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WEB PAPER

The desirable qualities of future doctors – A study of medical student perceptions

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Abstract

Background: There is a lack of consensus regarding the qualities possessed by the ideal doctor, and very limited research regarding the views of medical students on these qualities.

Aims: To investigate the views of commencing medical students regarding the desirable qualities of doctors.

Methods: A survey containing a set of proposed desirable qualities of doctors identified from the existing literature was completed by 158 first-year medical students.

Results: The survey had a 75% response rate. Students rated the individual qualities of empathy, motivation to be a doctor, good verbal communication, ethically sound, integrity and honesty as the most important. A factor analysis identified six categories of qualities: *methodical processing*, *cognitive capacity*, *people skills*, *generic work ethic*, *role certainty* and *warmth*. Significant differences in factor scores were found across subgroups of students (international and domestic students, with and without prior tertiary studies) on the following factors: *methodical processing*, which was scored highest by domestic students with prior tertiary studies, *cognitive capacity*, which was scored highest by domestic students without prior tertiary studies and *generic work ethic*, which was scored highest by international students.

Conclusions: Medical students identified a range of desirable personal qualities of a doctor which varied according to student characteristics, including their prior educational experience. Future research aiming to define such desirable qualities should include a broader range of stakeholders, including students at different training levels and institutions.

Introduction

The selection of medical students has been a contentious topic for the community and medical profession for many years (Beck 2004), especially since the implementation of the Flexner Report (Flexner 2002). The factors driving medical student selection are clear: there are more applicants than there are places in medical schools; and there is a desire to give the places to those who will make the 'best' doctors (Bore et al. 2009). While the former point is far from contentious the latter is based on the presumptions that we know what defines the 'best' or 'ideal' doctors, and that we know how to predict, prior to their commencement of medical training, who will become the best doctors. Desirable graduate attributes have been the focus of competency-based curriculum developments within medical schools worldwide (Frank et al. 2010). Such an approach emphasises that demonstrable operationalised capabilities across a number of domains are supported by foundations of knowledge, skills and attitudes (including personal qualities and attributes). Furthermore, the important focus on medical professionalism (Green et al. 2010; Lesser et al. 2010) has highlighted the role of these personal qualities in laying the foundations of such professionalism during medical school years. For example, the personal quality 'capacity for empathy' is likely to be a necessary component for the demonstration of effective communication skills with patients.

Practice points

- There is limited consensus regarding the most important personal qualities of medical graduates.
- One group of medical students regard empathy, motivation to be a doctor, good verbal communication, being ethically sound and honesty as the most important qualities.
- The ratings attached to these qualities vary according to students' key characteristics.
- Future research defining the most important qualities should include a range of stakeholders.

It has been argued, and generally agreed that becoming a good doctor requires more than knowledge-based academic achievement alone (Barr 2010) and identifying the desirable personal qualities of future doctors has become an important concern for medical student selection (Powis 2010). Nevertheless, these desirable qualities of the 'ideal' doctor have been difficult to define and the existing literature lacks a general consensus on these (Albanese et al. 2003). Despite the innovations made in processes and methods for medical student selection (Eva et al. 2004), inconsistent terminology is used to describe conceptually similar qualities. For example, some studies identify the quality of 'integrity' (Patterson et al. 2000), while others identify 'honesty' (Fones et al. 1998).

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One study (Price et al. 1971) identified 87 desirable qualities for doctors to possess. Other studies have consulted participants involved in medical education and healthcare to create their list of desirable qualities. This approach overlooks the views of the wider community. However, Fones and colleagues found little difference in the rankings of desirable qualities made by those with a medical background compared to those without (Fones et al. 1998). Patterson and colleagues investigated a competency model for general practitioners which included canvassing the views of patients (Patterson et al. 2000). The only qualities identified exclusively by general practitioners (GPs) were qualities external to the patient consultation, such as 'managing others', 'political awareness' and 'learning and personal development'.

