Absence of moral competence development in medical students: A cross-sectional study in two countries

Sunčana Kukolja Taradia, Milan Taradia, Zoran Ðogašb, & Georg Lindc

a*University of Zagreb, Croatia*; b*University of Split, Croatia*; c*University of Konstanz, Germany*

**Corresponding author**:   
\* Sunčana Kukolja Taradi, *Department of Physiology,* *University of Zagreb School of Medicine   
Šalata 3, 10 000 Zagreb, Croatia*

Email: [skukolja@gmail.com](mailto:skukolja@gmail.com)

Milan Taradi, *Department of Physiology,* *University of Zagreb School of Medicine, Šalata 3, 10 000 Zagreb, Croatia*

Email: milan.taradi@gmail.com

Zoran Ðogaš*, Department of Neuroscience, University of Split School of Medicine, Šoltanska 2, 21 000 Split, Croatia*

Email: zdogas@gmail.com

Georg Lind, *Department of Psychology*, *University of Konstanz, Schottenstrasse 65, 78462 Konstanz, Germany*

Email: georg.lind@uni-konstanz.de

**Funding:** This work was supported by Ministry of Science, Higher Education and Sports, Republic of Croatia [grant number 108-1080314-0276].

**Competing interests:** None.

**Word count**: 3383

**Number of tables**: 5

**Acknowledgements**: The authors gratefully acknowledge students from all five medical schools in Croatia and Bosnia and Herzegovina who participated in this study. We also thank Professor Pavo Filaković (University of Osijek School of Medicine), Professor Stella Fatović Ferenčić (University of Osijek School of Medicine), Professor Vlasta Rudan (University of Zagreb Medical School), Professor Darko Antičević (University of Zagreb School of Medicine), Professor Gordana Pavleković (University of Zagreb School of Medicine, Andrija Štampar School of Public Health), Professor Mladenka Vrcić-Keglević (University of Zagreb School of Medicine, Andrija Štampar School of Public Health), Luka Brčić, MD, PhD (University of Zagreb School of Medicine), and Ksenija Baždarić (University of Rijeka School of Medicine) for collecting the data. For entering data in spreadsheet we thank Lidija Kozjek (University of Zagreb School of Medicine) and Ivana Pavlinac (University of Split School of Medicine).

Absence of moral competence development in medical students: A cross-sectional study in two countries

**Abstract**

The profession of medicine requires a very high level of moral competence. Yet, in the last two decades, many studies from different countries showed that medical education hinders students' moral development. In a cross sectional study, we used Lind's Moral Competence Test to score moral competence of students in different study years at all four medical schools in Croatia and one medical school in Bosnia and Herzegovina, including a group of faculty members from one Croatian medical school (*N* = 1136). Results revealed that the moral competence of medical students, regardless of county or/and institution, showed no progress across study years. The failure of medical education to promote students’ moral competenciescalls for deep reflection to re-evaluate the curriculum and implement new methods of fostering moral competence.

*Keywords:*moral competence, moral development, moral education, medical students, medical education

**Introduction**

Morality is a natural and a cultural phenomenon which develops through the interplay of psychological components of an individual, and through the interactions of people within a society (1).It directs behaviour that affects others with the intent to lessen evil or harm (2). Moral judgement is the fundamental psychological structure by which individuals make decisions about their rights and responsibilities (3).Lawrence Kohlberg defined moral competence as the capacity to make moral judgements and decisions accordingly to one’s personal values (4). Based on Habermas's (5) definition of moral competence as the ability to solve conflicts by free discourse instead of violence, Georg Lind extends the definition to include social situation: it is the capacity to resolve disagreements on the basis of shared moral principles through thinking and discussion rather than through violence, deceit, and power (6).Moral competence is a persisting human trait, while judgement is an ephemeral phenomenon (7). An implicit assumption prevails in the literature that moral judgement competence is positively related to moral behaviour (8, 9, 10, 11, 12). Studies have shown that students with low level of moral development tend to cheat on tests, and tend to withhold help for people under duress (13, 14, 15). Since moral competence is not inborn, it must be learned and education needs to foster its development (16, 17, 18).If people are confronted with moral dilemmas, but do not know how to solve them reasonably, they will have no choice but resort to low levels of conflict resolution like violence, deceit and power (19, 20, 21).

The profession of medicine requires a very high level of moral competence and moral behaviour. Medical students frequently encounter ethical issues in their training, but lack the sensitivity to resolve these dilemmas (22). Therefore, fostering moral competence of medical students should be the central focus of medical education (23, 24).But research does not confirm the hypothesis that medical education fosters students moral development. In the last two decades, many studies from different countries all over the world, using different research instruments, revealed disturbing data: medical education hinders students' moral development or even attenuates it (25, 26, 27, 28, 29). Recent studies in Croatia also evidenced regression of moral reasoning in medical students measured by Rest’s Defining Issues Test (27) and reported high cheating prevalence at Croatian medical schools where academic dishonesty became an acceptable behaviour (30, 31).It seems that regression of moral reasoning in students during medical education is a global phenomenon that critically mines the foundations of medical education (26).

