What is the evidence for medical school applicants’ reasons for choosing medicine? A qualitative study

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Abstract

Background

It is important for medical school applicants and faculties to identify applicants’ reasons for choosing medicine as a career. Several studies suggest that there is a discrepancy between applicants’ real reasons for choosing medicine and those presented in entrance examinations. This discrepancy can be addressed in terms of evidence in which applicants identify reasons as their own. This study thus aims to explore applicants’ evidence for their real and stated reasons for choosing medicine.

Methods

The paradigm of this study is constructivism. We carried out individual semi-structured interviews with 15 medical students or physicians who had entered medical school through graduate-entry programs in Japan. In the interviews, we explored the participants’ real and stated reasons, including evidence for these reasons. We analyzed the data by conducting a reflexive thematic analysis on applicants’ evidence for their real and stated reasons.

Results

The thematic analysis on applicants’ evidence for their real reasons revealed six themes: (a) an idea since childhood or adolescence; (b) an episode of disease in one's family or patient; (c) further development of one's past major; (d) a comparison of the meaning and value of work; (e) an absence of evidence; and (f) an inability to identify one's reasons or evidence. Moreover, the thematic analysis on applicants’ evidence for their stated reasons revealed four themes: (a) an episode of disease in one’s family or patient; (b) further development of one’s past major; (c) a comparison of the meaning and value of work; and (d) no explanations in the entrance examination.

Conclusions

This study clarified medical school applicants’ evidence for their real and stated reasons for choosing medicine as a career. The most important finding is the possibility that applicants may not even be able to justify their real reasons with evidence. Moreover, they can arbitrarily present their stated reasons and evidence for them in entrance examinations regardless of whether their real and stated reasons coincide. Medical faculties should reconsider why and how they ask applicants about their reasons for choosing medicine in the student selection process.

Introduction
Background

It is important for medical school applicants to identify their reasons for choosing medicine as a career. This is not because they are required to explain their reasons during entrance examinations for medical schools, but because this choice of profession is crucial to their lives [1] and their reasons can affect their professional identities [2]. Medical education researchers have reported applicants’ reasons for choosing medicine: a good salary, a prestigious profession, a wide range of professional opportunities, intellectual content, helping people, conducting medical research, a physician in the family, parental expectations, and so on [1, 3–6]. In addition, several researchers have explored an association between applicants’ demographic and socioeconomic factors and their reasons for choosing medicine [3, 4, 7, 8]. However, little is known about how applicants reach these reasons—in other words, what they regard as evidence for their reasons.

Moreover, it is important for medical faculties to identify applicants’ reasons for choosing medicine in the student selection process. This is because their reasons are associated with their motivation to study medicine [4], which in turn can assist medical faculties in predicting applicants’ future academic performance and learning behavior [6]. Yet, in entrance examinations, it is unclear whether applicants present the same reasons that they actually consider when choosing medicine as a career. Applicants often attempt to present reasons expected by medical faculties during entrance examinations [9, 10]. When selecting rural physicians, many faculties experience a situation where some applicants do not express what they really think about their future careers [11]. Thus, we assume that there is a discrepancy between medical school applicants’ real and stated reasons; applicants can deceive medical faculties in entrance examinations. Little is known about how applicants defend and justify their stated reasons (i.e., what applicants describe as evidence for their stated reasons).

Context

Japan has 50 public and 31 private medical schools as well as the National Defense Medical College of the Japan Defense Agency [12]. The academic performance required to pass these medical schools’ entrance examinations is generally high [13, 14]. All medical schools have adopted undergraduate medical education programs, which offer a six-year curriculum (Years 1–6), for high school graduates [12]. Although approaches to student selection vary, all include some combination of paper-based achievement tests, interviews, reports of high school grade-point averages, recommendations from students’ high school principals, and essays [12]. Additionally, several medical schools have implemented graduate-entry programs (GEPs), which provide a four- or five-year curriculum (Years 2–6 or Years 3–6) [12]. Most student selection processes involve interviews as well as academic examinations of English, biology, chemistry, physics, and mathematics [15]. GEPs began to recruit applicants with the ability to incorporate their experiences and skills into medicine in 1975 [16, 17]. Since these applicants are bold enough to change careers, they are expected to be able to explain their reasons for choosing medicine more explicitly than high school graduates [16, 18]. Most medical schools emphasize interview scores in
the selection process [16]. In recent years, however, some medical students have reportedly entered these programs even though they did not consider themselves appropriate candidates according to these programs’ aims [17]. Furthermore, some medical students might enter these programs merely to acquire medical licenses [18]. Hence, the verification of applicants’ real and stated reasons by medical faculties has become increasingly important.