Few studies have focused on the qualities that patients desire from their physicians. Bendapudi and colleagues surveyed 192 patients after they had been treated (as in- or out-patients) at a major teaching hospital in the United States (Bendapudi et al. 2006). They identified seven behaviours they desired their doctors to display. Their ideal physician was: confident, empathic, humane, personal, forthright, respectful and thorough.

Consensus papers from organisations such as the General Medical Council (GMC 2006, 2009) and the Association of American Medical Colleges (AAMC 1999) include guidance as to the qualities graduating medical students should possess, however, it is unclear how widely the authors consulted. The AAMC report claimed to contain a consensus of 'experts'. These qualities have been drawn upon in studies to determine which ones are the most important (Kearney 2005; Lambe & Bristow 2010). Although both studies ranked all the identified qualities as important, integrity, communication, empathy, coping with ambiguity and self-awareness were viewed as particularly important.

One of the most influential frameworks was developed in the Canadian Medical Education Directions for Specialists (CanMEDS) Project (RCPSC 2000, 2011) by the Royal College of Physicians and Surgeons of Canada. This project defined the core competencies of a doctor. They conducted an extensive consultation process, which included representatives from medical education, health professionals, affiliated stakeholders and the general public. They defined seven key roles of the ideal doctor: Medical Expert, Communicator, Collaborator, Manager, Health Advocate, Scholar and Professional. Importantly they suggest all the roles overlap equally to create the 'Medical Expert'.

In Australia, the Federal Government supported the Australian Medical Education Study (Lawson & Bearman, 2007), which sought to identify the factors that make for success in medical education. The study canvassed medical students, junior doctors, clinical trainers and educators, and employers using surveys, interviews and focus groups. While the qualities of doctors were not the main focus of the study, they identified independence, motivation, confidence, compassion and self-insight amongst the range of key professional attributes.

Medical students' views on the desirable qualities of doctors have seldom been canvassed, despite medical students being key stakeholders in medical education. Such information is potentially very informative about the values and aspirations of future doctors themselves, and could provide insights to the formation of professional identity and goals (Maudsley et al. 2007; Helmich & Dornan 2012). Furthermore, tracking the trajectory of such aspirations and values can provide additional insights regarding the role of both the explicit and the hidden curriculum in medical training (Hafferty 1998; Lempp & Seale 2004) on core attributes that influence professional conduct and behaviour. Maudsley and colleagues investigated prospective and junior medical students' notions of a good doctor. They found that traditionally termed non-cognitive qualities were ranked highly by these participants. These include such characteristics as being compassionate, being a listening and informative communicator, and an efficient, organised self-manager.

One study that specifically examined medical students' perceptions of desirable qualities was by Rabow and colleagues (Rabow et al. 2009). They extrapolated qualities from 100 personal mission statements written by United States medical students who participated in an elective 'healer's art course'. As this was an elective course, the participants may not be representative of US Medical Students or even one medical course. Further to this, desirable qualities were not the main focus of the mission statements, but rather one of the themes identified upon analysis. They found that constancy and integrity were the two qualities most frequently identified.

When a medical school considers its desirable graduate outcomes this may include consideration of what is teachable throughout their curriculum. Some qualities may be best evaluated at the point of selection and (hopefully) enhanced or promoted through medical school experience. Hence, the inclusion of assessment of such qualities within a selection procedure (Bore et al. 2009).

The current study is based within the Joint Medical Program (JMP), a five-year medical program run jointly by two universities in Australia – the Universities of Newcastle and New England. The JMP uses a Problem-Based Learning curriculum, and builds on University of Newcastle's program established in 1978. The University of Newcastle was the first Australian medical school to introduce the assessment of personal qualities through interview and testing. To select students, the JMP uses the Undergraduate Medicine and Health Sciences Admissions Test (UMAT) and (in the 2010 selection process) a panel style semi-structured interview, together with a minimum academic performance threshold in prior studies. The program selects from a wide range of applicants including high school leavers and those with prior graduate studies, and a small number of international applicants.