Moral judgement can be measured by a number of tests of which the most famous are Rest’s Defining Issues Test (DIT) (3), Kohlberg’s Moral Judgement Interview (MJI) and its modification (32), Gibbs’ Sociomoral Reflection Measure (SRM) (33), and Lind’s Moral Competence Test (MCT, formerly known as Moral Judgement Test) (7). The DIT measures moral attitudes, i.e. preference for principled moral reasoning. Although it does not confront the participants with a moral task and, therefore, is not tapping a competence, it measures moral competence indirectly because the strength of moral orientations is highly correlated with moral competence (7). The MJI measures moral judgement competence and moral attitudes, the SRM explores mainly moral attitudes and partly moral judgement competence, and the MCT measures mainly moral competence based on consistency of rating for all groups of stage-typed items rather than a preference for a specific stage, and moral attitudes (similar to DIT and MJI).

The main aim of our study was to better understand, not only the affective aspect of moral preference, but also the cognitive aspect of moral behaviour, particularly the development of moral competence of medical students and to suggest ways of improving medical education. The distinction between the cognitive and affective aspect is important because competencies cannot be faked upward while attitudes can usually be simulated in any direction. For this reason we used Lind's MCT that lets us simultaneously measure the two aspects of moral judgment behaviour. We wanted to find out whether in our sample, we would find the similar trend of stagnation of moral competence as in other countries, and how this stagnation (if present) was related to the students' place of study, study year, gender, grade point average, religious background, parents' educational attainment, and participation in ethics or catechism courses during high school education. Here we report the findings from five medical schools in Croatia and Bosnia and Herzegovina.

**Methods**

We collected data from anonymous paper-and-pencil tests distributed after regular classes. The research was approved by the Ethics Committee of the University of Zagreb School of Medicine.

**Study setting and participants** Participants in our study were medical students from Croatia and Bosnia and Herzegovina and young medical teachers from Croatia. For visualising moral development, we compared students cross-sectionally, that is first-, third- and fifth-year students at all four Croatian medical schools, and students in their first and fifth/sixth study year at Mostar University Medical School which is the only Croatian language university in Bosnia and Herzegovina. The Mostar Medical School is one of five medical schools in Bosnia and Herzegovina with a great number of teachers coming from the four Croatian medical schools (34).

**Measurement of moral competence** For the measurement of moral competence we used the validated and certificated Croatian translation of the standard version of Lind's MCT (19, 35).

The test confronts participants with a doctor's and a workers' dilemma-story and 12 arguments for each story (36). Firstly, participants are asked to express (dis)agreement with the protagonists' solution of their dilemma. Then they are asked to rate six statements arguing in favour and six against the protagonist's decision. Each argument represents a different type of moral reasoning as defined by Kohlberg (13). They have been checked for theoretical validity through expert ratings (19). The participants rate the arguments on a 9-point scale ranging from –4 (strongly reject) to +4 (strongly accept). For scoring, each individual pattern of responses (to the altogether 24 items) is analysed using intra-individual, multi-variate analysis of variance components. The C-score is the sum of square due to the moral quality of the arguments, divided by the individual's total sum of square, and multiplied by 100. A C-score of zero indicates that the participant failed to recognize the moral quality of the arguments, while a C-score of one hundred means that he/she has rated the arguments exclusively with respect to their moral quality. Thus, the C in the C-score stands for competence, not for consistency as is often wrongly assumed. There is no consistency *per se,* but only consistency in regard to some behavioural standard, norm or principle.

In addition to measuring moral competence, the MCT simultaneously measures the other basic aspect of moral judgment behaviour, namely the moral orientation. As indices for moral orientation, the summated responses to the arguments (designed to represent one of the Kohlberg's six stages of moral development) are used (13). Thus, six measures are produced which are usually depicted as profiles. Both scores are constructed in such a way that they are logically independent from one another. This means that the participant does not need to agree with the test-maker on the preferred moral orientation (like in Kohlberg's MJI) in order to get a high C-score, but is free to prefer any type of moral reasoning. Pure preference for certain stages of moral reasoning only address their moral attitudes, while the C-score is logically independent of a person’s moral ideology.

Also, the MCT allows to calculate the score for the phenomenon of „moral segmentation“, when participants show a significantly higher C-score in the Workers' Dilemma than in the Doctor's Dilemma, which deals with the problem of euthanasia (7, 19, 37, 38).

**Demographic data** In addition, we also assessed participants' self-reported age, study year, gender, grade point average, parents' educational attainment, religious orientation, and participation in ethics or catechism courses during high school education.

**Statistical analysis** We used two approaches to assess the magnitude of the effects. Besides tests of statistical significance (Chi-square test, one-way analysis of variance), we also used tests of practical significance: standardised effect size Cohen’s *d* (*d* values > 0.5 were considered large, 0.5–0.3 medium, 0.3–0.1 small, and < 0.1 trivial), and measures of effect sizes in units of the MCT.