Theoretical Framework

The question of why a particular reason, but not others, is important to an agent has been discussed in the field of reasons for action. According to a representative philosopher, Nagel [19], this epistemic question should be resolved when considering the agent’s action and choice. To answer this question, Williams [20] proposed a persuasive theory that emphasizes the agent’s recognition of preceding desires: the agent can identify the most important reason for their actions and choices by reflecting on their beliefs related to preceding desires [20]. These beliefs refer not only to those about preceding desires but also to dispositions of evaluation, patterns of emotional reaction, personal loyalties, various projects, and so on [20]. Although an agent can be unaware of or misunderstand their own reasons, they can discern the most important reason among other ones by reflecting on their beliefs [20].

To illustrate this theory, we present the following case, revised from an example introduced by Williams [21]. A pair of parents expects their child to become a physician because they think helping people is important. However, if their child does not think that helping people is important, the parents will fail to persuade the child to enter medical school. According to this theory, “helping people” is not the child’s reason because it is not associated with the child’s beliefs related to the child’s preceding desires. To persuade the child, they must provide the child with a new belief that helping people is associated with the child’s preceding desires or another reason associated with the child’s desires. As such, this theory is useful for considering why a particular reason is important to the agent.

Research Question

Based on the aforementioned theoretical framework, the present study aims to explore medical school applicants’ evidence for their real and stated reasons for choosing medicine as a career. The research questions (RQs) explored in this study are as follows:

RQ1: What do medical school applicants of GEPs in Japan regard as evidence for their real reasons for choosing medicine?

RQ2: What do medical school applicants of GEPs in Japan describe as evidence for their stated reasons for choosing medicine in entrance examinations?

Methods
Overview

The paradigm of this study is constructivism, in which one’s knowledge cannot be independent of oneself, and the researcher and the researched are inseparable [21]. The study’s design consists of individual semi-structured interviews and a reflexive thematic analysis [22].

Terminology

In this study, we define “real reasons” as reasons that applicants regard as most important when choosing medicine as a career, and “stated reasons” as those they mainly present in entrance examinations.

Participants

The inclusion criteria were medical students or physicians in or below post-graduate year 10 and those who had entered GEPs in Japan. The former criterion was set to consider participants’ memory and recall bias. The first author, SKi, recruited 18 candidates through convenience sampling by inviting his acquaintances to participate in the interviews, and received consent from 15 of them. The participant sampling was terminated based on data saturation. The demographics of the participants are shown in Table 1.
Table 1
Demographics of the participants.

<table>
<thead>
<tr>
<th>No.</th>
<th>Age</th>
<th>Gender</th>
<th>Grade</th>
<th>Specialty</th>
<th>Previous career before medical school</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30s</td>
<td>M</td>
<td>Year 5</td>
<td>None</td>
<td>Bureaucrat</td>
</tr>
<tr>
<td>2</td>
<td>30s</td>
<td>M</td>
<td>Year 4</td>
<td>None</td>
<td>Clinical engineer at a hospital</td>
</tr>
<tr>
<td>3</td>
<td>30s</td>
<td>M</td>
<td>PGY 5</td>
<td>Radiology</td>
<td>Businessman at an electric power company</td>
</tr>
<tr>
<td>4</td>
<td>30s</td>
<td>M</td>
<td>PGY 3</td>
<td>Otorhinolaryngology</td>
<td>Businessman at a venture company</td>
</tr>
<tr>
<td>5</td>
<td>30s</td>
<td>M</td>
<td>PGY 8</td>
<td>Cardiovascular surgery</td>
<td>Bachelor's student majoring in physics</td>
</tr>
<tr>
<td>6</td>
<td>30s</td>
<td>F</td>
<td>PGY 5</td>
<td>Anesthesiology</td>
<td>Research and development worker</td>
</tr>
<tr>
<td>7</td>
<td>30s</td>
<td>M</td>
<td>PGY 4</td>
<td>Pathology</td>
<td>Research and development worker</td>
</tr>
<tr>
<td>8</td>
<td>30s</td>
<td>M</td>
<td>PGY 6</td>
<td>Surgery</td>
<td>Master's student majoring in biology</td>
</tr>
<tr>
<td>9</td>
<td>30s</td>
<td>M</td>
<td>PGY 10</td>
<td>Infectious disease medicine</td>
<td>Bachelor’s student majoring in pharmacy</td>
</tr>
<tr>
<td>10</td>
<td>30s</td>
<td>F</td>
<td>PGY 2</td>
<td>None</td>
<td>Nurse at a hospital</td>
</tr>
<tr>
<td>11</td>
<td>20s</td>
<td>F</td>
<td>PGY 3</td>
<td>Dermatology</td>
<td>Bachelor’s student majoring in foreign languages</td>
</tr>
<tr>
<td>12</td>
<td>30s</td>
<td>M</td>
<td>PGY 8</td>
<td>Neurosurgery</td>
<td>Bachelor’s student majoring in veterinary medicine</td>
</tr>
<tr>
<td>13</td>
<td>30s</td>
<td>M</td>
<td>PGY 2</td>
<td>None</td>
<td>Master’s student majoring in biology</td>
</tr>
<tr>
<td>14</td>
<td>30s</td>
<td>M</td>
<td>PGY 1</td>
<td>None</td>
<td>Personal trainer at a gymnasium</td>
</tr>
<tr>
<td>15</td>
<td>30s</td>
<td>F</td>
<td>PGY 2</td>
<td>None</td>
<td>Bachelor’s student majoring in nutrition</td>
</tr>
</tbody>
</table>

