ABSTRACT

Purpose Moral orientation can affect ethical decision-making. Very few studies have focused on whether medical education can change the moral orientation of the students. The purpose of the present study was to document the types of moral orientation exhibited by medical students, and to study if their moral orientation was changed after preclinical education.

Methods From 2007 to 2009, the Mojac scale was used to measure the moral orientation of Taiwan medical students. The students included 271 first-year and 109 third-year students. They were rated as a communitarian, dual, or libertarian group and followed for 2 years to monitor the changes in their Mojac scores.

Results In both first and third-year students, the dual group after 2 years of preclinical medical education did not show any significant change. In the libertarian group, first and third-year students showed a statistically significant increase from a score of 99.4 and 101.3 to 103.0 and 105.7, respectively. In the communitarian group, first and third-year students showed a significant decline from 122.8 and 126.1 to 116.0 and 121.5, respectively.

Conclusion During the preclinical medical education years, students with communitarian orientation and libertarian orientation had changed in their moral orientation to become closer to dual orientation. These findings provide valuable hints to medical educators regarding bioethics education and the selection criteria of medical students for admission.

Medical education is expected to be able to cultivate competent doctors with an ability to apply the principles of moral reasoning and decision-making to conflicts within and between ethical, legal and professional issues. Some studies have shown that medical education may enhance the moral reasoning skills of the students. However, Evans proposed the ‘belief-bias dual effect’ of reasoning to highlight the discrepancies between optimal reasoning and actual moral decision. There is a gap between ‘knowing’ and ‘doing’. For example, when a physician is faced with a patient with terminal cancer, intellectually the physician knows he/she must tell the patient the truth, but under the influence of family members or other factors, a physician may decide not to tell the patient the truth. Tsai and Harasym studied the moral decision-making process of clinicians and found that the moral decision is a complex process composed of three components: the doctor’s knowledge (clinical and ethical); moral reasoning skills and attitudes. The term ‘attitude’ refers to the moral value or belief governing the moral justification system that determines the ethical issues of right and wrong. The development of moral value is closely tied to a person’s education process, personal experience, culture and socioeconomic background. Persons with different moral values when making moral decisions show different tendencies: some relied on the social justice principle while others used personal care as the most important factor, a concept of moral orientation pointed out by Gilligan. Some theorists argue that moral orientation, rather than moral reasoning, might be more important in ethical decision-making in medicine.

Bore et al., following Gilligan’s theory, had developed a tool to measure the moral orientation of medical students, known as the moral orientation of justice and care (Mojac) scale. After using Mojac to measure medical students at different levels from different countries, Bore developed a conceptualisation of a libertarian—dual—communitarian dimension of moral orientation. When confronted by a moral dilemma, libertarians will place greater value on the needs of the individuals, communitarians will place greater value on the needs of society and important reference groups, and the dual-oriented will equally value the needs of both the individuals and society. He argued that extreme communitarians and extreme libertarians could be considered for exclusion from the process of selecting medical students on the grounds that their moral orientation is likely to be incongruent with the ethical standards and requirements of the medical context.

Taiwan medical schools accept mostly high school graduates through a highly competitive, heavily science-oriented college entrance examination, which can not screen out those few with extreme moral orientation. We can not expect every medical student to embrace appropriate moral orientation, but our medical education should provide the opportunity to change the moral orientation of those with extreme views. The preclinical medical education stage is especially important for moulding the moral orientation of students because students at this age (18–22 years) exhibit the most flexibility in their learning ability. A proper medical education at this stage will prepare them for the complex clinical situations they will encounter. Some educators believe that moral orientation, like personal trait, is difficult to...
mould educationally, but these outlooks lack empirical proof in the medical context. In contrast with moral reasoning skills for which an abundance of research has been conducted, the medical students’ moral orientation is not well understood because the literature remains dispersed. The purpose of this study was to explore the moral orientation exhibited by medical students, and to study whether their moral orientation is changed after their preclinical medical education.