**Results**

Of the 1835 students enrolled in the first, third and fifth study year at all four Medical Schools in Croatia, 1004 Moral Competence Tests were fully completed (55%) and used for the purpose of this study. In Mostar Medical School (Bosnia and Herzegovina) 125 students were enrolled in the first, and fifth/sixth study year, of which 94 tests were valid for further study (75%). We also tested 50 medical teachers at the Zagreb Medical School, of which 38 tests were entirely filled out (76%). Table 1 depicts the demographic characteristics of the sample.

**Moral competence** Overall, the cross-sectional comparison of students in different study years showed no increase of moral competence (Table 2). The C-scores of students in the Mostar Medical School (Bosnia and Herzegovina) even showed a regression: their average C-score was higher in the first year than in the last study years (4.6 points; *d* = 0.38).

**Medical schools** C-scores of participants in all three groups were of medium size (Table 1). Medical students in Croatia scored, on average 4.3 points higher than their colleagues in Bosnia and Herzegovina (*d* = 0.34) (Table 1)*.* When comparing C-scores of students from each medical school separately, the highest difference was between the students of the Medical School in Zagreb and Mostar (5.5 points; *d* = 0.41) (Table 3).The difference between the freshmen groups from the two countries was trivial***,*** whereas fifth year medical students in Croatia scored higher for about 6.0 points than their peers from Bosnia and Herzegovina (*d* = 0.47) (Table 2).

**Moral segmentation** A small degree of moral segmentation occurred only in Mostar students who scored, on average 3.7 points higher on the Workers' dilemma than on the Doctor's dilemma (*d* = 0.40) (Table 1). When analysed by study years, Mostar students in the 5th study year scored, on average 5.0 points higher on the Workers' dilemma than on the Doctor's dilemma (*d* = 0.50) (Table 2).

**Religious orientation** Attending catechism courses, instead of ethics courses, had a small negative treatment effect on the development of students´ moral competence (*d* = -0.22) (Table 2). Participants who attended catechism courses achieved a mean C-score (*M* = 16.9, *SD* = 12.9) that was about 3.1 points lower than their peers who took ethics courses (Table 4). Religious believers scored, on average 3.8 points lower in comparison to their non religious peers (*M* = 16.9, *SD* = 12.9). The calculated effect size of this intervention was small (*d* = -0.28) (Table 2). However, when religious orientation and the courses were combined, a stronger correlation showed up: agnostic students who took ethics courses had a markedly higher C-score (*M* = 23.4, *SD* = 14.1) than students with religious orientation who said that they have taken catechism education (*M* = 16.7, *SD* = 12,9.1) (Table 4). The calculated medium effect size (*d* = 0.50) indicated that the C-score of agnostic students who attended ethics courses was at the 69th percentile of the religious student group who attended catechism.

**Parents educational attainment** Parents' level of education had a medium correlation with the students´ level of moral competence (*d* = 0.45) (Table 2). Students, whose one or both parents attained university education or Ph.D. (*n* = 143), achieved a mean C-score (*M* = 19.1, *SD* = 14.1) that was about 5.6 points higher compared to their peers whose parents (one or both; *n* = 34) attained a lower level of education.

Having a medical doctor among close family relatives seems to make no difference in regard to students' moral competence (Table 2).

**Gender and grade point average** Whereas no gender effect showed up in our data (*d* = 0.04), a higher grade point average showed a small relative effect size on the development of students' moral competence (*d* = 0.19) (Table 2).

**The extremeness of opinion** We found that students' opinions were more extreme on the doctor's euthanasia decision than on the workers' decision. The extremeness of opinion was negatively correlated with moral competence. Students who extremely disagreed with the doctor's opinion had a lower mean C-score (11.1 in Croatia; 8.5 in Bosnia and Herzegovina) than students who moderately disagreed (15.3 in Croatia; 12.1 in Bosnia and Herzegovina) or moderately agreed (21.7 in Croatia; 19.1 in Bosnia and Herzegovina). These differences were highly significant as determined by the one-way unweighted ANOVA *F*(2;566) = 30.25; *p* < .001 (Table 5).

**Discussion**

Our results showed that the study of medicine, regardless of country and medical school, did not promote the development of moral competence in students. C-scores of students in Croatia remained unchanged across study years, and those of their peers in the Mostar Medical School (Bosnia and Herzegovina) showed a tendency to decline, suggesting that the educational experience somehow shackled their moral judgement ability rather than facilitated it. These findings are in agreement with similar studies conducted in medical schools in Brazil, Germany, Finnland, Australia, Portugal, Czech Republic, and in Iran (18, 29, 37, 39, 40, 41, 42). They contrast with studies of other disciplines whose moral competence increases while progressing through university studies (17, 18).