Note. PGY, post-graduate year

Data Collection

SKi, and occasionally FT and HN, carried out individual semi-structured interviews for 60–120 minutes via Zoom while recording. According to interview guides, they explored the participants’ interest in
medicine, their career histories, their process of choosing a career, their values in life, their real reasons (and what they regarded as evidence) for choosing medicine, and their stated reasons (and what they described as evidence for them in entrance examinations). The interviews were held in a non-academic setting to avoid recreating the pressure of an assessment-based environment. After the interviews, the recorded data were anonymized (including the names of medical schools) and transcribed in Japanese.

Data analysis

To integrate the data in terms of constructivism [21], we adopted a reflexive thematic analysis, in which participants and researchers’ knowledge and experiences are valid resources of a study [22]. The focus of this analysis was applicants’ evidence for their real and stated reasons for choosing medicine as a career. First, SKi read the transcribed data several times to familiarize himself with the content. Second, he generated initial codes based on the theoretical framework. Third, he integrated the extracted codes into broader themes. Fourth, he reviewed and revised each code and theme by referring to the theoretical framework. Fifth, he defined and named themes in terms of coherency and validity. Finally, he selected final themes, which were considered the most representative of the data. FT and HN also conducted these processes and supervised the analysis in terms of its coherency and validity. The final version of the themes was identified over several discussions between the authors. The data were translated into English when preparing this article.

Reflexivity

Because the paradigm of this study is constructivism [21], we needed to reflect on the possibility that our knowledge and experiences could affect the data collection and analysis. Hence, we share our profiles and specialties. SKi is a cardiologist who entered a GEP after graduating from a bachelor’s course in Japan. He was a PhD student majoring in medical education while teaching medical school applicants how to prepare statements of purpose at a preparatory school. FT is an assistant professor majoring in the continuing education of physicians and lawyers; SKo is a professor majoring in ethics, particularly utilitarianism and medical ethics; and HN is a general internist and an experienced medical education researcher. We always considered the possibility that SKi could incorporate his perspectives and experiences into the data collection and analysis process.

Results

RQ1: What do medical school applicants of GEPs in Japan regard as evidence for their real reasons for choosing medicine?

When choosing medicine as a career, all participants identified reasons that they considered most important—that is, their real reasons. These were: to study medicine; to be engaged in clinical practice; to conduct scientific research; to help people in person; to earn a good salary; to live near one’s family; and to seek a field without tough competition (Table 2).
The thematic analysis revealed six themes regarding applicants’ evidence for their real reasons for choosing medicine (Table 2).

### Table 2
Real reasons for choosing medicine and evidence for these reasons.

<table>
<thead>
<tr>
<th>No.</th>
<th>Real reason for choosing medicine</th>
<th>Evidence for real reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To help people in person</td>
<td>A comparison of the meaning and value of work</td>
</tr>
<tr>
<td>2</td>
<td>To conduct scientific research</td>
<td><strong>An idea since childhood or adolescence</strong></td>
</tr>
<tr>
<td>3</td>
<td>To earn a good salary</td>
<td>(No mention in the interview)</td>
</tr>
<tr>
<td>4</td>
<td>To seek a field without tough competition</td>
<td>An idea since childhood or adolescence</td>
</tr>
<tr>
<td>5</td>
<td>*To help people in person</td>
<td>A comparison of the meaning and value of work</td>
</tr>
<tr>
<td>6</td>
<td>To conduct scientific research</td>
<td>A comparison of the meaning and value of work</td>
</tr>
<tr>
<td>7</td>
<td>To conduct scientific research</td>
<td>A comparison of the meaning and value of work</td>
</tr>
<tr>
<td>8</td>
<td>To earn a good salary</td>
<td>An absence of evidence</td>
</tr>
<tr>
<td>9</td>
<td>To help people in person</td>
<td>A comparison of the meaning and value of work</td>
</tr>
<tr>
<td>10</td>
<td>To be engaged in clinical practice</td>
<td>An episode of disease in one's family or patient</td>
</tr>
<tr>
<td>11</td>
<td>To live near one's family</td>
<td>An episode of disease in one's family or patient</td>
</tr>
<tr>
<td>12</td>
<td>*To earn a good salary</td>
<td>(No mention in the interview)</td>
</tr>
<tr>
<td>13</td>
<td>To earn a good salary</td>
<td>An idea since childhood or adolescence</td>
</tr>
<tr>
<td>14</td>
<td>To study medicine</td>
<td>Further development of one's past major</td>
</tr>
<tr>
<td>15</td>
<td>To be engaged in clinical practice</td>
<td>An absence of evidence</td>
</tr>
</tbody>
</table>