The primary aim of this study was to investigate the opinions of a cohort of first-year medical students regarding the most desirable qualities of a doctor, specifically those which may be considered as being innate to an individual and which would be difficult to teach. First-year medical students are key stakeholders and their views and experiences may impact on the presentation and selection of future doctors. Additionally, first-year medical students have also recently been through a process that may have required them to consider their qualities and the desirable qualities of doctors,

and so they should have considered opinions on this issue. Being first-year students they would not, on the whole, have had a significant exposure to medical education so they may have more idealistic views that are not influenced by the medical education (Patenaude et al. 2003). We hypothesised that the rating of qualities would vary according to key student characteristics, such as having prior tertiary education experience and being an international student, which represent the main pathways of entry into this medical program and more broadly across an international setting.

Methodology

Ethics approval

Ethics approval was granted by the University of Newcastle Human Research Ethics Committee and the University of New England Human Research Ethics Committee (approval number H-2011-0126). As the JMP spans two universities, ethics approval was required from both institutions.

Participants

All 210 first-year medical students enrolled in the JMP were invited to participate and complete the survey. One survey session was conducted at each university (i.e., the Universities of Newcastle and New England), so that all first-year medical students would have an opportunity to participate.

Individual year managers at each university campus were consulted regarding a suitable time for the students to participate. The survey was advertised to the students through their campus specific timetables. The 30-minute sessions were not listed as mandatory.

Materials and procedure

The self-administered surveys collected participant characteristics including: age, gender, interview location (Newcastle or Armidale), university and type of university place (Commonwealth Supported Place, Bonded Medical Place or International Student Place).

As noted earlier, there are a large number of qualities that are considered desirable for doctors to possess. On the basis of a review of the published literature, 31 qualities were identified for an inclusion into the survey. The participants were asked to rate each quality on a Likert scale, where 1 was 'not important at all' and 5 was 'vital' for a doctor to possess. Participants had the opportunity to write additional desirable qualities that may not have been in the survey.

When students arrived at the session they were given the hard copy survey and a participant information sheet. Background information about the research was presented and the voluntary nature of participation was emphasised. The researcher left the room and had other students collect the completed surveys so that the participants did not feel coercion to complete the survey.

Data analysis

A power analysis was conducted during the preparation phase for this study. For an estimated sample of 170 students out of 210 enroled in first year of the JMP (approximately 75% participation rate) and sub-group comparisons between two equal sized sub-groups, there would be an adequate statistical power (80%) to detect population differences in the order of 0.43 standard deviation units (a moderate effect size) using two-tailed 0.05 level significance tests. For comparisons between multiple sub-groups, detectable population differences (with 80% power) would vary by sub-group size (e.g., for 70 versus 70 participants, differences of 0.48 would be detectable; for 70 versus 30 participants, differences of 0.62 would be detectable).

Survey data were analysed using IBM SPSS Statistics Version 19 (SPSS, Chicago, IL, USA). Basic descriptive statistics (e.g., frequencies, means and standard deviations) are reported for the various student characteristics that were assessed, which were used in the identification of sub-groups within the sample. Respondents were also given the opportunity to identify up to five qualities they thought were most important for a doctor to possess. These could be additional to the list of 31 that was presented to them. Word frequencies, using QSR NVivo Version 9 (NVivo, Melbourne, VIC, Australia), were conducted for these responses.

Total means and percentages of endorsement were calculated for each of the desirable qualities, allowing these qualities to be ranked in order of perceived importance.

Principal components factor analyses were conducted using oblique rotation techniques. Items were then categorised according to factor loadings into separate domains. A series of planned comparisons between sub-groups was undertaken within an analysis of variance (ANOVA) framework. For all statistical analyses, the threshold for significance was set at $p < 0.05$.

Results

Respondent characteristics

At the session for survey completion in Newcastle, 114 students attended out of the 135 students enroled. One-hundred-and-seven surveys were returned that could be used for data entry. At the session held at the University of New England, 54 students attended out of the 75 enroled and 51 surveys were returned that could be used for the data analysis. This gave a total of 158 responses out of 210 students enroled and a participation rate of 75%. No information is available on non-responders.