As moral competence is not inherent, it has to be learned. Therefore the learning environment needs to foster its development (16, 17, 18). If a society creates a favourable learning environment, then moral judgement competence can develop by itself to a certain degree (18). For students who participated in our study did not develop their moral competencies during the study of medicine, it seems that the learning environment was not favourable enough to further improve it. Unfortunately, both countries studied here are extremely burdened with heavy political and economic problems which undoubtedly penetrate into all aspects of life, including the educational environment (27, 30).Socioeconomic structures of Croatia and Bosnia and Herzegovina have dramatically changed in the past two decades: both countries are rather young democracies that recently experienced a bloody war. Croatia is a morally conservative country where almost 90% percent of the population of 4.4 million say they are Roman Catholic (43). Croatian society struggles between competing secular socialist and dogmatic religious ideologies (44).The socioeconomic situation in Bosnia and Herzegovina is even more complex than in Croatia. The Medical School in Mostar is part of the University of Mostar which is the only Croatian language university in Bosnia and Herzegovina with prevalent students of Croatian nationality (45). In such circumstances, it is valid to assume that the expected 'natural' development of moral competencies may not be sufficient and must be additionally stimulated by appropriate education (18).

There is suggestive evidence that the intellectual milieu, as indicated by region of the country and religious membership is associated with moral judgement (3). Religious people are more likely to hold cultural conservative and authoritarian beliefs and are more likely to base important choices in life on the expectations of authority figures or reference groups (46). According to our findings, it seems that religious orientation combined with catechism or ethics education affected students moral judgement competence: agnostic students who took ethics courses achieved the highest C-scores, conversely believers with catechism education scored the worst. Besides, students raised in university-educated families demonstrated higher moral competencies than their colleagues whose parents had lower levels of education. We evidenced that the percentage of students in both countries who totally disagreed with the practice of euthanasia in the Doctor’s dilemma was significantly higher than the percentage of students who extremely disagreed with the Workers’ dilemma. It has been shown that this phenomenon is related to the dogmas of various churches that forbid mercy killing (38, 40). Because the problem of euthanasia is highly sensitive in staunchly religious nations, decision-making is not based on critical and independent thinking, but is based on prescribed and unquestioned beliefs (3). Thus, ideological commitments can override conceptual adequacy in making moral judgements. In other words, people suppress their moral judgment competence when moral issues like euthanasia are at stake.

Since students of disciplines other than medicine actually do improve their moral competence while progressing through university studies, in addition to socioeconomic reasons, some studies link students moral stagnation/regression to the design of medical education (28, 29, 37, 39).The rule-based, factual approach and the increasing focus on adherence to guidelines during medical school may limit the higher thought needed to develop moral competence (47). In addition, medical students are too often overwhelmed by an overloaded curriculum. The resulting desperate lack of time during medical training has a number of consequences for moral competence development (48).It seems that medical schools train their students to handle in particular the scientific and technical aspects of the profession but do not provide sufficient opportunities to practice thinking and discussion. It looks like there is a hidden curriculum in the structure of medical education that prevents rather than fosters the development of moral judgement competencies (27, 49, 50). In our sample, we did not evidence a significant difference in moral judgement competence among medical students and their teachers. Teachers at low moral competence level view their role as controlling and policing (51, 52). The question arises, how virtuous can a medical teacher be as a moral role model if he/she thinks about moral issues at the level of freshmen?

Under described circumstances, it may be too difficult to radically change the curriculum of medical education on such a scale that its effects on the development of students’ moral competencies become noticeable. However, data support that the medical practice can be improved by interventions (14, 53, 54). Students need at least some opportunity for responsibility-taking for moral competence to develop (14). Studies indicate that medical education mostly does not provide even a minimum of such opportunities to its students (14, 18, 19, 20, 21). It seems that already a small number of such opportunities suffice to stimulate and support the growth of their moral competence. A promising way may be to introduce effective interventions into medical education, like the Konstanz Method of Dilemma Discussion (KMDD) (55). One or two KMDD session of 90 minutes per academic year seems to have a strong impact on students' moral competence development. This method is already used in institutions of medical education in Mexico, Chile and Brazil. For that purpose, medical teachers need to be taught how to apply the KMDD, and develop, thereby, a higher level of moral competence themselves.

There are limitations associated with this study. It is a cross-sectional assessment and a longitudinal study would enable to distinguish short from long-term phenomena and provide additional data to determine the potential impact of the medical school environment on the moral competence development of its students. The sample in Bosnia and Herzegovina was obtained from just one school of medicine within a given region and thus generalisation may be limited to that region. Also, the sample size of medical teachers was relatively low. Still, it may be considered adequately representative because it was a randomised group of young medical teachers of different specialities, and from different Croatian medical schools who attended an obligatory teacher training course at the Medical School in Zagreb, and because the response rate was sufficiently high (76%).

**Conclusion**

The results of this study add to the literature on the global phenomenon of the failure of medical education to promote moral competence in medical students. The observed stagnation in moral competence among medical students calls for deep reflection by teachers and university administrators to reevaluate the curriculum and implement changes in their teaching. Since studies show that malpractice is connected with low scores on moral development scales (24, 28), we have the responsibility to contribute in any way we can to the moral development of our students. We need to find innovative ways of fostering students moral and democratic competencies, for example by implementing the highly effective Konstanz Method of Dilemma Discussion which is in use for more than 20 years and its effect size exceeds any other program (56, 57, 58).The challenge will be to develop a curriculum that will enable students to increase their moral competence by allowing them to participate in making decisions, taking responsibility and critical reflection.