METHODS

Background

Medical education in Taiwan is a 7-year undergraduate programme, which offers courses in liberal arts, general education and general science in the first 2 years, problem-based learning courses in basic sciences and some clinical sciences in the third and fourth years, clerkship in the fifth and sixth years and internship in the seventh year.

We focused our study on the preclinical period of year 1 to year 4. During years 1 and 2, there were courses on introduction to medical ethics and law that included topics on ethical theory, patient autonomy, clinical dilemmas, professional ethics and social issues. The teaching method depends on the content and purpose, using a different format/method to achieve the purpose. These include formal lectures, small tutorial discussions, movies, role playing, debates, consultation with medical authorities and experts, and visits to the communities, medical practice units, or volunteering at the remote centres. During years 3 and 4, healthcare problems in the problem-based learning curriculum are used as the focus on the teaching of medical ethics. These healthcare problems cover not only topics on basic and clinical sciences, ethical issues are also embedded in these healthcare problems to allow students to focus on medical ethics and moral values as their primary learning objectives. These ethical issues are based on the proposal of Gillion on a core curriculum for medical ethics education with topics such as refusal of treatment, caring for a patient whose prognosis is poor, withholding information from a patient, and obtaining consent if a patient is incompetent.

Participants

Our samples consisted of two cohorts: first-year medical students from four medical schools and third-year students from two medical schools. These two cohorts were followed longitudinally for 2 years from 2007 to 2009. The students were asked to complete a questionnaire on moral orientation at the beginning of their first and third years of medical school and again at the end of their second and fourth years, respectively.

Student volunteers were not compensated for their participation. Neither the general topic of moral orientation nor the specific contents of our study instrument were discussed in their classes. The study was approved by the human and ethical committee of the institution and informed consent was obtained from each participant.

Instrument

The instrument used at each point to measure students’ moral orientation was the Chinese version of the Mojac scale, which consists of three hypothetical situations (dilemmas) with 45 statement items. Respondents read each dilemma and were then asked to choose the answer that most closely reflects their value system and what they believe is appropriate for the statement using a four-point Likert scale (strongly agree to strongly disagree). The tests were administered in pen and paper format, using the optical mark reading answer sheets. The answer sheets were then collected and the data were scanned into spreadsheets for scoring. A libertarian to communitarian score (libcom score) with a potential range from a low of 45 to a high of 180 is generated from the responses to the 45 statement items. Low scores indicate a libertarian orientation, in which great value is given to the needs of individuals; while high scores represent communitarian orientation, the needs and moral expectations of society are highly valued. Mid-range libcom scores indicate a dual moral orientation in which individual and group needs are approximately equally valued. The Mojac scale has demonstrated high internal consistency (Cronbach’s α coefficient of above 0.80) and construct validity among medical school applicants and students in Australia, Israel, Fiji, New Zealand, Scotland and England.

The original English version of the Mojac scale was translated into Chinese, then back translated into English by bilingual persons. Three authors (CSL, KIT and SLC) examined each translated version. Any inconsistencies were resolved by discussion among the three authors.

From December 2006 to December 2007, a pilot study was conducted to assess the reliability and validity of the Chinese version of Mojac scale in 745 medical students from four Taiwan medical schools. The Cronbach’s α coefficient and test—retest reliability were 0.84 and 0.8, respectively (KI Tsou, unpublished data, 2010). Previous studies on the validity of the Mojac scale had already shown that it can distinguish the different moral orientation of students. Here we used a different approach to test its validity. Each student in the pilot study was given a report with his/her libcom scores on it and a description of the meaning of the scores after completing the questionnaire. The student was then asked to assess how accurate and how well their libcom scores described them. Eighty-one per cent of the respondents considered that their test scores quite accurately reflected their own perceptions of themselves in the moral orientation (also KI Tsou, unpublished data, 2010).

