Do medical students have a vocation for the profession? A case study in a public university

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Abstract

Introduction: A vocation is predisposition of an person to enter a certain profession or occupation, or to develop skills in certain arts; vocation among medical students is important to reducing their rates of leaving their studies in a subject where training is both lengthy and expensive.

Objective: To evaluate the vocational orientation of students admitted to the Faculty of Medicine at Agostinho Neto University in 2013 and assess whether there is any correlation between student achievement during the selection process and students vocation.

Methods: an observational, cross-sectional descriptive study was conducted on the vocational orientation of medical students; the study population consisted of all students admitted in 2013.

Results: Only 19.4% (n=19) demonstrated that they had a vocation for medicine and among those students there was an imperfect negative correlation between the results of the vocational test and the access exam.

Conclusion: The results of the study showed that the majority of students have vocational profiles that are incompatible with the medical profession.

Keywords: pre-graduate medical education; professional orientation; vocational profiles; admission criteria to faculty; self directed search

Introduction

The word ‘vocation’ comes from the Latin verb ‘vocare’, which means ‘to call’. Vocation is therefore a calling. The term ‘professional vocation’ refers to the specific area of knowledge (craft, occupation, profession) to which the individual has a greater inclination, that is, a greater commitment to developing the relevant skills (Millan et al., 2005).
Although many investigations have been carried out on the subject, little is known about the processes that interfere with the professional choices of young people when they are finishing their studies. Furthermore, the gradual increase of choices available hinders their professional choices. Discussions on who should enter the medical profession have become increasingly common over the last 70 years, and there is now a consensus that academic criteria alone should not be used for the selection of new medical professionals (Powis, 2015; Primi, Moggi and Casellato, 2004).

To select a profession in a mature manner, it is important for the individual to reflect on who they are and who they would like to be. A systematic, relatively effective and rapid way to do this is to use tools to evaluate professional interests; these can help the individual to understand what they know about themselves with regard to professional activities. Third-party influences often become an important factor in choosing a medical career, along with the desire to help others (Woodward, Thomas, Jallo et al., 2017).

There is no tool that addresses all the questions related to an individual's vocational exploration. Among the several tests available, one of the most widely used and disseminated worldwide is the Self-Directed Search (SDS) created by the American psychologist, John Holland (Ryan, and Rounds 1996). This test divides individuals into one of six profiles: Realistic, Investigative, Artistic, Social, Entrepreneurial, or Conventional, each being more compatible with certain professions (Welter, 2007; Puddey, Mercer, Carr , et al., 2011).

Since the 1990s, most medical schools have used the candidate's academic achievements, admission assessment marks, and an interview wherein communication skills are evaluated as selection criteria, without any regard for the potential student's vocation. However, this becomes relevant because in the presence of medical attitudes that the public do not deem appropriate, the vocation of the professional in that position is frequently questioned (Ahmed, Rhydderch, and Matthews, 2011; Conlon, Hecker, and Sabatini, 2012).

The need to create a fair, valid, transparent, and reliable alternative method to select candidates for medical courses has been emphasised in recent years, because of the ever increasing rates of egress from the profession not only by students but also by medical professionals. Almost all schools use academic grades as an admission criterion; however, this choice would be more valid if candidates were also selected for their vocation to become doctors (Conlon, Hecker, and Sabatini, S. 2012).

To this end, alternatives have emerged in some countries around the world, such as the UMAT in Australia or the UKCAT in the United Kingdom, which although based on academic criteria, make a broader assessment of the individual, including psychological aspects (Ahmed, Rhydderch, and Matthews, 2012; Almeida 2008).

At the Agostinho Neto University (Angola) the selection of candidates is still undertaken in the conventional manner. The Faculty of Medicine's entry requirement consists of an examination which has been the admission criterion since 1991, with almost no modifications to the present day (Mbala, 2010).