**References**

1. The New Science of Morality—Consensus Document. Edge—The Third Culture. [Internet].2010 Jun 20[cited 2015 Oct 2]. Available from: http://www.edge.org/3rd\_culture/morality10/morality\_consensus.html
2. Gert B. The Definition of Morality. The Stanford Encyclopedia of Philosophy (Fall 2012 Edition) [Internet].2011 Mar 14[cited 2015 Oct 2]. Available from: http://plato.stanford.edu/archives/fall2012/entries/morality-definition
3. Rest JR. *Development in Judging Moral Issues*. Minneapolis, Minnesota: University of Minnesota 1979:17–47
4. Kohlberg L. Development of moral character and moral ideology. In: Hoffman ML, Hoffman LW (eds). *Review of Child Development Research*. New York: Russell Sage Foundation; 1964:381–431.
5. Habermas J. *Moral consciousness and communicative action*. Cambridge, MA: The MIT Press; 1990.
6. Lind G, Nowak, E. Kohlberg’s unnoticed dilemma – The external assessment of internal moral competence?. In: Zizek B, Garz D, Nowak E. (eds). *Kohlberg Revisited*. Rotterdam: Sense Publisher; 2014.
7. Lind G. 35 Years of the Moral Judgment Test – Support for the Dual-Aspect Theory of Moral Development. In: Hutz CS, de Souza LK. (eds). *Estudos e pesquisas em psicologia do desenvolvimento e da personalidade: uma homenagem a Angela Biaggio*. Sao Paulo, Brasil: Casa do Psicólogo; 2013:143–170.
8. Ketefian S. Moral reasoning and moral behavior among selected groups of practicing nurses. *Nurs Res*. 1981 May-Jun;30(3):171-6.
9. Arnold DF, Ponemon LA. Internal auditors' perceptions of whistle-blowing and the influence of moral reasoning: an experiment. *Auditing - a Journal of Practice & Theory*. 1991 Fal;10(2):1-15.
10. Brown ME, Trevino LK. Ethical leadership: a review and future directions. *Leadership Quarterly*. 2006 Dec;17(6):595-616.
11. Loviscky GE, Trevino LK, Jacobs RR. Assessing managers' ethical decision-making: an objective measure of managerial moral judgment. *Journal of Business Ethics*. 2007 Jul;73(3):263-285.
12. Trevino LK, Weaver GR, Reynolds SJ. Behavioral ethics in organizations: a review. *Journal of Management*. 2006 Dec;32(6):951-990.
13. Kohlberg L. Essays on moral development. In: *The psychology of moral development*, Vol. II. San Francisco, Harper & Row; 1984.
14. Lind G. The importance of responsibility-taking opportunities for self-sustaining moral development. *Journal of Research in Education*. 2000;10:9–15.
15. McNamee S. Moral behaviour, moral development and motivation*. J Moral Educ*. 1977 Jul; 7(1):27–31.
16. Gilligan C. The effects of social institutions on the moral development of children and adolescents. *Bull Menninger Clin*. 1980 Sep;44(5):498–523.
17. Lind G. *Ist Moral lehrbar? Ergebnisse der modernen moralpsychologischen Forschung*. [Can Morality be Taught? Research Findings from Modern Moral Psychology]. Second Edition. Berlin: Logos-Verlag; 2002.
18. Schillinger M. *Learning environments and moral development: How university education fosters moral judgment competence in Brazil and two German speaking countries*. Aachen: Shaker-Verlag; 2006.
19. Lind G. The meaning and measurement of moral judgement competence: a dual-aspect model. In: Fasko D, Willis W (eds). *Contemporary Philosophical and Psychological Perspectives on Moral Development and Education*. Cresskill, NJ: Hampton Press; 2008:185–220.
20. Lind G. Gewalt als die niedrigste Ebene der Konfliktlösung [Violence as the lowest level of conflict resolution]. Ethics in Progress Quarterly. [Internet].2010 [cited 2015 Oct 2]. Available from: http://ethicsinprogress.org/?page\_id=135
21. Hemmerling K. *Morality behind bars - An intervention study on fostering moral competence of prisoners as a new approach to social rehabilitation*. New York: Peter Lang; 2014.
22. Janakiram C, Gardens SJ. Knowledge, attitudes and practices related to healthcare ethics among medical and dental postgraduate students in south India. *Indian J Med Ethics*. 2014 Apr 1;11(2):99-104.
23. Rest JR. Background: theory and research. In: Rest JR (ed). *Moral Development in the Professions: Psychology and Applied Ethics*. Hillsdale, NJ: Lawrence Erlbaum Associates; 1994:1–26.
24. Self D, Baldwin D. Moral reasoning in medicine. In: Rest JR, ed*. Moral Development in the Professions: Psychology and Applied Ethics*. Hillsdale, NJ: Lawrence Erlbaum Associates 1994:147–62.
25. Bebeau M. The Defining Issues Test and the Four Component Model: Contributions to Professional Education. *J Moral Educ*. 2002 Sep;31(3):271-95.
26. Murrell VS. The failure of medical education to develop moral reasoning in medical students. *Int J Med Educ*. 2014 Dec;5:219–225.
27. Hren D, Marušić M, Marušić A. Regression of Moral Reasoning during Medical Education: Combined Design Study to Evaluate the Effect of Clinical Study Years. *PLoS ONE* 2011;6 (3):e17406.
28. Patenaude J, Niyonsenga T, Fafard D. Changes in students' moral development during medical school: a cohort study. *CMAJ*. 2003 Apr;168(7):840–4.
29. Helkama K, Uutela A, Pohjanheimo E, Salminen S, Koponen A, Rantanen Väntsi L. Moral reasoning and values in medical school: a longitudinal study in Finland. *Scandinavian Journal of Educational Research*. 2003 Aug;47(4):399–411.