Data analysis

In each of the two cohorts of medical students, three moral orientation groups were created using a tri-median split of libcom scores. Using the χ² test, a comparison of basic data of students among the three moral orientation groups was made in relation to age, gender, family financial situation, and education level and profession of both parents. The significance evaluation of the changes in libcom scores over the 2-year period were calculated for each group by using a paired t test. In order to understand how the different backgrounds of medical students influenced their change in moral orientation, mean change scores were compared by using an independent t test based on each of the characteristics such as gender, family economic status, parents’ education and jobs. All statistical analysis was performed using SPSS V18.0 for Windows.

RESULTS

There were 433 first-year students from four classes and 169 third-year students from two classes who completed the questionnaires. After 2 years, 271 (62.6%) and 109 (64.5%) of these first and third-year students, respectively, completed the second questionnaires and those who completed questionnaires from these two periods formed the basis of study. Because our study took 2 years, and the second survey was carried out before the end of the school year, students were busy with the preparation for their final examinations, so that some of them did not take part in the survey. In addition, there were 41 and 25 incomplete questionnaires from the first and third-year groups, respectively,
and these also contributed to the approximately one-third non-response rate. The average age of the respondents was 19.5 ± 1.7 years (range 18, 31) for first-year students and 21.5 ± 2.3 years (range 19, 36) for third-year students. Basic demographic data and the parental economic status, education and occupation for each student are shown in Table 1. In order to establish if the responders were still representative of their entire class, we have compared the demographic data and parental backgrounds of the responders with those from their entire class, and found no significant difference between the responder group and their entire class. This holds true for both the first and third-year responders. Furthermore, comparison of the three moral orientation groups of the first and third-year students showed no difference in relation to age, gender, family income, and the education and jobs of both parents.

Mean libcom scores of first-year students showed a significant change, whereas those of third-year students did not show any change. The mean libcom score for first-year students was 111.0 ± 10.4 (time 1), which became 109.6 ± 10.5 (time 2) after 2 years (p = 0.014). The libcom score for third-year students was 115.5 ± 11.3 (time 1), which became 115.6 ± 11.7 (time 2) after 2 years (p = NS). The two cohorts of students were compared in relation to their moral orientation: libertarian, dual and communitarian. Analysis of the changes in the libcom score showed that the groups with dual moral orientation did not show any change after 2 years of preclinical medical education, but in the libertarian groups, libcom scores in the first and third-year students had significantly increased from 99.4 ± 10.5 and 105.0 (p = 0.000) and 105.7 (p = 0.007), respectively. In contrast, in the communitarian group, libcom scores of first and third-year students had decreased significantly from 122.8 and 126.1, respectively, to 116.0 (p = 0.000) and 121.5 (p = 0.02) (table 2).

Analysis of the relationship between the background of students and change in libcom scores showed that in the first-year dual group, those students who listed their fathers’ profession as ‘professional’ showed more significant change than those who listed the profession as ‘non-professional’ (p = 0.005). In addition, the third-year libertarian group and first-year communitarian group, the change in libcom score was significant higher in the male than female students (p = 0.039 and p = 0.052, respectively) (tables 3 and 4).

### Table 1 Baseline characteristics of Taiwan medical students, 2007—9

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>First-year students</th>
<th>Third-year students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>166 (61.3%)</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>105 (38.7%)</td>
</tr>
<tr>
<td>Family economic status</td>
<td>Well off</td>
<td>140 (51.7%)</td>
</tr>
<tr>
<td></td>
<td>Average or poor</td>
<td>131 (48.3%)</td>
</tr>
<tr>
<td>Father’s education</td>
<td>Above high school</td>
<td>208 (76.8%)</td>
</tr>
<tr>
<td></td>
<td>High school or below</td>
<td>63 (23.2%)</td>
</tr>
<tr>
<td>Father’s job</td>
<td>Professional</td>
<td>154 (56.8%)</td>
</tr>
<tr>
<td></td>
<td>Non-professional</td>
<td>117 (43.2%)</td>
</tr>
<tr>
<td>Mother’s education</td>
<td>Above high school</td>
<td>165 (60.9%)</td>
</tr>
<tr>
<td></td>
<td>High school or below</td>
<td>106 (39.1%)</td>
</tr>
<tr>
<td>Mother’s job</td>
<td>Professional</td>
<td>97 (35.8%)</td>
</tr>
<tr>
<td></td>
<td>Non-professional</td>
<td>174 (64.2%)</td>
</tr>
</tbody>
</table>

