

Does moral judgement improve in occupational therapy and physiotherapy students over the course of their pre-licensure training?

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Abstract

Healthcare professionals often encounter moral dilemmas in clinical practice that require increased responsibility and accountability for ethical decision-making. This paper reports the results of a 6-year longitudinal study that explored changes in moral judgement of five consecutive cohorts of occupational therapy (OT) and physical therapy (PT) students over the course of their professional training. The training programme included an ethics education component. The Defining Issues Test (DIT) developed at the University of Minnesota was used to measure moral judgement. A total of 548 students participated in the study. At entry into their professional training, the DIT scores of the OT and PT students were similar but higher overall than the norms established for college level students or for graduates from professional programmes in the DIT standardization sample. At the time of graduation, results showed no significant differences in moral judgement scores between males and females, their chosen programme of study (OT or PT), year of entry, or previous education. Comparing entry scores to exit scores from both programmes for 288 students who provided data at both times, we found that moral judgement scores increased significantly in both OT and PT students over the 2-year programme of study. No differences were found in scores across gender, programme, year of entry, or previous education. Implications are discussed for including a formal ethics education component in the curricula of all health professional training programmes. Recommendations for future research are outlined.

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Introduction and purpose

Healthcare professionals are encountering clinical situations that require increased responsibility and accountability for ethical decision-making. This has been accelerated by advances in, and growth of, medical technologies (Nandi 2000; Kim *et al.* 2004), evolution of professional autonomy (Sisola 2000; Swisher 2002), and the application of business models to healthcare delivery (Davis 2005). As a result, 'principled moral reasoning is increasingly essential given the complexities faced by [healthcare professionals] in practice today'. (Duckett *et al.* 1997, p. 228).

The concept of principled moral reasoning is derived from the work of Kohlberg (Rest 1994; Sivberg 1998; Riesch *et al.* 2000). Based on studies of young males, Kohlberg identified six stages of cooperation or moral reasoning. The first two stages, which Kohlberg refers to as pre-conventional morality, are built upon the concepts of obedience to authority (stage 1) and self-interest (stage 2). Moral decisions are made on the basis of the immediate consequences and of the exchange of favours (Rest 1994; Riesch *et al.* 2000). During maturation, individuals tend to progress to the next two stages, described as conventional thinking. Stage 3 involves the concept of reciprocal interaction and mutual caring with selected others, whereas stage 4 expands to include the societal concepts of law and order (Rest 1994; Sivberg 1998). The majority of adults adhere to conventional morality (Riesch *et al.* 2000). The final stages (5 and 6), or postconventional morality, encompass principled reasoning. They are, respectively, characterized by universal principles of justice and fairness (Riesch *et al.* 2000) and by shared ideals of reciprocity within cooperative society (Rest 1994; Walker 2002).

Based on her research on girls and young women, Gilligan (1982) challenged Kohlberg's presumption that his findings with male subjects applied to both males and females. Contrary to current thinking at the time, she reported that men's moral reasoning was privileged over women's; however, she explained the difference by arguing that men were more concerned with the 'justice' perspective on which Kohlberg's theory was based, while women had their own

distinct path of moral development and were more compelled by the 'care' perspective. Although Gilligan's theory gained popularity with her nursing colleagues and other feminists, there was little evidence to support her theory even after several years of further research (Rest as cited in Rest 1994). For instance, in a study of moral judgement in registered nurses, Cady (1991) disputed the sex-based approaches to moral reasoning since no significant difference was found between male and female nurses. Rather, nurses incorporated both justice and caring into their moral reasoning.

Rest and colleagues at the University of Minnesota pursued research in moral development with both males and females and developed the Four Component Model (FCM) (Rest 1994). The FCM is a framework that describes the interconnected processes that comprise moral behaviour. Rather than describing a linear sequence (stages), it portrays moral decision-making as interactive and includes moral sensitivity (the ability to identify moral issues), moral judgement (the ability to reason and determine the moral course of action), moral motivation (the ability to prioritize moral values relative to each other) and moral character (the courage and persistence to carry out a course of action) (Rest 1994; Thoma 2002).