Taking into account the difficulties in adapting to the profession presented by the candidates admitted to the medicine course, the present study was intended to identify the students who have a vocation for medicine and to correlate the results of their vocational tests with the marks obtained in the admission assessment. The intention was to evaluate whether there is a relationship between both tools and consequently determine if the admission assessment actually selects the individuals who are more suitable than others to become doctors. It was anticipated that the most suitable candidates would be those with compatible vocational profiles and a good performance in the admission examination.
Materials and Methods

A cross-sectional study on the vocational profile of the students was conducted with students admitted to the Agostinho Neto University Faculty of Medicine in the academic year 2013.

Participants

The study population consisted of all students enrolled in the first year of the medicine course who were admitted through the 2013 admission examination. A total of 98 candidates (78.4%) participated in the study. Of the 98 participants in the study, 54 (55%) were female and 44 (45%) were male (table 1).

Table 1. Distribution of students according to age and gender

| Age group (years) | Gender |          | Gender |          | Total |
|------------------|--------|----------|--------|----------|-------|
|                  | Male   | Female   | Total  |          |       |
|                  | n      | %        | n      | %        | N     | %     |
| 15–19            | 15     | 33       | 31     | 67       | 46    | 47    |
| 20–24            | 25     | 57       | 19     | 43       | 44    | 45    |
| 25–29            | 2      | 33       | 4      | 67       | 6     | 6     |
| 30–34            | 2      | 100      | 0      | 0        | 2     | 2     |
| Total            | 44     | 45       | 54     | 55       | 98    | 100   |

Instruments

The admission examination results (provided by the vice-director for academic matters) and the vocational orientation test results based on the Self-Directed Search (SDS), the Brazilian version of the short form, were manually collected.

According to John Holland's RIASEC Methodology, each occupation is assigned a code; in the case of ‘general practitioner’, the code is ISA. The SDS was applied to the population under study and those who presented a vocational profile for the Medicine course (ISA code) were identified.

Procedure and Analysis

The results gathered were entered into a database in the Microsoft Office Excel 2010 program, and analysed by means of descriptive statistics (absolute and relative frequencies, averages and standard deviations) in SPSS 21.0 program. Once vocational profiles were evaluated, students with a vocation for the medicine course (ISA code) were identified and the score they obtained in the vocational profile evaluation and in the faculty's admission examination were correlated using the Pearson correlation coefficient.

Ethical Procedures

The study was authorised by the deputy director for academic affairs of the Agostinho Neto University (UAN) Faculty of Medicine.
The study was approved by the Ethics Committee of the UAN Medical School. resolution number 00121A / 2012.

The study participants were informed about the data collection procedures, and their anonymity in the research, and signed the consent form to participate.

The identity of the participants remains confidential and the information collected has solely been used for the purposes of the study.

Results

In the categorisation of students by vocational profiles according to Holland's RIASEC code, most students presented Social profiles (57%) followed by Investigative profiles (36%), which together represented an absolute majority of the students (93%), with only a small portion (7%) represented by the other four profiles of the RIASEC code (table 2).

Table 2. Distribution of students according to vocational profile

| Vocational Profile | n  | %  |
|--------------------|----|----|
| Realistic          | 0  | 0  |
| Investigative      | 35 | 36 |
| Artistic           | 5  | 5  |
| Social             | 56 | 57 |
| Entrepender        | 1  | 1  |
| Conventional       | 1  | 1  |
| Total              | 98 | 100|

When categorising the students according to the three-letter code, the SIA code was found for the majority of students (24.5%), followed by the ISA code (19.4%), which is the code classifying those with a vocation for medicine (table 3).

Table 3. Distribution of students according to the vocational orientation code

| Vocational Profile | n  | %  |
|--------------------|----|----|
| ISA                | 19 | 19.4|
| SIA                | 24 | 24.5|
| SAI                | 9  | 9.2 |
| ISE                | 9  | 9.2 |
| SIE                | 11 | 11.2|
| SIR                | 7  | 7.1 |
When the students that presented the ISA code were analysed specifically by correlating the marks in the admission examination and the scores on the vocational test (figure 1), an imperfect correlation between these variables was identified (Linear R = 0.19).