The descriptive information about the respondents is illustrated in Table 1. Most respondents (75%) were less than 21 years old, 53% were female, 11% were international students, 55% had no previous tertiary studies and 19% speak a language other than English at home.

Desirable qualities

The full list of qualities and their mean ratings are presented in Table 2. It was hypothesised that the qualities that the

Table 1. Respondents' characteristics.

Characteristic	*n* (%)
Age	
18–20	119 (75)
21–25	22 (14)
26–30	8 (5)
31+	9 (6)
Gender	
Male	75 (47)
Female	83 (53)
University of study	
University of Newcastle	107 (68)
University of New England	51 (32)
Type of medical place	
Commonwealth supported place	107 (68)
Bonded medical place	25 (16)
Medical rural-bonded scholarship	7 (4)
International	18 (11)
Previous tertiary studies	
None	86 (55)
Completed partial degree	51 (32)
Completed full degree	19 (12)
Speaks language other than English at home	
Yes	30 (19)
No	126 (79.7)

Table 2. Ratings and endorsement of desirable qualities.

Rank according to mean	Quality[a]	Mean rating	Frequency of endorsement[b] (%)
1	Empathy	4.68	154 (97.5)
2	Motivation to be a doctor	4.58	156 (98.7)
3	Good verbal communication	4.58	147 (93)
4	Ethically sound	4.52	144 (91.1)
5	Honesty	4.48	140 (88.6)
6	Ability to work in a team	4.47	140 (88.6)
7	Perseverance	4.46	148 (93.7)
8	Composure under pressure	4.46	150 (94.9)
9	Emotionally mature/Stable	4.40	145 (91.8)
10	Supportiveness to others	4.40	140 (88.6)
11	Critical thinking	4.38	150 (94.9)
12	Comfort in dealing with people	4.35	137 (86.7)
13	Thoroughness	4.32	139 (88)
14	Adaptability	4.30	140 (88.6)
15	Ability to simplify and explain complex concepts	4.29	135 (85.4)
16	Cultural sensitivity	4.23	129 (81.6)
17	Decisiveness	4.23	135 (85.4)
18	Ability to work and think independently	4.19	128 (81.0)
19	Intelligence	4.09	129 (81.6)
20	Self confidence	4.06	130 (82.2)
21	Organisational skills	4.02	122 (77.2)
22	Academic ability	3.94	115 (72.8)
23	Tolerance of ambiguity	3.89	110 (69.6)
24	Altruism	3.88	102 (64.6)
25	Personal insight	3.83	106 (67.1)
26	Good level of personal health	3.80	107 (67.7)
27	Good leadership abilities	3.78	99 (62.7)
28	Devoted to work	3.69	102 (64.6)
29	Likeable personality	3.66	86 (54.4)
30	Ambitious	3.32	64 (40.5)
31	Does not take time-off work	2.31	12 (7.6)

Notes: [a]Qualities highlighted were being explicitly measured in the 2010 JMP admissions process.
[b]Endorsement referred to a rating of 4 or 5 (out of 5) by respondents.

respondents rated as most important would be comparable to those that the admissions process was attempting to identify. The qualities being measured (Powis et al. 1988) by the JMP admissions process are highlighted in Table 2.

The qualities with the highest mean ratings were: empathy, motivation to be a doctor, good verbal communication, being ethically sound and honesty (Table 2). Of these qualities, only one (motivation to be a doctor) was being explicitly assessed by the JMP in the 2010 admissions process.

A quality was considered to be endorsed if a respondent rated its importance with a four or five (out of five). The qualities that had the highest rates of endorsement were: motivation to be a doctor, empathy, composure under pressure, critical thinking and perseverance. Of those qualities only motivation to be a doctor was explicitly being assessed by the JMP.

The qualities identified most frequently within the additional open-ended responses related to: empathy ($n=57$), motivation ($n=38$), communication ($n=35$), intelligence ($n=26$) and perseverance ($n=24$). All additional qualities that were identified by five or more participants could be directly matched to comparable items on the list provided, hence they produced no newly identified qualities beyond those in the list.