The Defining Issues Test (DIT) was developed by Rest in 1974 as a means to measure the moral judgement component of the FCM. Its primary measure was the 'P' index – p for principled or postconventional moral reasoning (Thoma 2002). The 'P' score is based on the ranking used by the participant in responding to each of the six scenarios in the DIT. Some 20 years later, Rest *et al.* (1997) developed the N2 index as a more reliable and valid measure than the P score as it both ranks and rates the data. 'N2 scores are adjusted to have the same mean and standard deviation as the P score on the 1995 Standardization sample ($n = 1115$) so that comparisons between P and N2 can easily be made'. (Rest *et al.* 1997, p. 501).

Over many years, Rest and others studied the predictors of change in moral judgement, as measured by the DIT. Although Rest (1994) reported slight sex differences in favour of females, this result accounted for only 0.5% of the variance in DIT scores.

The best predictors of change were age and level of education, with education being 250 times more powerful than sex. King & Mayhew (2002) agreed that 'participation in higher education makes a substantial contribution to development in moral judgement beyond that attributable to age alone' (p. 250). For example, college students are more likely to use postconventional levels of moral reasoning than non-college students; however, no correlation has been shown between moral judgement (as based on the DIT) and race or ethnicity of college students in the USA (King & Mayhew 2002). In a secondary analysis of 30 years of data from four different research teams, Dawson (2002) concluded that 'moral stage scores for women and men are distributed similarly once educational attainment has been taken into account' (p. 155).

Given the challenges of healthcare practice and the impact of college education on students, it is not surprising that ethics education is an important component of pre-licensure training for healthcare students. Historically, ethics education in nursing, occupational therapy and physiotherapy programmes has relied on traditional pedagogical formats of ethics courses and large-group lecture style (Finley & Goldstein 1991; Barnitt 1993; Brockett 1996; Silva & Guillet 1996). However, Ten Have (1995) and subsequently Goldie *et al.* (2001) demonstrated that small group, integrated ethics education in a problem-based learning format is a more effective approach. Ethics education should begin early in the educational process, include case studies using problem-solving approaches, and involve mentorship in the clinical practice experiences (Doherty 2005). Learning environments that 'provide opportunities for group participation, shared decision-making, and assumption of responsibility for the consequences of actions tend to stimulate the development of higher levels of moral judgement' (Kim *et al.* 2004, p. 255).

Research on the development of moral judgement in nursing students during their training presents mixed findings. In two cross-sectional studies, one in Finland reported a significantly higher P score in senior level students compared to first year students (Auvinen *et al.* 2004), and the other in the USA found senior students scored higher than junior students

at three different college nursing programmes (Krawczyk 1997). Three longitudinal studies have been published. At the Catholic University College of Nursing in Korea, the P score was not significantly different in the fourth year compared to first year results (Kim *et al.* 2004). A study at the University of Minnesota included four consecutive cohorts of nursing students and the P score gains between entry into and graduation from the programme were significant for all four cohorts (Duckett *et al.* 1997). Finally, for nursing students entering three different colleges in Sweden at the same time, one group had significant gains in the P score and the other two did not (Sivberg 1998). On balance, it would appear as though pre-licensure nursing training is likely to yield moral development.

For occupational therapy (OT) and physical therapy (PT) students, one longitudinal study is reported for two consecutive classes (Dieruf 2004). The author found no significant difference between the two professional groups or within each group when comparing entering and exiting P scores. However, Dieruf acknowledged the small sample size and lack of generalizability to other institutions as limitations of the study, and concluded that OT and PT curricula should facilitate ethical decision-making as part of pre-licensure training.

In Canada, the national associations as well as the provincial regulatory bodies for occupational therapy and physiotherapy outline the values espoused by each profession. The College of Occupational Therapists of Ontario (2002) describes the following:

In all professional undertakings, registrants will adhere to the values of integrity, dignity, sensitivity to diversity, and trust. Additionally, registrants will respect the principles of accountability, communication, consent, confidentiality, transparency, professional boundaries, and avoidance of conflict of interest. Within the context of these values and principles, registrants have obligations to the public, to the profession, and as professional practitioners (p. 1).

The Canadian Physiotherapy Association's Code of Ethics (2008) states 'Physiotherapists are committed to act with integrity, to honour the rights and dignity of all individuals, to recognize their responsibility to society and to pursue a quest for excellence in professional activities'.