Figure 1. Correlation between the score in the vocational test and the score in the admission examination of students with ISA code profile.

| AIS          |      5 |      5.1 |
|--------------|--------|----------|
| Other profiles |       7 |      7.1 |
| Other profiles |       7 |      7.1 |
| Total        |      98 |     100  |

Discussion

Holland's SDS is one of the most widely used occupational assessment tools; however, there is no known tool available to determine whether an individual has the vocation to become a doctor. Nonetheless, the SDS is able to analyse the individual's psychosocial profile, thereby allowing the differences between individuals of the same group to be measured and to relate the profile of an individual and a particular profession (Harris, and Rottinghaus, 2017; Del Giudice, Booth, and Irwing, 2012 ).

There may be some factors influencing the outcome of the study, and the demographic profile of the study sample
(mostly young people under 25 years old) should not be ignored. If the individual has wider expectations other than just to train as a general practitioner (physician), he or she may not present the vocational profile to become a general practitioner: the profile may indicate that it is more suitable to become a neurosurgeon for example. This does not imply that the individual is in the wrong place, as attending medical school is a prerequisite for specialisation (Shulruf, Bagg, Begun, et al, 2018; Santos, 2012).

In the categorisation of students by vocational profiles, it was found that most of the individuals present the Social profile (57%), followed by the Investigative profile. The deconstruction of these profiles by professional orientation codes was examined to determine if, in theory, the candidates had a vocation for medicine. It was determined that only a minority (19.4%) present the ISA professional code that corresponds to the vocation for becoming a doctor. Without intending to be categorical, this means that of the 98 students who participated in the study, only 19.4% have a vocation for medicine according to the SDS results. This gives rise to the following question: if these individuals are the most suited for the profession, should they show the highest marks in the admission assessment? After performing the Pearson's correlation test, a negative correlation was found between the students who displayed the ISA code (19.4%) and the marks obtained in the admission assessment, where most individuals presented around ten values (the scale for this exam is 0-20 values); this means that the access examination did not prove to be capable of identifying the individuals with a vocation for medicine. This is a concern for several authors, and for the hypothesis of using multiple tools for student selection, as it has already been shown that using more than one tool could be a better predictor of success.

The results of this study are similar to those obtained in Brazil with the same instrument and a similar sample population (12th-grade students), where participants tended to demonstrate greater interest in the types of activities or professions classified under the Social profile to the detriment of the interests classified under the Realistic profile (Santos, 2012). They are also similar to those found in Portuguese 12th-grade students, who showed greater interest in the activities or professions classified as Social and less interest in activities or professions classified as Conventional (Ossai, Uwakwe, Anyanwagu, et al,& 2016). The resemblance of these findings to those found in this study confirm that an admission examination alone may not be the selection criterion, other studies had presented similar findings, bringing into question whether the admission examination is the best selection criterion.

This study, however, differs in part from the results found by Santos in a population of university students from various courses in Cape Verde where, in general, it was observed that the professional interests of the students appeared congruent with their course choices Carrión Pérez, 2002). However, when evaluating the courses compatible with the Realistic profile, it was found that the students presented a greater interest in the professions associated with the Social profile. Thus, according to these students' SDS results, they had no vocation for the courses in which they were enrolled, a similar finding as presented here (Adam, Bore, McKendree, et al., 2012; Kevat 2013).

The results obtained in the present study indicate that only a minority of the students actually have a vocation for medicine, which raises an issue for the the schools' admission systems', which have been studied in other parts of the world for some years. In Cuba, Perez (2002) demonstrated that the marks obtained in the admission examination were not a good predictor of academic success, while Castrilon (2008) found results similar to those presented here, in Colombia. These studies have led to changes in the student admission system of several countries, including Nigeria, where the admission examination is no longer the only candidate selection tool (Castrilon, 2008; Oyebola, 2006).

Although no previous studies on the vocation for the medical course in Angola exist, the problem of admission to the Faculty of Medicine has already been raised by other authors, who found similar results to those in this study
Monteiro, Barbosa, Carteado et al (2010) in his study entitled 'Option for the Medicine Course' concluded that most of the students opted for Altruism (rather than for a vocation), while Almeida characterised the selection tool as not being fully comprehensive. The results of this study are also in accordance with the ideas of Hughes, who recommends interviews as a supplementary means for selecting candidates (Hughes, 2002).