Note. *These participants retrospectively regarded the reason as not the most important. **This participant discovered new evidence for the real reason before the entrance examination.

(a) An idea since childhood or adolescence

The first theme was *an idea since childhood or adolescence*. Applicants can regard ideas since childhood or adolescence as evidence for their real reasons for choosing medicine.

Participant 4, who had been working for a venture company, had gradually become exhausted due to his demanding job duties. He entered medical school, citing the lack of tough competition in the medical field as the reason. According to him, this real reason was based on an idea that he had held since childhood and adolescence.

*I believed that I could work as a physician merely by acquiring a medical license because my father was a successful physician. I applied to GEPs because I wanted an escape. I was never fully committed to my
job at the company because I had the option of escaping to medical school ... In the venture company, I was incompetent as I was privileged by my wealthy family ... To be honest, I have been spoiled, or rather, I have lived a super easy life, so it was true ... Fundamentally, there is always something wrong with life, and I still feel that way at the hospital.

(b) An episode of disease in one's family or patient

The second theme was an episode of disease in one's family or patient. Applicants can regard episodes of disease in their families or patients as evidence for their real reasons for choosing medicine.

Participant 10, who had worked as a nurse at a general hospital, entered medical school because she had a continuous interest in clinical practice as a physician. This real reason was based on an episode of disease in her family when she was majoring in nursing.

I first started considering GEPs when I was in my third or fourth year of nursing school. At the time, my grandfather became terminally ill and senile. My relatives argued whether he should have a gastric lavage. I was a nursing student, so my parents asked me what they should do, but I did not know what to do. Furthermore, the physician at the time was not very reliable. He seemed to throw all the responsibility on the family, and the family was quite troubled. It would have been nice if there had been someone who could explain in an easy-to-understand way the disadvantages and advantages of gastric lavage, and the advantages and disadvantages of not having it, and I wanted to be someone like that.

(c) Further development of one's past major

The third theme was further development of one's past major. Applicants can regard further development of their past majors as evidence for their real reasons for choosing medicine.

Participant 14, who had been a personal trainer after majoring in exercise physiology, decided to enter medical school to study medicine. This real reason was justified by an idea of developing his interest in physiology.

Personal training is expensive, and it costs thousands of yen per hour, so many of my clients were people with money. Many of them were physicians. When I heard about them, I became increasingly interested in medicine. I had studied physiology myself, so that was why I became interested in medical school in the first place.

(d) A comparison of the meaning and value of work

The fourth theme was a comparison of the meaning and value of work. Applicants can justify their real reasons by comparing the meaning and value of work between their previous careers and medical ones.

Participant 1 had worked for underprivileged children as a bureaucrat. He entered medical school to help them in person through clinical practice. He justified this real reason by comparing the meaning and value of work.
I had a challenging experience in which I quit high school and acquired qualification to apply to college. Since adolescents often go through difficult times, I hoped to work for such children in the future. I gradually became aware of my desire to resolve the personal and concrete problems of children who are unable to go to school and who experience severe economic situations. I also wanted to help them in person instead of dealing with rules and systems of administration. I always wanted to address their personal and concrete problems, probably because I have had similar experiences. Unless these problems are resolved, I cannot really help those children. I realized that I could do a job that really meant something to me as a physician.

(e) An absence of evidence

The fifth theme was an absence of evidence. Applicants can justify their real reasons despite an absence of evidence for them.

Participant 8, who had been studying for a master’s degree in biology, had been looking for a job because he was worried about his salary after entering his next doctoral course. After failing to find a job, he entered medical school to earn a stable wage supported by professional skills. He clarified the absence of evidence for this real reason.

My career decision was strongly affected by my concern regarding my future salary. If I entered the next doctoral course, I would not be able to earn enough money. There was no particular evidence for this reason. I just thought that I did not want to enter the program. To be honest, my reason for choosing medicine was not because I wanted to work for my patients. It feels like this reason was almost non-existent.

Participant 15 entered medical school because she became interested in clinical practice as a physician when she was studying for a bachelor’s degree in nutrition. She did not need any evidence for this real reason, and took this lack of evidence for granted.