Given moral development is a crucial part of professional moral development (Bebeau 2002), the purpose of this study was to evaluate the moral judgement of the McMaster OT and PT students at entry into and exit from the respective programmes, as measured by the DIT. This research project occurred concurrently with the implementation of a formal ethics education component in both the OT and PT programmes at McMaster University in Hamilton, Ontario, Canada. The ethics component was presented using a problem-based learning approach (Geddes & Brockett 2005) and the material was set in the context of clinical practice in Canada. The research questions were:

- 1 Is there a difference in moral judgement between the programmes (OT and PT) at entry into or exit from training?
- 2 Does moral judgement improve over time between entry into and exit from the programmes?
- 3 Are there any differences in moral judgement across cohort (year of graduation) and programme (OT and PT)?
- 4 Is there a relationship between moral judgement and sex or previous level of education?

Methods

Design

The design of this study was longitudinal and comparative. It included 10 groups, comprised of five consecutive years of students in the Bachelor of Health Sciences (BHSc) OT and PT programmes at McMaster University. Given both programmes required 2 years of full time study, data were collected over a 6-year period. Ethics approval was received from the OT and PT Education Committees at McMaster University. Testing occurred within 1 month of entry into the OT or PT programme (time 1) and during the final academic term of study (time 2). Time 1 and time 2 were approximately 22 months apart.

Participation in the study was voluntary and students could withdraw after time 1 or enter the study at time 2. Written consent was obtained at both time 1 and time 2. A research assistant conducted the testing and maintained all documentation during the students' time in their respective programmes. The authors were blinded to the results until after

the students' graduation. Following graduation, demographic data (year of entry, year of graduation, sex, date of birth and previous level of education) of all research participants were recorded along with test scores from time 1 and time 2. The Statistical Package for the Social Sciences (spss) was used for analysis.

Instrument

The DIT developed by Rest and colleagues (Rest *et al.* 1997) at the University of Minnesota in the USA was used to measure moral judgement. It was chosen for several reasons: (i) it is based on Rest's theoretical framework, the FCM which emerged from Kohlberg's original work; (ii) it has undergone significant testing and demonstrates sound psychometric properties (Bebeau & Thoma 2003); (iii) it is commonly used in studies exploring the moral judgement of health professional students; (iv) it is simple to administer and to protect research participants' identity; (v) investigator bias is reduced since all scoring is conducted at the University of Minnesota; and (vi) although other tools were developed in the early 1990s, such as the Moral Sense Test, the Moral Judgement Test and the Moral Reasoning interview, they were relatively new and untested at the time this study was initiated.

The DIT is a group-administered, multiple choice style test that is not time limited. It includes six scenarios, each presenting a moral dilemma. For each scenario, the student must first select his/her preferred course of action and then rank the relative importance of 12 statements about the scenario in influencing his/her choice of action. Further information on the DIT and a sample of one of the scenarios are available at <http://www.centreforthe-studyofethicaldevelopment.net/>.

All scoring was completed by the Center for the Study of Ethical Development at the University of Minnesota. The scoring involves standard reliability checks to eliminate research participants who answered with random responses or meaningless repetition. The N2 index was used in this study. A higher N2 score indicates an individual has a more universal stage of moral development associated with post-conventional morality or Kohlberg's stages 5 and 6 (Rest *et al.* 1997).

Research participants

Research participants were students enrolled in the BHSc (OT) or BHSc (PT) programmes at McMaster University. These programmes were offered as a second baccalaureate degree. All students entering either programme had at least one 3-year baccalaureate degree.

Both programmes were designed using problem-based learning principles where learning is student-centred and facilitated primarily in small-group settings (Baptiste & Solomon 2005). There is integration of academic studies and clinical practice fieldwork within each of the six terms (2 years full time) of study. In special circumstances (e.g. medical, academic or personal reasons), students were able to withdraw for 1 year and apply to re-enter the programme once during the course of their studies.

The inclusion criteria for students to participate in this study were: (i) voluntary consent; (ii) completion of the DIT at time 1 and/or time 2; (iii) completion of the OT or PT programme within the requisite 2 years; and (iv) valid DIT scores at time 1 and/or time 2 as determined by the Center for Ethical Development at the University of Minnesota (i.e. scores did not contain random responses or meaningless repetition).