Even when a tool is modern and developed subsequent to the discussion on admission examination deficiencies, such as the UMAT, evaluation by a single tool has not proved to be a good predictor of academic success, and would probably not be associated with vocational profiles more compatible with the course (Sladek, Bond, Frost, et al. 2016; Abbiati, Baroffio, and Gerbase, 2016).

**Limitations**

This work has shed light on the discussion of medical candidate selection; however, it has the following limitations:

- The use of a single tool is insufficient to determine whether the individual has a vocation to enter the profession; however, the absence of correlation with academic performance is notable.
- Because vocation consists of a psychological orientation, it is a dynamic variable. Those students whose admission did not initially present a compatible vocational profile could evolve as the course develops, as could those who did present a compatible vocational profile.

**Conclusion**

The results of this study indicate that most students tend to have vocational profiles that are not compatible with the medical profession. It cannot be said from the results alone that medical practitioners have no vocation for the profession, but they certainly allow us to confirm that selecting the individuals who are most apt to become doctors through only a test of scientific knowledge is not the best option.

**Take Home Messages**

- Admission to medical school in low-income countries is difficult, making it even more important to select the best candidates
- We are far from having the definitive answer on which is the best tool for medical selection
- In several low-income countries the exploration and vocational guidance for medical students is not carried out
- Balance between vocation and theoretical knowledge is ideal

**Notes On Contributors**

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Bibliography/References

Abbiati, M., Baroffio, A., and Gerbase, M. W. (2016). ‘Personal profile of medical students selected through a knowledge-based exam only: are we missing suitable students?’. Medical Education Online, 21(1), pp 29705. https://doi.org/10.3402/meo.v21.29705

Adam, J., Bore, M., McKendree, J., Munro, D., et al (2012). ‘Can personal qualities of medical students predict in-course examination success and professional behaviour? An exploratory prospective cohort study’. BMC Medical Education, 12(1) pp 69. https://doi.org/10.1186/1472-6920-12-69

Ahmed, H., Rhydderch, M., and Matthews, P. (2012). ‘Can knowledge tests and situational judgement tests predict selection centre performance?’ Medical Education, 46(8), pp 777-784. https://doi.org/10.1111/j.1365-2923.2012.04303.x

Almeida P. (2008) ‘Políticas de admissão e seleção de estudantes para a Faculdade de Medicina da Universidade Agostinho Neto’. (dissertação). Luanda: Universidade Agostinho Neto.

Carrión Pérez, E. (2002). ‘Validación de características al ingreso como predictores del rendimiento académico en la carrera de medicina’. Educación Médica Superior, 16(1), pp 1-2.

Castrilon J.J.C., (2008) ‘Correlacion entre critérios de admissión e desempeño academico en estudiantes de la Faculdad de Medicina de la Universidade de Manizales’. Archivos de Medicina. 16(1), pp 1-2.

Conlon, P., Hecker, K., and Sabatini, S. (2012). ‘What should we be selecting for? A systematic approach for determining which personal characteristics to assess for during admissions’. BMC Medical Education, 12(1), pp 105. https://doi.org/10.1186/1472-6920-12-105

Del Giudice, M., Booth, T., and Irwing, P. (2012). ‘The distance between Mars and Venus: Measuring global sex differences in personality’. PloS One, 7(1) pp e29265. https://doi.org/10.1371/journal.pone.0029265

Harris, K. L., and Rottinghaus, P. J. (2017). ‘Vocational interest and personal style patterns: Exploring subjective well-being using the Strong Interest Inventory.’ Journal of Career Assessment, 25(2), pp 203-218. https://doi.org/10.1177/1069072715621009

Hughes, P. (2002). ‘Can we improve on how we select medical students?’. Journal of the Royal Society of Medicine, 95(1) pp 18-22. https://doi.org/10.1177/014107680209500106

Kantamneni, N. (2014). ‘Vocational interest structures for Asian Americans, Middle-Eastern Americans and Native Americans on the 2005 strong interest inventory.’ Journal of Vocational Behavior, 84(2), pp 133-141. https://doi.org/10.1016/j.jvb.2013.11.003

Kevat, D. A. (2013). ‘Only the best: medical student selection in Australia.’ The Medical Journal of Australia, 198(7), pp 366-367. https://doi.org/10.5694/mja12.11697
Mbala CL. (2010) 'Qualidade de vida dos estudantes da faculdade de medicina da universidade agostinho neto. (Monografia).’ Luanda: Universidade Agostinho Neto.