30. Kukolja Taradi S, Taradi M, Knežević T, et al. Students come to medical schools prepared to cheat: a multicampus investigation. *J Med Ethics*. 2010;36(11):666–70.
31. Kukolja Taradi S, Taradi M, Đogaš Z. Croatian medical students see academic dishonesty as an acceptable behaviour: A cross-sectional multi-campus study*. J Med Ethics*. 2012;38(6):376–79.
32. Colby A, Kohlberg L. *The Measurement of Moral Judgement*, Vol. I. Cambridge, Cambridge University Press; 1987.
33. Gibbs JC, Basinger K, Fuller D. *Moral maturity: measuring the development of sociomoral reflection*. Hillsdale, NJ: Lawrence Erlbaum Associates; 1992.
34. Čulo F. Mostar University Medical School, Bosnia and Herzegovina: First Graduates. *Croat Med J.* 2004 Feb; 45(1):1-7.
35. Lind G. Certified Versions of the Moral Judgment Test (MJT). [Internet].2015 Mar 24[cited 2015 Oct 2]. Available from: http://www.uni-konstanz.de/ag-moral/mut/mjt-certification.htm#certification
36. Lind G. Excerpt of the Moral Judgment Test (Standard Version), p. 7. In: *Scoring of the Moral Judgment Test (MJT).* [Internet].1999[cited 2015 Oct 2]. Available from: http://www.uni-konstanz.de/ag-moral/pdf/Lind-1999\_MJT-Scoring-E.pdf
37. Hegazi I, Wilson I. Medical education and moral segmentation in medical students. *Med Educ*. 2013;47:1022–8.
38. Bataglia P, Schillinger M. Moral segmentation in studies with the Moral Judgment Test in Brazil. In: Nowak E, Schrader D, Zizek B (eds). *Educating competencies for democracy.* Frankfurt am Main: Peter Lang Verlag; 2013:71-82.
39. Lind G. Moral regression in medical students and their learning environment. *Rev Bras Educ Méd*. 2000;24:24–33.
40. Feitosa H, Rego S, Bataglia PU, et al. Moral judgment competence of medical students: a transcultural study. *Adv in Health Sci Educ*. 2013;18:1067–85.
41. Slovackova B, Slovacek L. Moral judgement competence and moral attitudes of medical students. *Nurs Ethics*. 2007;14:320–8.
42. Saeidi-Parvaneh S. *Moral, Bildung und Religion im Iran: Zur Bedeutung universitärer Bildung für die Entwicklung moralischer Urteils- und Diskursfähigkeit in einem religiös geprägten Land*. (Doctoral dissertation), KOPS - Das Institutionelle Repositorium der Universität Konstanz, University of Konstanz, Germany (English Abstract). [Internet]. 2011[cited 2015 Oct 2]. Available from: http://kops.ub.uni-konstanz.de/handle/urn:nbn:de:bsz:352-opus-131079
43. Demographics of Croatia. Wikipedia. [Internet].2015 Sep 26[cited 2015 Oct 2]. Available from: http://en.wikipedia.org/wiki/Demographics\_of\_Croatia#Religions
44. Horvat S. Croatia's vote forbidding gay marriage: a sign of the rotten heart of Europe. *The Guardian*. [Internet].2013 Dec 4[cited 2015 Oct 2]. Available from: http://www.theguardian.com/commentisfree/2013/dec/04/croatia-gay-marriage-vote-europe-rotten-heart#start-of-comments
45. University of Mostar. Wikipedia. [Internet].2015 May 6[cited 2015 Oct 2]. Available from: http://en.wikipedia.org/wiki/University\_of\_Mostar
46. Duriez B, Soenens B. Religiosity, moral attitudes and moral competence: a critical investigation of the religiosity-morality relation. *International Journal of Behavioral Development*. 2006;31(1):75–82.
47. SheehanS, Robbins A, Porter T, Manley J. Why does moral reasoning not improve in medical students? Int J Med Educ. 2015; 6:101-102
48. Andre J. Learning to see: moral growth during medical training*. J Med Ethics*. 1992 Sep;18(3):148–152.
49. Hafferty FW, Franks R. The hidden curriculum, ethics teaching, and the structure of medical education. *Acad Med*. 1994 Nov;69(11):861–871.
50. Lempp H, Seale C. The hidden curriculum in undergraduate medical education: qualitative study of medical students' perceptions of teaching. *BMJ.* 2004 Oct;329(7469):770–3.
51. Johnston M. Lubomudrov C. Teachers' level of moral reasoning and their understanding of classroom rules and roles. *The Elementary School Journal*. 1987;88(1):64–77.
52. Mccallum JA. Teacher reasoning and moral judgment in the context of student discipline situations. *J Moral Educ*. 1993;22(1):3–17.
53. Bebeau MJ. Influencing the Moral Dimensions of Dental Practice. In: Rest JR (ed). *Moral Development in the Professions: Psychology and Applied Ethics*. Hillsdale, NJ: Lawrence Erlbaum Associate; 1994:121–44.
54. Maeda Y, Thoma SJ, Bebeau MJ. Understanding the relationship between moral judgment development and individual characteristics: The role of educational contexts. *Journal of Educational Psychology*. 2009 Feb;101(1):233-247.
55. Lind G. Moral education: Building on ideals and fostering competencies. *Contemporary Issues in Education*. 2011;2(1):45–59.
56. Lind G. Teaching students to speak up and to listen to others: Cultivating moral democratic competencies. In: Lund DE, Carr PR (Eds). *Doing democracy and social justice in education: Political literacy for all students*. New York: Peter Lang Publishing; 2008:319-35.
57. Lind G. Konstanz Method of Dilemma Discussion. Fostering Moral-Democratic Competence with the KMDD® [Internet].2015 May 9[cited 2015 Oct 2]. Available from: http://www.uni-konstanz.de/ag-moral/moral/dildisk-e.htm
58. Nowak E, Schrader DE, Zizek B (eds). *Educating Competencies for Democracy*. Frankfurt am Main, Berlin, Bern, Bruxelles, New York, Oxford, Wien: Peter Lang Publishing; 2013.