Analysis

An analysis of covariance (ANCOVA) was performed on the N2 scores at time 1 with year of entry, programme of study (OT or PT), sex and previous level of education as the independent variables to determine if there were any baseline differences in moral judgement. Age at year of entry into the programme was included as a covariate to minimize age differences that might bias comparisons between cohorts. The same analysis was performed on N2 scores at time 2 to determine if differences in level of achievement were observed. In addition, a repeated measures analysis was performed on the subset of participants for whom N2 scores were available at both time 1 and time 2 (using time, sex, programme of study (OT or PT) and year of entry as independent variables) to determine whether or not participants' moral judgement scores improved during their professional training over the course of the 2-year programme.

Results

A total of 548 students completed the DIT at least once (OT = 266, PT = 282). This represents 90.1% of the OT students and 97.2% of the PT students that graduated during the study timeframe. As indicated in Table 1 and Table 2, 504 students met all inclusion criteria. All inclusion criteria were met by the 288 students who completed the DIT at both time 1 and time 2 (OT = 155, PT = 133). All 432 students who completed at time 1 were used to test for baseline differences, and all 360 students who completed at time 2 were used to test for differences in absolute level of achievement. The subset of 288 students who completed the DIT at both time 1 and time 2, were used to test for differences in improvement of moral judgement.

Of those who met the inclusion criteria, the mean age of the students on entry was 25.3 years with a range of 21–47. The majority (82.7%) of participants were female, with the smallest proportion of males being in the OT cohort. The majority (73.4%) of participants entered their professional training after completing just one Bachelor's degree. Demographic data for each programme are illustrated in Table 2.

The ANCOVA performed on the N2 scores of the 432 students completing the DIT at time 1 revealed no baseline differences between males and females ($P > 0.7$), programme ($P > 0.8$), cohort ($P > 0.4$), or previous education ($P > 0.5$). Mean scores, by sex and programme, are illustrated in Table 3 and include a mean N2 score for OT and PT of 46.4 and 49.1, respectively. A significant interaction was observed between sex and programme, $F_{1,370} = 7.4$, $MSE = 131.1$, $P < 0.01$. *Post hoc t*-tests revealed the source of this interaction to be significantly lower scores on the part of male OTs relative to female OTs; however, it should be noted that only 19 male OTs were included in the sample (i.e. a small number relative to the other cells in Table 3).

The ANCOVA performed on the N2 scores of the 360 students completing the DIT at time 2 revealed no differences in achievement between males and females ($P > 0.7$), programme ($P > 0.8$), cohort ($P > 0.2$), or previous education ($P > 0.7$). No interactions were statistically significant. Mean scores, by sex and programme, are illustrated in Table 4

Table 1 Participation rate and number of cases that failed to meet inclusion criteria as a function of programme of study

	Occupational therapy	Physical therapy	Occupational and physical therapy
Number of students graduating during study	295	290	585
Number of students completing DIT	266	282	548
	255 at time 1	258 at time 1	513 at time 1
	207 at time 2	189 at time 2	396 at time 2
	155 at both times	165 at both times	361 at both times
Number of cases purged by DIT centre's scoring system	36 for time 1	30 for time 1	66 for time 1
	15 for time 2	18 for time 2	33 for time 2
Number of students completing a valid DIT	256	264	520
	219 at time 1	228 at time 1	447 at time 1
	192 at time 2	171 at time 2	363 at time 2
	155 matched Pairs	135 matched Pairs	290 matched Pairs
Number of students with valid DITs who did not graduate within 2 years	2	14	16
Number of students who met all inclusion criteria	254	250	504
	217 at time 1	215 at time 1	432 at time 1
	192 at time 2	168 at time 2	360 at time 2
	155 at both times	133 at both times	288 at both times

DIT, Defining Issues Test.