I cannot explain. It is difficult. There is no reason why one likes something. Likewise, I felt that I did not need a reason to be interested in becoming a physician. I simply longed to become a physician.

(f) An inability to identify one’s reason or evidence

The sixth theme was an inability to identify one’s reason or evidence. Applicants can be unaware of or misunderstand their real reasons and evidence for them when choosing medicine. Moreover, some of them cannot find the meaning and value for their pursuit and thus compromise on the option of being a physician.

Participant 5, who had been studying for a bachelor’s degree in physics, entered medical school to help people in person. At the time, he justified this real reason by comparing the meaning and value of work between physics and medicine. According to him, however, his reason was supported by self-deception,
and the real reason was his lack of confidence in his physics ability. Thus, applicants can misunderstand their own real reasons.

_Somewhere in my mind, I did not think that I had the ability to make a living as a researcher in physics... Nevertheless, at the time, not wanting to accept my lack of confidence, I tried to convince myself that I was capable of physics... Looking back, my reason for choosing medicine as a career was probably my lack of confidence for competing in physics. This reason was maybe the most representative of me... Even if I was asked at the time, I would probably never have mentioned that reason... I can now accept that reason because I do not regret my career decision._

Participant 2, who had worked as a clinical engineer, decided to enter medical school to conduct scientific research based on an idea that he had held since childhood. In the preparatory process for the entrance examination, he had discovered new evidence for this real reason. The evidence for his reason had thus changed from his idea since childhood, to an episode of disease in his family and may have reinforced his determination.

_My father suffered from an untreatable disease. Taking care of him was extremely difficult. To overcome this situation... I came to hold a slight hope that I might be able to develop a new treatment for the disease myself. Thus, I was able to work hard to pass the entrance examination starting in the middle of the preparation period. That final version of my statement of purpose [to conduct scientific research based on an episode of disease in his family] was excellent. Initially, my reasons were rather selfish, such as desiring to escape from my previous career's severe working conditions and to conduct research... The final version of my statement of purpose was naturally constructed based on my surroundings... Regarding when it changed, strictly speaking, I was reminded of that reason I had not recognized initially, thanks to a lecture on statements of purpose at my preparatory school._

Participant 12, who had been studying for a bachelor's degree in veterinary science, entered medical school to earn a stable wage supported by professional skills. Although he did not refer to evidence for this real reason during the interviews, he emphasized his inability to identify the meaning and value that he would commit to throughout his life. He was unable to find reasons for his pursuit and thus compromised on the option of being a physician because he thought that the profession of physician had a value that was easy to understand. As such, applicants’ real reasons can be due to compromises resulting from their inability to identify them.

_I was not able to identify the reason why I wanted to become a physician... I still do not know what I am aiming for... I should have sought my own answer eagerly. There would have been no problem if the answer was “a physician”... I can also regard my career choice in medicine as a resignation of deciding what values I would commit to. I might have depended on the value of being a physician, which was considered socially acceptable... I might have given up on seeking the worth that I found in the context of diverse values._
RQ2: What do medical school applicants of GEPs in Japan describe as evidence for their stated reasons for choosing medicine in entrance examinations?

The participants’ stated reasons for choosing medicine were: to study medicine; to be engaged in clinical practice; to conduct scientific research; and to help people in person (Table 3). In entrance examinations, some applicants presented the same reasons as their real ones, while others did not. Applicants did not mention several reasons, such as earning a good salary, living near one’s family, and seeking a field without tough competition in the entrance examination.

The thematic analysis revealed four themes regarding applicants’ evidence for their stated reasons for choosing medicine (Table 4). Moreover, applicants’ evidence for real and stated reasons can be different regardless of whether these reasons coincide.

<table>
<thead>
<tr>
<th>No.</th>
<th>Real reason for choosing medicine</th>
<th>Stated reason for choosing medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To help people in person</td>
<td>To help people in person</td>
</tr>
<tr>
<td>2</td>
<td>To conduct scientific research</td>
<td>To conduct scientific research</td>
</tr>
<tr>
<td>*3</td>
<td>To earn a good salary</td>
<td>To be engaged in clinical practice</td>
</tr>
<tr>
<td>*4</td>
<td>To seek a field without tough competition</td>
<td>To be engaged in clinical practice</td>
</tr>
<tr>
<td>5</td>
<td>To help people in person</td>
<td>To help people in person</td>
</tr>
<tr>
<td>6</td>
<td>To conduct scientific research</td>
<td>To conduct scientific research</td>
</tr>
<tr>
<td>7</td>
<td>To conduct scientific research</td>
<td>To conduct scientific research</td>
</tr>
<tr>
<td>*8</td>
<td>To earn a good salary</td>
<td>To study medicine</td>
</tr>
<tr>
<td>*9</td>
<td>To help people in person</td>
<td>To conduct scientific research</td>
</tr>
<tr>
<td>10</td>
<td>To be engaged in clinical practice</td>
<td>To be engaged in clinical practice</td>
</tr>
<tr>
<td>*11</td>
<td>To live near one’s family</td>
<td>To be engaged in clinical practice</td>
</tr>
<tr>
<td>*12</td>
<td>To earn a good salary</td>
<td>To help people in person</td>
</tr>
<tr>
<td>*13</td>
<td>To earn a good salary</td>
<td>To be engaged in clinical practice</td>
</tr>
<tr>
<td>14</td>
<td>To study medicine</td>
<td>To study medicine</td>
</tr>
<tr>
<td>15</td>
<td>To be engaged in clinical practice</td>
<td>To be engaged in clinical practice</td>
</tr>
</tbody>
</table>

