Selection of Medical Students and non-cognitive skills: A national, longitudinal written-test validation study

Authors: Claudio Barbaranelli (1), Gabriele Cavaggioni (1), Maria Grazia Strepparava (2), Andrea Lenzi (1), Giuseppe Familiari (1)

Institutions: (1) Sapienza University of Rome, Rome, Italy, (2) Milano-Bicocca University, Milan, Italy

BACKGROUND

Universities worldwide use entry tests to assess both the cognitive and 'non-cognitive' skills of undergraduate medical-school (UMS) applicants (1). In Italy, current UMS assessment procedures test applicants' cognitive skills only. These tests are partly focused on curricular topics (such as physics, biology, chemistry and mathematics), and partly on extracurricular mental abilities (problem solving, verbal and numerical reasoning, reading comprehension). No attempt has ever been done in Italy to include, for UMS applicants, the assessment of non-cognitive dimensions such as personality, attitudes, motivations, interests.

Aims of the research

The main aim of this research was to investigate the impact on the academic and professional outcomes of different non-cognitive dimensions measured on medical school students.

The recognition of the importance of these characteristics would eventually lead to a better recognition and assessment of the aptitude the candidates show regarding medicine academic career as well as professional career.

This would eventually lead to a better selection of the applicants, a selection where curricular-"in role" skills and knowledge are supplemented by "extra-role" non-cognitive dimensions.

In our opinion, this integrated approach would help not only the quality of academic training, contributing, among others, to the decrease of the drop-out and then of the latency between the end of high school and the entrance in the work-market, but also to the improvement of the quality of the profession. Non-cognitive "extra-curricular" skills are in fact an essential part of the medical professional capabilities (2).

SUMMARY OF WORK

The Italian Permanent Conference of Medical School Directors promoted this research (3) to validate a multi-dimensional instrument capable of identifying non-cognitive MS success predictors. The research involves six public Universities from the South (Palermo-Caltanissetta, and Foggia), Centre (Rome and Chieti) and North of Italy (Milano and Pavia). The research follows a longitudinal design, where participants will be examined at different stages of their undergraduate careers, as well as followed two years after their graduation. In particular, 4-time-points will be considered during the medical school career.

Sample size and distribution for University

This questionnaire was administered to 919 Medical School fresh-men during the current year.

The following table presents a breakdown of the number of participants collected in the three regional zones.
SUMMARY OF RESULTS

This poster will refer to the data that we are collecting in this first year of the research. As we noted before to the participants were administered a questionnaire comprising personality and self-efficacy; psychological well-being; motivational and vocational factors; socio-demographic variables. On the data collected this year we are planning to perform the following statistical analyses:

- a) descriptive statistics to examine the distributions and the presence of univariate and multivariate outliers
- b) multivariate analyses (exploratory factor analysis) for examining the dimensionality of the scales
- c) reliability analyses (Cronbach alphas and item-total corrected coefficients) to examine the impact of measurement error

Focused analyses will be also performed on the SCL-90 scale for individuating those students presenting a profile that would suggest clues of psychological difficulties

in order to address them to counseling interventions. Considering that the risk of psychotic break down has a peak at 24 years and the prodromes are also seen five years before onset, intervene in a population of students who have risk areas, is to contribute to the promotion mental health, combat stigma towards psychiatry and mental illness, and operate in the prevention.

At the beginning of the second year of course (November 2014 - February 2015) data from records of examinations will be available from the administrative services who manage students academic careers. Then it will be possible to analyze the differential impact of the questionnaire variables as well as of the grades obtained at the end of the high school and of the scores in the UMS assessment test on the grades obtained in the exams, as indicators of academic achievement. This analysis will be performed in the framework of structural equation modeling (11).

The 4-5 time points longitudinal data will allow the research group:

- a) to identify different developmental trajectories on the variables that are object of study
- b) to identify different clusters of developmental patterns
- c) to identify the variable that act as protective and as risk factors regarding personal well-being as well as academic achievement

CONCLUSION
Validated scales for measuring extra-curricular dimension such as personality, motivation, attitudes, may act as predictors of the aptitudes of future medical students, and allows the study of their profiles and the assessment over the six years course, to identify risk and protective factors for their academic career as well as their professional development. The results, which compare changes in interpersonal and intrapersonal competencies during the students’ careers, may be useful when selecting non-cognitive/extra-curricular constructs to be considered in national UMS tests.

**TAKE-HOME MESSAGES**

This initiative aims at changing the ways medical school applicants are assessed and selected in order to identify those who will become the kind of physicians best suited to practice in a dynamic healthcare environment. The integrated pre-validated items may be important predictors of attitudes of future medical students.

**ACKNOWLEDGEMENT**

We gratefully acknowledge the Italian Permanent Conference of Medical School directors and Proff. M.F. Ciaiaffa (Foggia), I. Di Liegro (Palermo), P. Furlan (Torino), M. Penco (L’Aquila), A. Lanzaone (Roma), S. Morini (Roma), R. Muraro (Chieti), M. Vai (Pavia)

**REFERENCES**


(9) Caprara, GV; Alessandri, G; Eisenberg, N; Kupfer, A.; Steca, P; Caprara, MG; Yamaguchi, S; Fukuzawa, A; Abela, J. (2012). The Positivity Scale. Psychological Assessment, Vol 24(3), 701-712