Table 2 Demographics of participants who met inclusion criteria as a function of programme of study

	Occupational therapy	Physical therapy	Occupational and physical therapy
Number of students who met all inclusion criteria	254	250	504
Number of females	231	181	412
Number of males	23	69	92
Age at which subjects entered programme	Mean = 25.3	Mean = 25.3	Mean = 25.3
	Min = 21	Min = 21	Min = 21
	Max = 47	Max = 35	Max = 47
Previous highest level of education	Bachelor – 192	Bachelor – 178	Bachelor – 370
	2 Bachelor's – 24	2 Bachelor's – 16	2 Bachelor's – 40
	Graduate Degree – 6	Graduate Degree – 15	Graduate Degree – 21
	Unknown – 32	Unknown – 41	Unknown – 73

and include a mean N2 score for OT and PT of 53.2 and 50.1, respectively.

To assess the test–retest reliability of N2 scores, an intraclass correlation coefficient (ICC) was calculated using the time 1 and time 2 scores available for the subset of participants who completed the DIT both

at the start and end of the programme. The ICC of 0.75 indicates highly consistent scores and ranking of participants.

The repeated measures ANOVA performed on the subset of 288 participants indicated that N2 scores increased significantly from time 1 to time 2;

Table 3 Mean N2 scores (for all 432 students who completed the DIT at time 1 and met inclusion criteria) as a function of sex and programme

	Occupational therapy	Physical therapy	Mean
Males	43.0 <i>N</i> = 19	49.1 <i>N</i> = 55	46.0 <i>N</i> = 74
Females	49.9 <i>N</i> = 198	49.0 <i>N</i> = 160	49.4 <i>N</i> = 358
Mean	46.4 <i>N</i> = 217	49.1 <i>N</i> = 215	

Table 4 Mean N2 scores (for all 360 students who completed the DIT at time 2 and met inclusion criteria) as a function of sex and programme

	Occupational therapy	Physical therapy	Mean
Males	52.0 <i>N</i> = 18	48.6 <i>N</i> = 48	50.3 <i>N</i> = 66
Females	54.5 <i>N</i> = 174	51.6 <i>N</i> = 120	53.0 <i>N</i> = 294
Mean	53.2 <i>N</i> = 192	50.1 <i>N</i> = 168	

$F_{1,268} = 19.1$, $MSE = 46.6$, $P < 0.001$. Time interacted significantly with programme $F_{1,268} = 4.6$, $MSE = 46.6$, $P < 0.05$ indicating that the OT students in this subset of respondents improved to a greater extent than the PT students, starting off with slightly lower moral judgement scores than the PTs and ending up with slightly higher scores. No other main effects or interactions were statistically significant. Mean N2 scores for participants who completed DITs at both time 1 and time 2 are illustrated in Table 5.

Discussion

The mean N2 scores of the OT and PT students (46.4 and 49.1, respectively) on entry into the professional training programme were higher than the mean N2 scores described by Bebeau & Thoma (2003) for college graduates (36.85 ± 15.53) or those

Table 5 Mean N2 scores (for the subset of 288 participants who completed a DIT at time 1 and time 2) as a function of programme

	Occupational therapy (<i>N</i> = 155)	Physical therapy (<i>N</i> = 133)	Combined (<i>N</i> = 288)
Time 1	48.1	49.5	48.8
Time 2	54.8	51.6	53.2

completing a professional degree (44.97 ± 14.87). It is not possible to account for this difference. The admissions selection process, variation in level of education and age on entry may have had some influence, but this is speculative. Less than 10% of applicants were accepted into the OT and PT programmes, admissions decisions being based on grade point average, autobiographical sketch and interview. The majority of OT and PT students entered with a college level (baccalaureate) degree but the remaining students entered with two baccalaureate degrees or graduate degree, which could have included a prior professional degree. The mean age of the OT and PT students on entry into the professional training was 25.3, similar to that of a college graduate, but the range went up to 47 years.

The males in the OT programme scored significantly lower than the females on entry into the professional programme, but this difference was not replicated in the PT programme. This finding should be interpreted with caution, given the small number of male OT students and that no such difference was found on exit from the OT programme. As Dawson (2002) suggested, differences in DIT scores between males and females are typically small.