Millan, L. R., Azevedo, R. S., Rossi, E., De Marco, O. L. N., et al (2005). 'What is behind a student's choice for becoming a doctor?'. Clinics, 60(2), pp 143-150. https://doi.org/10.1590/S1807-59322005000200011

Monteiro, M. F. A. D., Barbosa, J. M. P., Carateu, E. M. F. L., Ferreira, M. A. D., et al (2010). ‘Choosing medical school in Angola: the case of Agostinho Neto University.’ Revista Brasileira de Educação Médica, 34(3), pp 346-354. https://doi.org/10.1590/S0100-55022010000300003

Ossai, E. N., Uwakwe, K. A., Anyanwagu, U. C., Ibiok, N. C., et al, (2016). ‘Specialty preferences among final year medical students in medical schools of southeast Nigeria: need for career guidance.’ BMC Medical Education, 16(1), pp 259. https://doi.org/10.1186/s12909-016-0781-3

Oyebola C. (2006). ‘Admission of medical students in Nigeria.’ BMC Med Ed. 208(5), pp 214-218.

Powis D. (2015) 'Selecting medical students: an unresolved challenge.’ Medical Teacher. 37(3) pp 252–60. https://doi.org/10.3109/0142159X.2014.993600

Primi, R., Moggi, M. A., and Casellato, E. O. (2004). ‘Correlational study of the self-directed search with the IFP.’ Psicologia Escolar e Educacional, 8(1), pp 47-54. https://doi.org/10.1590/S1413-85572004000100006

Puddey, I. B., Mercer, A., Carr, S. E., and Louden, W. (2011). 'Potential influence of selection criteria on the demographic composition of students in an Australian medical school.' BMC Medical Education, 11(1) pp 97. https://doi.org/10.1186/1472-6920-11-97

Ryan, J. M., Tracey, T. J., and Rounds, J. (1996). ‘Generalizability of Holland's structure of vocational interests across ethnicity, gender, and socioeconomic status.’ Journal of Counseling Psychology, 43(3), pp 330. https://doi.org/10.1037/0022-0167.43.3.330

Santos, I. M. G. D. (2012). ‘Os interesses e as escolhas profissionais de acordo com os 6 tipos de personalidade propostos por Holland (RIASEC) numa amostra de estudantes do ensino superior em Cabo Verde’ (Doctoral dissertation).

Shulruf, B., Bagg, W., Begun, M., Hay, et al (2018). ‘The efficacy of medical student selection tools in Australia and New Zealand.’ Medical Journal of Australia, 208(5), pp 214-218. https://doi.org/10.5694/mja17.00400

Sladek, R. M., Bond, M. J., Frost, L. K., and Prior, K. N. (2016). 'Predicting success in medical school: a longitudinal study of common Australian student selection tools.’ BMC Medical Education, 16(1),187. https://doi.org/10.1186/s12909-016-0692-3

Welter, G. M. R. (2007). 'O BBT: Teste de Fotos de Profissões em Adultos e Adolescentes.’ Revista Brasileira de Orientação Profissional, 8(1), pp 45-58.

Woodward, A., Thomas, S., Jalloh, M. B., Rees, J., et al (2017). ‘Reasons to pursue a career in medicine: a qualitative study in Sierra Leone.’ Global Health Research and Policy, 2(1), pp 34. https://doi.org/10.1186/s41256-017-0054-7
Appendices

None.

Declarations

The author has declared that there are no conflicts of interest.

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Ethics Statement

The study was authorised by the deputy director for academic affairs of the Agostinho Neto University (UAN) Faculty of Medicine. The study was approved by the Ethics Committee of the UAN Medical School - Resolution Number 00121A/2012. The study participants were informed about the data collection procedures, and their anonymity in the research, and signed the consent form to participate. The identity of the participants remains confidential and the information collected has solely been used for the purposes of the study.

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