Note. *These participants presented different reasons from their real ones in entrance examinations.
<table>
<thead>
<tr>
<th>No.</th>
<th>Evidence for real reason</th>
<th>Evidence for stated reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A comparison of the meaning and value of work</td>
<td>A comparison of the meaning and value of work</td>
</tr>
<tr>
<td>2</td>
<td>An idea since childhood or adolescence</td>
<td>An episode of disease in one's family or patient</td>
</tr>
<tr>
<td>*3</td>
<td>(No mention in the interview)</td>
<td>An episode of disease in one's family or patient</td>
</tr>
<tr>
<td>*4</td>
<td>An idea since childhood or adolescence</td>
<td>A comparison of the meaning and value of work</td>
</tr>
<tr>
<td>5</td>
<td>A comparison of the meaning and value of work</td>
<td>A comparison of the meaning and value of work</td>
</tr>
<tr>
<td>6</td>
<td>A comparison of the meaning and value of work</td>
<td>A comparison of the meaning and value of work</td>
</tr>
<tr>
<td>7</td>
<td>A comparison of the meaning and value of work</td>
<td>A comparison of the meaning and value of work</td>
</tr>
<tr>
<td>*8</td>
<td>An absence of evidence</td>
<td>Further development of one's past major</td>
</tr>
<tr>
<td>*9</td>
<td>A comparison of the meaning and value of work</td>
<td>Further development of one's past major</td>
</tr>
<tr>
<td>10</td>
<td>An episode of disease in one's family or patient</td>
<td>An episode of disease in one's family or patient</td>
</tr>
<tr>
<td>*11</td>
<td>An episode of disease in one's family or patient</td>
<td>No explanations in the entrance examination</td>
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<td>*12</td>
<td>(No mention in the interview)</td>
<td>No explanations in the entrance examination</td>
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<tr>
<td>*13</td>
<td>An idea since childhood or adolescence</td>
<td>Further development of one's past major</td>
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<td>14</td>
<td>Further development of one's past major</td>
<td>Further development of one's past major</td>
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<tr>
<td>15</td>
<td>An absence of evidence</td>
<td>An episode of disease in one's family or patient</td>
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Note. *These participants presented different reasons from their real ones in entrance examinations.

(a) An episode of disease in one's family or patient

The first theme was an episode of disease in one's family or patient. In entrance examinations, applicants can describe episodes of disease in their families or patients as evidence for their stated reasons.

Participant 3, who had worked for an electronic power company that was hit by a severe earthquake, entered medical school to earn a stable wage supported by professional skills. Nevertheless, in entrance
examinations, he presented a different reason (to be engaged in clinical practice) by describing an episode of disease in his family and attributing arbitrary significance to it.

*I probably presented a reason that was not my real one. Although I do not exactly remember it, maybe, my statement of purpose consisted of an episode of my relative’s disease and a physician taking care of him... I never mentioned the reason that I really found the most attractive: the high and stable salary of a physician. Because I partially had the reason [to be engaged in clinical practice] I previously mentioned... I exaggerated this one and defined it as my statement of purpose.*

Participant 10, who had worked as a nurse at a general hospital, entered medical school because she had a continuous interest in clinical practice. In entrance examinations, she described another episode and attributed significance to it to justify the same reason more effectively. Furthermore, her justification in entrance examinations was partially based on further development of her past major. Her statement of purpose was as follows:

*While I was working, I encountered a patient who was undergoing radiation therapy for cancer. Due to vomiting, she was unable to take walks or eat, which she had enjoyed doing in the past. The pain was diagnosed as being caused by newly discovered metastatic cancer. When we began to give the patient another round of medication, the pain was immediately relieved, and the patient settled into a peaceful state. Therefore, rather than just providing a nurse’s comfort and care, I saw that the physician had re-examined the patient and given a new diagnosis, and that the best possible treatment had been given to the patient. As a nurse, I have always valued my patients’ quality of life. However, I have come to believe that the medical approach to the patient is very important in maintaining the patient’s quality of life and activities of daily living.*

Participant 15 entered medical school because she became interested in medical practice while studying for a bachelor’s degree in nutrition. To provide evidence for this reason in entrance examinations, she described an episode of disease in her patient during her clinical clerkship in nutrition.

