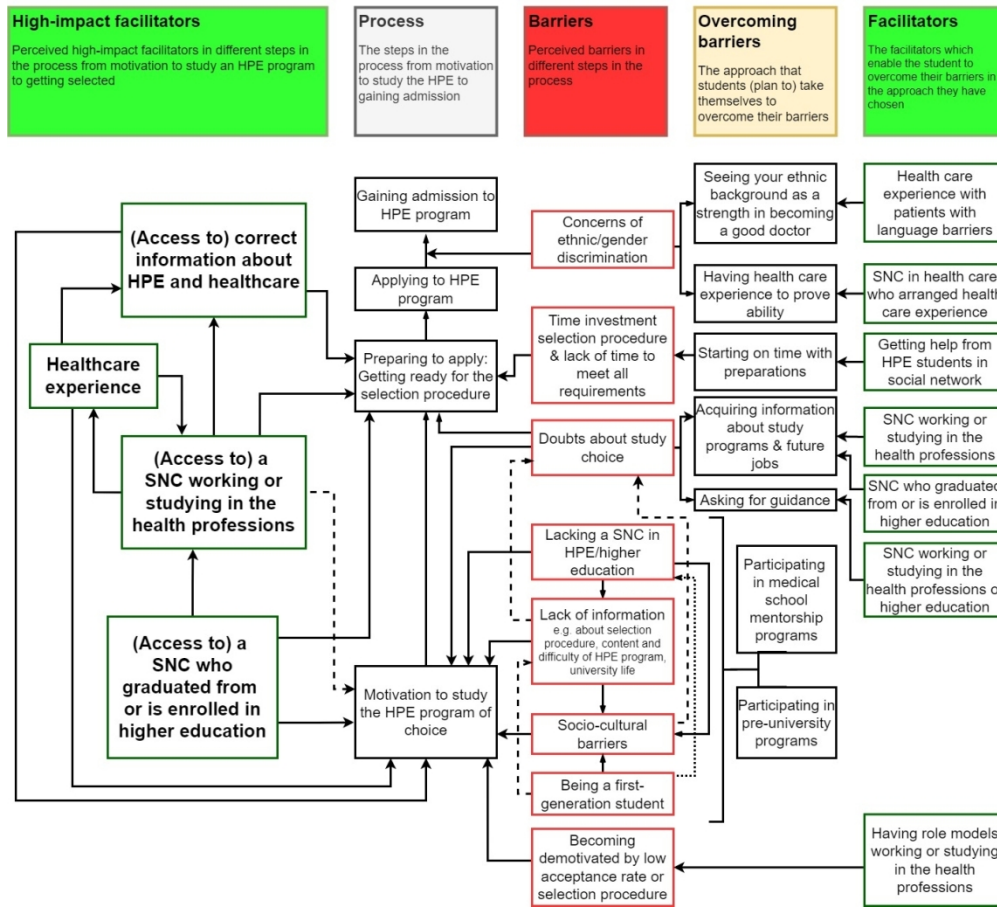


Figure 2

498x452mm (72 x 72 DPI)

Appendix 1: Topic list for interviews

1. Personal background characteristics
2. Reasons for interest in preferred HPE program
3. Opinion about selection procedures of HPE program
4. Expectations of what is necessary to be successful in the selection processes
5. Personal preparations for selection
6. What could help you to successfully apply for the preferred HPE program (personally, and what university, selection committee, government, others could do)
7. Expected chance of success in application
8. Possible barriers to be admitted for themselves and others
9. How student could gain access to things that may increase chances of getting admitted
10. Network drawing: which people in your life play a role in making a decision regarding your study choice?
11. Network drawing: which people in your life could help you to prepare for the selection procedure to gain admission to the HPE program of your choice?

Original study protocol

(attached as PDF)

Note to editors: The original study protocol is written in Dutch. We can provide an English translation if required.

Standards for Reporting Qualitative Research (SRQR)*

<http://www.equator-network.org/reporting-guidelines/srqr/>

Page/line no(s).

Title and abstract

<p>Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended</p>	p 1, l 1-2
<p>Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions</p>	p 2-3

Introduction

<p>Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement</p>	p 5-7
<p>Purpose or research question - Purpose of the study and specific objectives or questions</p>	p 7, l 157-160

Methods

<p>Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**</p>	p 10, l 214-222
<p>Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability</p>	p 9, l 198-209
<p>Context - Setting/site and salient contextual factors; rationale**</p>	p 8, l 177-183
<p>Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**</p>	p 8, l 167-183
<p>Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues</p>	p 30, l 574-580
<p>Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**</p>	p 7-9, l 165-197, p 10, l 220-222, Figure 1

Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	p 30, l 577-580, p 9, l 188-197, Appendix 1
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	Table 1
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	p 10, l 214-222 p 30, l 594-599 Figure 1
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	p 10, l 214-222 Figure 1, p 30, l 594-599
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	p 9, l 199-209

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	p 11-23
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	p 11-23, incl. Tables 3-5

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	p 24-29
Limitations - Trustworthiness and limitations of findings	p 28, l 532-549

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	p 30, l 588
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	p 30, l 590-591

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

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**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:
O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
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