The mean N2 scores at exit from the respective programmes showed no differences in achievement between males and females, programme, cohort, or previous education. The mean N2 scores for both the OT and PT students (53.2 and 50.1, respectively) were higher than the mean N2 scores described by Bebeau & Thoma (2003) for a professional degree (44.97 ± 14.87) or PhD level of education (48.99 ± 15.60). Again, it is not possible to account for this difference.

The results of the participants who completed the DIT at time 1 and time 2 showed that the moral

judgement of students in the OT and PT programmes significantly improved over time ($P < 0.001$). There was no interaction by year of graduation. This appears to refute the argument that external events may have affected the students' moral development. Although there may be several possible unanticipated confounds that could account for individuals' findings, the one known consistent influence for all research participants was their participation in either the OT or PT Programme. However, it is not possible to isolate which aspects of the Programmes may account for this improvement. For instance, could it have been the academic studies, the clinical fieldwork, the problem-based learning style, the ethics education content stream, the role modelling and mentorship of faculty or senior students, and/or the hidden curriculum? There was a significant interaction by programme with the OT students showing greater improvement. The OT students had slightly lower N2 scores than the PT students on entry and obtained slightly higher N2 scores on exit, but again the lower OT scores at time 1 may be unduly driven by the apparently anomalous results for the small sample of male OTs at time 1.

The improvement in moral judgement of the OT and PT students at McMaster is not consistent with the findings of Dieruf (2004) at the University of New Mexico (UNM). Both the UNM and McMaster studies included OT and PT students participating in 2-year bachelor level professional programmes. There were differences, however, in the prior level of education, the mean age and the number of research participants between the two studies. Although over one-half of the UNM students had no prior bachelor degree, their mean age on entry in their programmes was 29 years (OT) and 31.6 years (PT). On the other hand, all McMaster students had a minimum of a bachelor degree before entry, yet had a lower mean age of 25.3 years for both programmes. The UNM study reported on two consecutive years of graduating students while the McMaster study reported on five consecutive years. This resulted in a substantial difference in research participant numbers: 94 UNM vs. 504 McMaster students. Dieruf (2004) indicated one of the limitations of her study could have been the small sample size. The difference between the two studies may have implications for admissions

practices. If the difference is stable, it may provide an indication that prior educational training is a better predictor of the moral development that can be achieved during training than age at entry.

Dieruf (2004) suggests that one possible explanation for why the UNM programme did not enhance the moral judgement of their students was their age and advanced levels of education on entry to their programmes. However, this hypothesis appears contradictory to the McMaster results. The mean age of the McMaster students was somewhat younger than UNM but the range was from 21 to 47 years. All McMaster students entered with an advanced level of education, yet, there was a significant improvement in their moral judgement over time, improving to a level higher than normative values for students completing a professional degree. The McMaster findings support those of King & Mayhew (2002) where participation in higher education is more influential than chronological age in moral development.

There is one remaining difference between these two studies that is worth noting. Dieruf (2004) reports that while both the OT and PT programmes include some content related to ethics,

Neither program includes the recommended 3–12 weeks of ethical instruction. It may be that too much curricular time in these programs is spent on teaching the technical skills and not enough time is spent on critical thinking, problem solving, and challenging the students to develop cognitive reasoning skills in the area of ethical decision-making. (p. 28)

Dieruf (2004) concludes that educational programmes must implement curricula that facilitate ethical decision-making. The McMaster programmes were both based on the pedagogical framework of problem-based learning, incorporating small group and case-based study, and had undergone substantial development of the ethics content.

Moral judgement research in the fields of medicine and nursing appears to support the importance of ethics education in the curricula of healthcare students for enhancing their moral reasoning skills. Holm *et al.* (1995) found a significant improvement in moral reasoning (based on the DIT) of medical students following the completion of a 3-month course on the philosophy of medicine that included

teaching of medical ethics. Krawczyk (1997) studied nursing students in three different programmes. One programme included an ethics course with group participation and a decision-making component, while the other two programmes did not. The students in the programme with the ethics course scored significantly higher on the DIT than those in the other two programmes. Krawczyk concluded the ethics course facilitated the development of moral judgement. Auvinen *et al.* (2004), in comparing first year and final year nursing students, found significantly higher moral judgement scores for the final year students compared to first year students, and concluded that 'students who had to deal with ethical dilemmas in their practical training had higher moral judgement than students who did not' (p. 538). In comparison, Kim *et al.* (2004) found no significant difference in the moral judgement of nursing students between entry and exit from their 4-year programme of study. They reported 'Korean nurses are not properly prepared to express and apply their viewpoint on specific dilemmas' (p. 255) and recommended ethics education that is relevant.