### DISCUSSION

Moral orientation is considered to be a personal trait that is not easy to change with education. Previous studies on the effect of education on the moral orientation of students only focused on the overall change in the libcom scores, and did not study the change in students with different moral orientation, so that any increase in the score in one group of students will be cancelled by the decrease in score in another group, thereby showing no change in the overall libcom score. Our study showed that students had changed their moral orientation after 2 years of medical school training. Students with communitarian orientation showed a decrease, whereas students with libertarian orientation showed an increase in their libcom scores. In contrast, students with dual orientation showed no change. These results showed that education channels the students more towards dual orientation. This type of moral orientation (dual orientation) is more suitable for clinical situations because a clinician has to consider a situation from many aspects when making a moral decision. For example, factors such as equality of healthcare resources distribution, severity of a patient’s medical condition, a patient’s wish (or decision), and possible benefits and harms, are important issues for a clinician to consider when making a moral decision. Consideration of these factors will undoubtedly lead to conflicts, and only after careful weighing of the pros and cons can a clinician arrive at a logical moral decision. Clinicians with moral orientation leaning more towards libertarian or communitarian when faced with moral dilemmas often cannot balance different issues, thus missing some important moral issues in their decision-making process. Gilligan also suggested that moral maturity is characterised by the ability to maintain both the justice and the care in some sort of balance. In addition, we also found that the overall libcom scores of first-year students showed significant change, which agrees with the view expressed by Hren et al that ethical values of 19–22-year-old university students can be modified if appropriate training on ethics can be provided in the curriculum. In Taiwan, a basic foundation on ethical values is provided to first and second-year students through lectures, small group discussions, case studies and role playing. When they enter problem-based learning courses in the third and fourth years, they apply and strengthen their basic...
knowledge on medical ethics through the discussion of clinical ethical issues embedded in the healthcare problems in the tutorials. This type of curriculum design may have a positive influence on the moral orientation of the medical students. Therefore, we should reconsider the appropriateness of discarding students with libcom scores from the two extremes during the admission process. 

Libcom scores may be influenced by the cultural background of the students. The average libcom scores of the students in our study were similar to those reported in other studies. Bore et al. measured the medical school applicants and first-year medical students in Australia, New Zealand, Scotland and England and obtained libcom scores between 110.9 and 117.4. The libcom score in our study was 111.1 for first-year students and 113.5 for third-year students, which were within the range reported by Bore et al. When we divided our students into three moral orientations, we found that there was a significant difference in scores between the high score group (communitarian) and low score group (libertarian). The difference in the first-year student group was 23.4 compared with 24.8 in the third-year student group. Such a big divergence in scores may be related to the admission process in Taiwan, which is based primarily on marks, so that students with different moral orientations can enter medical schools. In contrast, in schools that used personal interview as part of the admission process, personality traits and moral orientation of the students may be more homogeneous so that the gap in their libcom scores may be closer. Further study is needed to show whether the moral orientation of students admitted based on marks is more heterogeneous than those admitted based on personal interviews.

An understanding of the distribution and types of moral orientation of medical students is important for teachers who are planning the curriculum on bioethics. This is because students with different moral orientations when faced with
moral dilemmas may arrive at different interpretations and decisions, and the way to change their value system is to consider things from their point of view. Teachers need to apply the principle of ‘student-centred learning’, after learning the moral orientation of the students, to come up with appropriate curricula and teaching methods to achieve the best result. Furthermore, many studies have shown that using a small group tutorial learning method can raise the students’ sensitivity to ethical issues and increase their moral reasoning ability. The question arises as to whether we should control the composition of a tutorial group. We suggest that we can measure the moral orientation of the students at the beginning of a course, so that each group will contain students with different moral orientation. This will allow the students to be exposed to different points of view. Tutorial content can also be multifaceted in relation to moral issues. Future studies can measure the effectiveness of this type of approach and students’ satisfaction.