To examine relationships between the 31 items in the list of desirable qualities, a principal components factor analysis was conducted using an oblique rotation technique. Based on an examination of the scree plot, six-, five- and four-dimensional solutions were examined. A six-factor solution (Table 3) was considered optimal that accounted for 51.7% of the variance in the original items. Loadings from the factor pattern matrix were used to allocate items to factors, which resulted in groupings shown in Table 3. Scores on the resultant factors were obtained by averaging the raw scores for all items assigned to each factor.

Broad labels were applied to each factor that encapsulated the qualities within the factor:

- *Methodical factor*: This comprised qualities such as thoroughness, critical thinking and organisational skills, reflecting what could be described as a methodical style of thinking and thought processes.
- *Cognitive capacity factor*: This factor included only three qualities: intelligence, academic ability and the ability to simplify and explain complex concepts.
- *People skills factor*: These qualities mostly refer to qualities that are useful when interacting with other people (e.g., comfort in dealing with people, cultural sensitivity and good verbal communication).
- *Generic work ethic factor*: This factor included qualities that could be sought after for all jobs and that reflected the responsibility one might feel to their work role.
- *Role certainty factor*: This factor referred to one's confidence and motivation to be a doctor, thus it appeared to link well with an applicant's certainty that medicine is the right career choice.
- *Warmth factor*: With qualities like empathy, supportiveness of others and altruism, this factor appears to contain items that captured a degree of interpersonal warmth and engagement with others.

Table 3. Principal components analysis of desirable qualities: Six factor solution.

		Factor loadings					
Factor label	Qualities	1	2	3	4	5	6
Methodical	Thoroughness	0.624	0.051	0.102	0.061	−0.070	0.125
	Critical thinking	0.600	0.005	−0.171	−0.024	−0.084	0.321
	Adaptability	0.572	0.069	−0.034	−0.097	−0.066	0.115
	Organisational skills	0.516	−0.037	0.250	−0.317	0.212	−0.065
	Tolerance of ambiguity	0.512	0.004	0.199	0.178	−0.011	−0.125
	Perseverance	0.468	0.241	−0.194	0.024	−0.147	0.015
	Ability to work and think independently	0.443	−0.163	0.408	−0.130	−0.063	0.008
	Personal insight	0.416	0.006	0.137	−0.298	−0.095	0.138
Cognitive capacity	Intelligence	−0.051	0.829	−0.004	−0.049	−0.027	0.013
	Academic ability	0.039	0.801	−0.033	0.002	−0.018	−0.030
	Ability to simplify and explain complex concepts	0.168	0.297	0.124	−0.056	−0.077	0.179
People skills	Good verbal communication	−0.014	0.153	0.766	0.144	−0.168	0.015
	Emotionally mature/Stable	0.022	−0.157	0.544	−0.042	−0.222	0.001
	Honesty	−0.032	0.174	0.538	−0.048	0.290	0.248
	Comfort in dealing with people	0.128	0.056	0.537	−0.150	−0.076	0.069
	Cultural sensitivity	0.181	0.002	0.464	−0.145	0.075	0.294
	Good level of personal health	0.266	0.051	0.434	−0.374	0.050	−0.105
Generic work ethic	Does not take time-off work	−0.113	−0.126	−0.010	−0.780	−0.006	−0.010
	Ambitious	0.110	0.377	−0.130	−0.590	−0.111	−0.210
	Devoted to work	−0.254	0.340	0.196	−0.576	0.024	0.207
	Likeable personality	0.092	0.271	0.141	−0.442	−0.037	0.024
	Good leadership abilities	0.225	0.060	−0.059	−0.428	−0.382	0.187
Role certainty	Motivation to be a doctor	−0.057	0.172	0.163	0.070	−0.686	0.022
	Composure under pressure	0.205	−0.154	−0.132	−0.263	−0.564	0.221
	Decisiveness	0.239	0.007	0.193	−0.217	−0.521	−0.032
	Self confidence	0.154	0.288	0.235	0.071	−0.464	−0.061
Warmth	Empathy	−0.035	−0.045	−0.112	−0.085	−0.230	0.787
	Ethically sound	−0.185	0.004	0.349	0.129	−0.203	0.586
	Supportiveness to others	0.233	0.173	0.060	0.171	0.173	0.570
	Altruism	0.145	0.039	0.031	−0.074	0.285	0.456
	Ability to work in a team	0.257	−0.121	0.215	−0.170	0.062	0.372

Table 4. Mean (SD) factor scores according to gender, age, language spoken at home and prior tertiary studies.