*Regarding my statement of purpose: during my clinical clerkship, I had a patient with hypertension who was pregnant. At the time, I saw a nutritionist take care of her from a nutritional point of view. In the end, however, she had to have a caesarean section right away... The baby was delivered early... Although there were things that could be done with nutrition, many more things could be done with medical treatments by physicians. I used this episode to explain why I wanted to cure my patients.*

However, she was unable to convincingly explain her reason until the end. This issue of inference refers to whether applicants’ reasons can deductively lead to the conclusion that they want to become physicians.

*If interviewers asked me why I did not choose to become a nutritionist, the only explanation that I could give was my desire to be engaged in treatment. This reason was awfully weak... Even now, I think that I cannot defend my reasoning.*

(b) Further development of one’s past major
The second theme was further development of one's past major. In entrance examinations, applicants can describe further development of their past majors as evidence for their stated reasons.

Participant 8 entered medical school for the sake of a stable wage after failing to find a job with a master's degree in biology. Nevertheless, in entrance examinations, he presented a different reason (to study medicine) by describing a field of his previous part-time job as evidence for this stated reason.

*If I remember correctly, I used to help with research at a hospital as a part-time job, and that was how I got interested in medical school ... That story was not so strange.*

(c) A comparison of the meaning and value of work

The third theme was a comparison of the meaning and value of work. In entrance examinations, applicants can provide evidence for their stated reasons by comparing the meaning and value of work between their previous careers and their medical ones.

Participant 1 had worked for underprivileged children as a bureaucrat. He entered medical school to help them in person through clinical practice. Likewise, in entrance examinations, he justified this reason by comparing the meaning and value of work. According to him, the reasons and evidence that were persuasive to him were also compelling to the interviewers.

*It was the same things I said earlier [his real reason and its justification] ... Because it was easy to explain to myself. It was ultimately easier to explain to others, too, because it was easier to convince myself of.*

Participant 4, who had been working for a venture company, had gradually become exhausted due to his demanding job duties. He entered medical school, citing the lack of tough competition in the medical field as the reason. Nevertheless, in entrance examinations, he presented a different reason (to be engaged in clinical practice) by comparing the meaning and value of work, because this reason and evidence were easy to understand.

*What I said was that, when I was a child, I did not really understand my father's work such as opening a clinic or medical care, but when I became an adult and became an office worker and interacted with society, I realized the value and greatness of contributing as a medical worker. It was an easy-to-understand story.*

(d) No explanations in the entrance examination

The fourth theme was no explanations in the entrance examination. Applicants could present their stated reasons without providing evidence for them.

Participant 12, who had been studying for a bachelor's degree in veterinary science, entered medical school to earn a stable wage supported by professional skills. Nevertheless, in entrance examinations, he presented a different reason (to help people in person) without providing evidence for this stated reason.
This strategy is considered an arbitrary preparation for convenient reasons and a defense based on those reasons.

The basis “for humans” was rather persuasive. After I prepared this basis, I was able to avoid embarrassment and logical fallacies in interviews … I had no evidence for this basis. I wondered if I had concrete experiences that could support this basis. For example, one’s own or a family member’s episode with an illness might be evidence … In the interviews, it is important to prepare a core reason that one can rely on no matter what the interviewers ask.

Discussion

This study highlighted medical school applicants’ evidence for their real reasons for choosing medicine as a career. Applicants can justify their real reasons based on ideas since childhood or adolescence, episodes of disease in their families or patients, and further development of their past majors. These types of evidence can be interpreted as one’s own experiences. As McManus claimed [4], however, applicants may overestimate or underestimate their experiences when considering a career. Based on this perspective, why applicants regard past experiences as valid evidence for their real reasons remains a mystery. Hence, the idea of the meaning and value of work, which justifies applicants’ real reasons, hints at an explanation for this mystery. According to Nagel [24], one can never epistemically justify any meanings and reasons that one attempts to commit to throughout one’s life because further evidence is needed to justify them. Therefore, the question of which meanings and reasons one commits to, falls into an endless loop of justifications and cannot be answered or must be arbitrarily silenced [24]. Based on this viewpoint, the question of which experiences applicants adopt as evidence for their real reasons, and of which meanings they attribute to these experiences, requires further evidence and falls into this endless cycle. Therefore, applicants are unable to justify their real reasons without arbitrary justifications. If they are aware of the arbitrariness of their justifications, they are unlikely to regard any reason as their own. This viewpoint can also explain why applicants do not need evidence for their real reasons and why they fail to identify those reasons and evidence for them. Applicants may have to reach their reasons for choosing medicine without evidence. The possibility that applicants may not be even able to justify their real reasons has rarely been discussed within academic medicine.