Table 1. Descriptive characteristics of the three sample groups, their C-scores for the total MCT and for each dilemma separately

**Medical students**  **Medical teachers**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | All Medical Schools  (Croatia)  *n* = 1004 | |  | Mostar Medical School (Bosnia and Herzegovina)  *n* = 94 | | |  | Zagreb Medical School  (Croatia)  *n* = 38 | | |  |
| **Study variables** |  | |  | | |  |  | | |  |  | | |
| Age  (*M*) | | 22 | |  | 21 | | |  | 39 | | |  | | |
| Female  (%) | | 70 | |  | 62 | | |  | 72 | | |  | | |
| Grade point average (scale 1 – 5) | | 4.3 | |  | 4.1 | | |  | 4.1 | | |  | | |
| Religious believers (%) | | 85 | |  | 92 | | |  | 76 | | |  | | |
| Catechism course  (%) | | 76† | |  | 89† | | |  | – | | |  | | |
| Parents with higher education (%) | | 44 | |  | 37 | | |  | 55 | | |  | | |
| Doctor in close family (%) | | 24 | |  | 21 | | |  | 30 | | |  | | |
| **C-score** |  | |  | | |  |  | | |  |  | | |
| Total  *M* (*SD*) | | 17.9 (13.5)§ | |  | 13.6 (12.2)§ | | |  | 15.9 (9.7) | | |  | | |
| Doctor's dilemma  *M* (*SD*) | | 14.2 (10.1)¶ | |  | 9.7 (10.0)‡ ¶ | | |  | 14.6 (11.1) | | |  | | |
| Workers' dilemma  *M* (*SD*) | | 14.2 (11.1) | |  | 13.4 (9.7)‡ | | |  | 13.0 (8.6) | | |  | | |

All percentages are rounded off to the nearest whole number.