	Gender		Age		Language other than English spoken at home		Prior tertiary studies	
Factors	Male $n=74$	Female $n=83$	Less than 21 years $n=119$	21 years and older $n=38$	No $n=125$	Yes $n=30$	No $n=86$	Yes $n=69$
Methodical	4.17 (0.45)	4.18 (0.44)	4.12 (0.44)	4.4 (0.43)	4.17 (0.43)	4.18 (0.50)	4.13 (0.47)	4.26 (0.39)
Cognitive capacity	4.09 (0.57)	4.12 (0.51)	4.13 (0.54)	4.04 (0.56)	4.08 (0.49)	4.18 (0.72)	4.20 (0.55)	4.01 (0.50)
People skills	4.26 (0.53)	4.35 (0.57)	4.23 (0.51)	4.53 (0.35)	4.30 (0.48)	4.31 (0.54)	4.28 (0.53)	4.35 (0.45)
Generic work ethic	3.36 (0.65)	3.35 (0.49)	3.36 (0.60)	3.34 (0.64)	3.23 (0.59)	3.59 (0.61)	3.43 (0.59)	3.25 (0.63)
Role certainty	4.38 (0.46)	4.29 (0.49)	4.29 (0.49)	4.47 (0.41)	4.31 (0.46)	4.41 (0.54)	4.31 (0.51)	4.38 (0.43)
Warmth	4.33 (0.49)	4.43 (0.37)	4.36 (0.47)	4.46 (0.30)	4.41 (0.54)	4.49 (0.37)	4.40 (0.44)	4.37 (0.42)

The mean scores and standard deviations of the factors according to gender, age, language spoken at home and prior tertiary studies can be found in Table 4.

Sub group comparisons

Due to the inter-relationships between several student characteristics (e.g., higher age and prior tertiary studies; and language spoken at home and being an international student), three aggregate categories of students were created for the purpose of further analysis. These categories were:

(1) Domestic students with no prior tertiary studies ($n=70$).
(2) Domestic students with prior tertiary studies ($n=70$).
(3) International students ($n=18$).

Table 5. Characteristics of student categories.

Characteristic	Domestic – no prior tertiary studies (DN) $n=70$	Domestic – some prior tertiary studies (DT) $n=70$	International student (I) $n=18$
Age			
18–20	67 (95.7%)	41 (58.6%)	11 (61.1%)
21–25	1 (1.4%)	14 (20%)	7 (38.9%)
26–30	1 (1.4%)	7 (10%)	0 (0)
31+	1 (1.4%)	8 (11.4%)	0 (0)
Female	36 (51.4%)	33 (47.1%)	14 (77.8%)
Speak language other than English at home	8 (11.4%)	8 (11.6%)	14 (82.4%)
No prior tertiary studies	70 (100%)	0 (0)	16 (100%)

Table 6. Scores of the student categories on the desirable qualities factors.

Category of students	Methodical	Cognitive capacity	People skills	Generic work ethic	Role certainty	Warmth
Domestic – no prior tertiary studies (DN)	4.09[a]	4.21[b]	4.27	3.34[c]	4.26	4.38
Domestic – some prior tertiary studies (DT)	4.26[a]	4.01[b]	4.35	3.25	4.38	4.37
International student (I)	4.20	4.07	4.29	3.78[c]	4.43	4.44

Notes: [a]DT > DN, $p=0.026$.
[b]DT < DN, $p=0.02$.
[c]I > DN, $p=0.011$; 3 > 2, $p=0.003$

These categories were chosen as they represent the three main types of students that enter the JMP and the three main groups of students that study medicine more broadly in Australia. The JMP is one of the few medical programmes in Australia that accept students with no prior tertiary studies, partially completed tertiary studies and a completed tertiary degree. The characteristics of each category can be found in Table 5.