The study conducted by Duckett *et al.* (1997) most closely parallels that of the McMaster study. It was a longitudinal study of four consecutive graduating classes of nursing students with a sample of 348 students. 'The students in this study had the benefit of a carefully constructed ethics curriculum, based on the multi-course sequential learning model ... and designed to enhance the ability to reason about ethical issues' (p. 227). Like the McMaster results, there was significant improvement in moral judgement for all four cohorts.

Although this evidence appears to support the contention that ethics education enhances moral development of healthcare professional students, the clinical relevance of this is worthy of consideration. Is there a relationship between moral judgement and ethical clinical practice? Nortvedt (2001) argues that

... ethical sensitivity plays an important role in clinical judgement and action ... a person's moral character plays an important role in constituting clinical competency, in the way a professional expert clinician has to be a person who is most sensitive to the moral aspects of a clinical situation ... good morals are the most essential and constitutive part of professional art. (pp. 28–29).

There is some research that appears to link moral judgement and clinical practice, but this is an area of study that requires further research. Lew-Snyder (2003) found that moral judgement had the greatest effect on registered nurses' self-reported assessment of their clinical decision-making skills when compared to age, years in practice, degree obtained or level of satisfaction with values conflict. It was concluded that activities that help nurses understand and use principled moral judgements should facilitate their confidence in their clinical decision-making. Furthermore, qualified nurses were found to have significantly higher moral judgement scores than nursing students (Kim, Park & Han 2007). Kim *et al.* concluded that clinical experience after graduation improved the moral judgement scores of the qualified nurses. However, they did not study whether this ethical shift in moral judgement scores resulted in more ethical practice. Baldwin *et al.* (1996) studied the relationship between moral judgement scores on the DIT and the rate of malpractice claims for a group of orthopedic surgeons and found an indirect correlation. Those with less than 0.20 claims per year had significantly higher DIT scores than those whose claim rates were higher than 0.40 per year. They speculate that high levels of moral judgement may protect against malpractice claims. On the other hand, Kanny (1996) found no significant differences in the DIT scores of junior level or senior level occupational therapy students or practicing occupational therapists. Following graduation, students did not increase their level of principled ethical reasoning. Future research is recommended comparing the DIT results of this McMaster study with registered occupational therapists and physiotherapists and determining if there is any correlation of these results to measures of ethical practice.

There are a number of limitations to the McMaster study. Since participation was voluntary, it also varied. The number of participants at time 2 (360) was lower than at time 1 (432) with only 288 completing the test at both time 1 and time 2. Those students who chose to participate at time 2 may well have been those students who were morally concerned, introducing the possibility of bias in favour of moral development gains. Although societal events of influence would have affected all students, no record

was kept of such events and no account has been taken of the possible influences of those or of personal tragedies, such as bereavement, upon the moral judgements of individual students. Rest (1993) advises that English as a first language is required for accurate test results, but this information was not collected. Neither was the cultural background of the research participants. The pool of students included individuals who came from a variety of cultural, racial and religious backgrounds, as well as those whose first language was not English. Most importantly, perhaps, a more systematic and comprehensive review of the ethics content of the curricula, both explicit and hidden, as it was delivered would have assisted in understanding better what it was that the McMaster programmes did well in ethics education. Further analysis of the different approaches and the part that sensitization to moral issues plays in moral development would be an interesting focus for future study.

Conclusion

This 6-year longitudinal study at McMaster University used the DIT as a tool to measure change in the moral judgement in OT and PT students over the course of their pre-licensure training. The moral judgement scores of both OT and PT students improved significantly. It is proposed that the McMaster OT and PT programmes, with their ethics education components, contributed to the students' gains in moral development. Each programme took a unique approach to ethics education within a well-established problem based learning pedagogy. Future research is recommended to explore the influence of different learning styles and pedagogical approaches, including ethics content, on moral judgement gains during healthcare professional education programmes.

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