† Chi-square = 7.7; *p* < .01

¶ Cohen’s *d* = 0.45

‡ Cohen’s *d* = 0.40

§ Cohen’s *d* = 0.34 Table 2. Descriptive characteristics and C-scores of students (*n* = 1098) across study years; *n* (%)   
or *M* (*SD*). Effect sizes were computed as Cohen's *d* where a positive effect size represents C-score improvement and a negative effect size represents C-score decrement.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **All Medical Schools  (Croatia)** | | | | **Mostar Medical School   (Bosnia and Herzegovina)** | | **All participants** | | |
|  | 1st study year  (*n* = 415) | 3rd study year  (*n* = 370) | 5th study  year (*n* = 219) | 1st study  year (*n* = 49) | 5 th/6th study year  (*n* = 45) | **Effect size** | | |
| **Study variables** |  |  |  |  |  | **Study variables** | *d* |  |
| Age (*M*) | 19 | 21 | 24 | 19 | 23 | Age | 0.06 |  |
| Female (%) | 69 | 68 | 75 | 67 | 58 | Female | 0.04 |  |
| Grade point average (scale 1 – 5) | 4.8 | 4 | 3.9 | 4.5 | 3.7 | Grade point average | 0.19 |  |
| Religious believers (%) | 85 | 83 | 88 | 90 | 84 | Religious believers | -0.28 |  |
| Catechism course (%) | 79 | 71 | 79 | 90 | 89 | Catechism course | -0.22 |  |
| Parents with higher education (%) | 48 | 49 | 44 | 47 | 27 | Parents with higher education | 0.45 |  |
| Doctor in close  family (%) | 22 | 24 | 27 | 27 | 16 | Doctor in close family | 0.00 |  |
| **C-score** |  |  |  |  |  |  |  |  |
| Total  *M* (*SD*) | 18.1 (13.3) | 18.0 (13.7) | 17.2 (12.7) § | 15.8 (10.6) \* | 11.2 (13.4) \* § |  |  |  |
| Doctor's dilemma  *M* (*SD*) | 14.6 (10.7) | 14.1 (9.6) | 13.9 (9.5) ‡ | 11.0 (9.4) † | 8.3 (10.7) † ‡ ¶ |  |  |  |
| Workers' dilemma  *M* (*SD*) | 14.7 (11.0) | 13.7 (11.3) | 13.9 (11.0) | 14.0 (9.7) | 13.3 (9.8) ¶ |  |  |  |

All percentages are rounded off to the nearest whole number.

\* Cohen’s *d* = 0.38

† Cohen’s *d* = 0.27

‡ Cohen’s *d* = 0.56  
§ Cohen’s *d* = 0.47

¶ Cohen’s *d* = 0.50

Table 3. C-scores of students from the five medical schools associated with mutual effect sizes   
(Cohen’s *d*)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | **Medical Schools (Cohen’s *d*)** | | | |
|  | C-score  *M* (*SD*) | **Zagreb** | **Rijeka** | **Osijek** | **Split** |
| **Zagreb** | 19.1 (14.3) | – | – | – | – |
| **Rijeka** | 17.8 (13.4) | 0.09 | – | – | – |
| **Osijek** | 16.1 (12.2) | 0.22 | 0.13 | – | – |
| **Split** | 15.0 (11.1) | 0.32 | 0.23 | 0.12 | – |
| **Mostar** | 13.6 (12.2) | 0.41 | 0.33 | 0.26 | 0.12 |

Table 4. C-scores of religious, agnostic, and atheist students depending on their attendance of catechism or ethics courses during high school with interrelated effect sizes (Cohen’s *d*)

**C a t e c h i s m E t h i c s**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | *n* | C-score  *M* (*SD*) | **1** | **2** | **3** | **4** | **5** |
|  | **C a t e c h i s m** | 830 | 16.9 (12.9) |  | Cohen’s *d* | | |  |
| **1** | Believers | 775 | 16.7 (12.9) | – | – | – | – | – |
| **2** | Agnostics | 30 | 19.4 (12.9) | 0.21 | – | – | – | – |
| **3** | Atheists | 25 | 20.7 (12.4) | 0.32 | 0.10 | – | – | – |
|  | **E t h i c s** | 239 | 20.0 (15.6) |  |  |  |  |  |
| **4** | Believers | 139 | 18.9 (15.4) | 0.15 | 0.03 | 0.12 | – | – |
| **5** | Agnostics | 36 | 23.4 (14.1) | 0.50 | 0.30 | 0.20 | 0.30 | – |
| **6** | Atheists | 64 | 20.4 (16.0) | 0.25 | 0.07 | 0.02 | 0.10 | 0.20 |

Table 5. Distribution of students' opinions on each dilemma separately with associated C-scores

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Students** | **All Medical Schools  (Croatia)** | | | | **Mostar Medical School  (Bosnia and Herzegovina)** | | | |
|  | *Doctor's dilemma* | | *Workers' dilemma* | | *Doctor's dilemma* | | *Workers' dilemma* | |
| Opinion\* | % | C-score *M* (*SD*) | % | C-score *M* (*SD*) | % | C-score *M* (*SD*) | % | C-score *M* (*SD*) |
| –3 | 17 † | 11.1 (11.9) | 3† | 15.2 (15.9) | 19‡ | 8.5 (8.5) | 5‡ | 7.9 (7.9) |
| –2; –1 | 25 | 15.3 (12.0) | 20 | 19.6 (15.4) | 27 | 12.1 (9.2) | 11 | 9.3 (8.2) |
| 0 | 16 | 21.1 (13.7) | 16 | 19.3 (13.0) | 30 | 14.4 (13.2) | 33 | 14.4 (12.6) |
| +1; +2 | 34 | 21.7 (13.7) | 52 | 17.8 (13.0) | 14 | 19.1 (12.0) | 45 | 14.4 (13.8) |
| +3 | 8 | 18.2 (14.1) | 9 | 13.8 (12.4) | 10 | 16.9 (18.3) | 6 | 15.2 (12.0) |

All percentages are rounded of to the nearest whole number.  
\* Opinion on the doctor's and workers' behaviour on a scale from –3 (strongly disagree) to +3 (strongly agree).  
† Chi-square = 78.4; *p* < .0001

‡ Chi-square = 7.1; *p* < .01