The average scores across the six desirable quality factors for each student category are shown in Table 6. Comparisons were made between each of the sub-groups on total factor scores. The planned comparisons analyses revealed four statistically significant differences among the categories. Domestic students with prior tertiary studies scored the methodical factor significantly higher than those without tertiary studies (4.26 versus 4.09, $t(133)=-2.25$, $p=0.026$). Scores on the cognitive capacity factor were significantly higher among domestic students without prior tertiary studies compared to domestic students with prior tertiary studies (4.21 versus 4.01, $t(137)=2.36$, $p=0.020$). International students scored the generic work ethic factor significantly higher than domestic students, both with (3.78 versus 3.25, $t(27)=-3.23$, $p=0.003$) and without (3.78 versus 3.34, $t(24)=-2.74$, $p=0.011$) prior tertiary studies.

Discussion

This research aimed to identify the qualities that a cohort of first-year medical students perceived as most desirable for a doctor to possess. These qualities include a mix of traditionally categorised cognitive and non-cognitive qualities. The highest ranked qualities that were most frequently endorsed were: motivation to be a doctor, empathy, composure under pressure, critical thinking and perseverance. Only one of those qualities (motivation to be a doctor) was being explicitly measured in the admission process that accepted them into their current course.

As with other studies in which participants have been presented with a number of qualities, all the qualities listed were rated as having importance for a doctor to possess. The qualities that were endorsed as most important by this sample of students concur with those that have also been identified elsewhere. In particular, empathy and perseverance have consistently been identified as amongst the most important qualities in previous research (Kearney 2005; Lambe & Bristow 2010).

A factor analysis identified six distinct sets of qualities: *methodical*, *cognitive capacity*, *people skills*, *generic work ethic*, *role certainty* and *warmth*. Qualities in the *methodical factor* were rated as most important by domestic students with prior tertiary studies. This factor included qualities such as perseverance, personal insight, tolerance of ambiguity and adaptability. These qualities may have been valued more by those students because of their extra study and life experience, perhaps because they had utilised or observed those qualities more than students who had no prior tertiary education. For example, students who have applied after tertiary studies may have required more perseverance to gain entry into medicine than those students who were accepted directly from the school.

The *cognitive capacity factor* was scored at a significantly higher level by domestic students with no previous tertiary studies. This factor contained three qualities (intelligence,

academic ability and ability to simply and explain complex concepts). Of particular note, academic ability may have been valued more by school leavers since their academic entry requirements were comparatively higher than those admitted on the basis of university academic performance. The older domestic students may have valued the cognitive factors relatively less due to their life experience leading them to value other non-cognitive qualities more highly.

International students scored the *generic work ethic factor* significantly higher than all the domestic students. However, even though there was a significant difference in scores, *generic work ethic factor* was still scored at a lower level than the five other desirable qualities factors, showing that there was still a broad agreement that those qualities were less important compared to the other ones presented. The *generic work ethic factor* scored much lower than the *warmth factor*, which was scored highest by all three of the student subgroups. This factor included empathy, altruism and ability to work in a team, being ethically sound and supportive to others. These are quite distinct from the qualities in the *generic work ethic factor*.

In providing a list of qualities for respondents to rate, there was a risk of not including qualities that may have been considered important. This was partially mediated by having open-ended questions follow the list of qualities. These questions allowed respondents to write down their five most important qualities, including ones that were not on the list. Since all qualities that were identified by five (3%) or more respondents could be directly linked to qualities in the survey's list, it adds confidence that important qualities were not omitted.

Only first-year medical students were involved in this component of the study. As a group, that have been selected and have chosen this program, this may signal an affinity to the nature of the medical program and the qualities it aims for its students and subsequent graduates to display. This may have served to create a more homogenous sample and as such provide less generalisable results. Despite the limitations of this sample, these results do serve to emphasise the multi-faceted nature of an ideal doctor as perceived by students. The mantra that academic performance is sufficient for selection of doctors is not supported by these participants, in line with recent literature (Barr 2010).