There are two factors that influence the moral development of a person: personal characteristics such as gender, age and level of education; and familial and societal factors such as educational level and income of the parents, and cultural background. Due to the fact that our students were first and third-year students, there was no significant difference among them in terms of age, level of education and cultural background, so that to explore the factors that influenced the changes in the libcom scores, we decided to use gender and the background of the parents as potential factors. We found that in the first-year dual group, students with their father’s job listed as professional showed a greater decrease in libcom score than those whose father was listed as a non-professional. In the third-year libertarian group and first-year communitarian group, the degree of change in libcom scores was higher in the male students than female students. After Gilligan had proposed care and justice moral orientation theory, the relationship between gender and moral orientation has been a hot topic for research, but the results were unequivocal. A meta-analysis by Jaffee and Hyde on the influence of gender differences on moral orientation found that small differences in care orientation favour women and small differences in justice orientation favour men. These findings do not offer strong support for the claim that the care orientation is used predominantly by women and that the justice orientation is used predominantly by men. In this study, we found that a gender-based change in libcom score was found only in the third-year libertarian group and first-year communitarian group. These results are similar to those reported by others, ie, gender plays a minor role in the change in moral orientation. Concerning the influence of family background on moral orientation, some have suggested that the moral development of Chinese individuals is greatly influenced by family members, because traditional thinking is that children strive to be obedient and to satisfy the wishes of their parents. However, we found that the influence of family background only showed up in the first-year dual group in which father’s profession had a small influence on the change in libcom score. Based on these findings, we therefore suggest that personal characteristics and family background have no major correlation with the change in moral orientation of the students.

Our study had some limitations. First, there was no control group within each cohort of students so that we should be cautious in interpreting the influence of medical education on the development of moral orientation of the students. University curricula in Taiwan medical schools have courses on humanity and philosophy as prerequisites, so that it is not possible for us to have an experimental and control group to study the influence of medical education on moral orientation. Second, students who completed the second questionnaire constituted 62.6% of the first-year and 64.5% of the third-year students, yielding approximately one-third of the non-response rate. However, a comparison of the composition of the responders and the entire student class did not show any significant difference, so that the presence of the one-third non-responders probably did not affect our results. Finally, our study was carried out in Taiwan, which may not be applicable to other regions with different cultural backgrounds. Most Asian medical schools choose their students based on examination results and their average age is between 18 and 19 years. In contrast, personal interview is part of the admission process in medical schools in Europe and North America, so that students more suitable for medicine are probably selected through this process. Some of these students already have college degrees, and the age of these students is also older than Asian students. Further study is needed to see if our results are also applicable to students in Europe and North America.

In conclusion, we have divided the moral orientation of medical students in Taiwan into three groups, and found that there was a large gap between the libcom score of the high scoring (communitarian) and low scoring (libertarian) groups. After 4 years of preclinical medical education, students in the communitarian and libertarian groups changed towards dual orientation. We therefore caution against the use of moral orientation as a selection criterion of medical students during admission. Furthermore, we suggest that the Mojac scale can be used in the assignment of students into different tutorial groups, so that students with different moral orientation can share and learn from each other their point of view.

Acknowledgements The authors are grateful to Professor David Powis and his colleagues who provided the instrument of personal qualities assessment (http://www.pqa.net.au) and scored the responses. The authors also want to thank Professor Robert MKW Lee, McMaster University, Canada, for his critical comments and suggestions.

Funding This project was supported by a grant from the National Science Council (NSC 95-2618-S-030-004-MY3). The NSC supports the academic research in Taiwan.

Competing interests None.

Patient consent Obtained.

Ethics approval Ethics approval was provided by Fu-Jen Catholic University.

Contributors CSL co-designed the study, analysed the data and drafted the manuscript. SLC, MSH, HCW and CHL recruited participants and revised the manuscript. KIT designed the study and supervised the conduct of the study.

Provenance and peer review Not commissioned; externally peer reviewed.

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