To the best of our knowledge, this study is the first to demonstrate the discrepancy between medical school applicants’ real and stated reasons for choosing medicine, although several researchers have suggested the existence of this discrepancy [4, 9–11]. The reasons that applicants present in entrance examinations could be understood in terms of self-determination theory (SDT) [6, 23]. Medical faculties’ notion of assessing applicants’ reasons based on the SDT might also be shared among the applicants [9, 10]. Moreover, this study focused on applicants’ evidence for their stated reasons because this evidence could be essential in verifying their real and stated reasons, if these were different. This study found that regardless of the existence of these differences, applicants could justify their stated reasons based on episodes of disease in their families or patients, further development of their past majors, and comparisons of the meaning and value of work. Although they adopt these types of justifications due to
their persuasiveness, they cannot be exempt from arbitrary justifications, according to the above-mentioned viewpoint. If they need arbitrary justifications even for their real reasons, all they can do to explain their reasons in entrance examinations, is to rely on arbitrary justifications for their stated reasons based on convenient evidence.

This study has several limitations. The first is regarding the study’s reliability and validity. As explained in the methods section, this study is based on constructivism [21]; as such, the data collection and analysis cannot be independent of the researchers and participants. It is possible that the participants were not honest about their real and stated reasons or their evidence for them in the interviews. The second limitation concerns the context, which is restricted to entrance examinations of GEPs of medical schools in Japan. The third limitation relates to the difference between reasons for resigning from previous careers and choosing medicine. Because both reasons can be closely connected, it is difficult to strictly focus on the latter. The fourth limitation pertains to the validity of evidence. This study cannot determine which evidence is valid for applicants’ real and stated reasons. The final limitation concerns the sufficiency and necessity of reasons for choosing medicine. This study does not discuss whether applicants’ reasons can deductively lead to the conclusion that they want to become physicians.

Conclusions

This study clarified medical school applicants’ evidence for their real and stated reasons for choosing medicine as a career. The most important finding is the possibility that applicants may not even be able to justify their real reasons with evidence. Moreover, they can arbitrarily present their stated reasons and evidence for them in entrance examinations regardless of whether their real and stated reasons coincide.

This study provides several possible implications for further medical education practice and research. First, the discrepancy between medical school applicants’ real and stated reasons for choosing medicine is an important issue in medical education [4, 9–11]. To further address this discrepancy, the study’s approach can be applied across diverse contexts as well as GEPs in Japan. Second, this study partially suggests that applicants are encouraged to study medicine according to their evidence for their reasons for choosing medicine. Medical education researchers may be able to clarify how medical students are affected by this evidence. Third, according to Barnhoorn et al. [2], medical students can remediate their unprofessional behaviors by reflecting on why they want to become physicians. However, medical students who suffer from the arbitrariness of this question will not be able to justify their reasons. Medical teachers should understand the possibility that there are no answers to the question of why their students want to become physicians. Fourth, medical faculties require applicants to explain their reasons for choosing medicine in the student selection process [4, 25]. However, there has been little discussion about what criteria medical faculties should use to determine if applicants have successfully explained their reasons. These criteria can be addressed in terms of the sufficiency and necessity of reasons for choosing medicine, and the nature and validity of evidence for them, which can include arbitrary justifications. We propose that medical faculties should ask applicants during entrance examinations to what extent they put trust in their reasons and the evidence for them, after sharing them with this
arbitrariness. Medical faculties should reconsider why and how they ask applicants about their reasons for choosing medicine in the selection process.

**Abbreviations**

GEPs, graduate-entry programs; RQs, research questions; SDT, self-determination theory

**Declarations**

**Ethics approval and consent to participate**

This study was conducted in accordance with the Declaration of Helsinki, reviewed and approved by the Kyoto University Graduate School and Faculty of Medicine, Ethics Committee (R2085). All participants signed informed consent forms.

**Consent for publication**

Not applicable.

**Availability of data and materials**

The data that support the findings are not openly available due to privacy concerns. The materials are available from the corresponding author upon reasonable request.

**Competing interests**

The authors declare that they have no competing interests.

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None.

**Authors’ contributions**

SKi conceptualized this study, performed the interviews and analyses, and prepared the article. FT partially performed the interviews and analyses, critically reviewed the study, and revised the article. SKo provided the theoretical framework, critically reviewed the study, and revised the article. HN partially performed the interviews and analyses, critically reviewed the study, and revised the article. All authors have read and approved the final manuscript.

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