Most of the participants had recently (within 12 months) been through the JMP admission process. This process required them to consider medical professionals and the qualities that they should possess. This may have allowed the students to have a more idealistic view about the desirable qualities of a doctor that had yet to be significantly altered by exposure to medical education. Selection also considers the match of the applicant to the curriculum and model of medical education within the programme. The JMP is based on a problem-based learning model and the selection process undertaken by these students also assessed attributes that would match such a programme (e.g., capacity to work in teams and capacity for independent learning). It is possible that this is reflected in the ratings these students themselves apply to the qualities listed in this study. Studies across differing medical education programs would be of interest in investigating the influence of selection processes and curricula models on these perceptions.

These findings concur with those from a UK study of junior medical students, in which students identified compassionate, patient-centred care, good communication and exemplary professional behaviour as the most valued attributes of a 'good doctor' (Maudsley et al. 2007). Another study (Rabow et al. 2009) explored the perceptions of medical students specifically; however, desirable qualities were only part of one theme of the study. While the study did have students from a number of universities, it only included students enroled in one elective program. Unlike this research, it was not able to rank or prioritise the qualities that its participants identified.

A quantitative approach had more emphasis in this study compared to Maudsley and colleagues (Maudsley et al. 2007); however, both sets of cohorts still valued non-cognitive qualities highly. Both studies found variations in perceptions according to student backgrounds. Maudsley and colleagues found variation to socioeconomic status, while this study found variations according to prior education and international status.

This is the first study to the best of our knowledge that has looked solely at medical students and the impact of their characteristics on the perceptions of desirable qualities. Unfortunately, due to the overlapping nature of respondent characteristics such as prior tertiary studies and age, and the small size of this sample, it is difficult to determine the characteristics that have the biggest impact.

Medical students are trained to have potential to enter any area of medicine after graduation so they can serve communities across diverse settings. Ideally when determining and prioritising the most desirable qualities for doctors, the perceptions of a broader array of people should be canvassed. This research provides an insight into the perceptions of one stakeholder group; however, there are many more – for example, the differing needs and health profile of people in rural communities compared to urban communities (Handley et al. 2011), suggests that these communities also need to be consulted, as they have a large interest in the training of future doctors.

These students' perceptions may have been affected by the hidden curriculum in this medical programme. This effect can occur prior to the commencement of medical school as an admission process implies some qualities that a medical programme may hold (Hafferty, 1998). This is an invaluable information for a medical programme, because if there is a clear discrepancy between what the students identify and what the medical programme aims for its graduates to possess, it can highlight imperatives for the medical programme to address in its curriculum. The programme can target its teaching so that students may value and hopefully possess the qualities by the time they graduate. As this study's respondents were commencing medical students we may have been provided an insight into their emerging professional aspirations. Evaluation of how the perceptions of the qualities change over time within the programme may provide further insight into how the medical curriculum (including the formal, informal and hidden curricula) impact on students' perceptions of an ideal doctor.

Conclusion

The definition of an ideal or even good doctor is part of an ongoing discussion, which is strongly linked with the selection of medical students. Medical student selection occurs for a number of reasons, with most issues arising from the desire to select those who will become the best doctors. Once a medical programme decides to select for their determined desirable qualities, it faces the difficult task of using an admission process that utilises acceptable, reliable and valid tools to select students who hold or have the potential to hold these qualities.

This study was conducted on a group already selected into a medical programme on the basis of the JMP interview, hence, one may not be able to generalise these results to other students or groups. However, as there is limited research to date with medical students regarding this important issue, this research still provides a valuable insight.

This research, as outlined, has highlighted and ranked a number of qualities that first-year medical students endorse as desirable for a doctor to possess. Future research defining the qualities of an ideal doctor should include other groups that have a stake in the training of doctors.

Students' perceptions should be evaluated for a change throughout the medical training. This will provide further insights into the impacts of their medical training on student perceptions and how their potential professional aspirations may evolve.

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