

Measuring moral judgement in physical therapy students from different cultures: a dilemma

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Abstract

The purpose of this cross-cultural study was to compare the level of moral judgement between two groups of students over the period of their professional physical therapy educational programmes as measured by the Defining Issues Test (DIT). Students from two entry-level physical therapy programmes volunteered to participate. The DIT was completed at entry and exit of their respective programmes. DIT mean scores were compared using ANCOVA controlling for age and grade point average. Thirty-eight female, second baccalaureate degree students of diverse religious backgrounds, living in a Western culture and 13 female, first baccalaureate degree students of Islamic religious backgrounds living in an Arabic culture participated. At both entry and exit of their programmes, students from the Western group scored significantly higher on the DIT than the Arabic group (average: 51.1 and 29.9 respectively, $P < 0.001$). An initial score difference was anticipated given the different levels of education between the groups. Over the period of their studies, the DIT scores of the Western group increased significantly while the scores of the Arabic group remained constant. The DIT appears to not measure moral judgement uniformly across cultures. The moral dilemmas are based in Western values and offer limited insight into Arabic, Muslim moral judgement. With increasingly diverse student populations, physical therapy programmes may need to re-examine the nature of moral judgement and adapt their curricula.

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Table 1 'Four component model' of moral

<i>Component</i>	<i>Meaning in professional practice</i>
I. Moral sensitivity	To interpret the reactions and feelings of others.
II. Moral judgement	To acquire sophisticated and abstract principles of moral reasoning for effective functioning. Level 1. Codes of conduct Level 2. Ethical concepts Level 3. Bedrock schema
III. Moral motivation	To be responsible; knowing the right thing to do and doing it.
IV. Moral character	To perform with integrity the complex tasks of the discipline.

Adapted from Bebeau (2002) and Thoma (2006).

Introduction and purpose

A critical factor defining the competency of any health professional is the ability to behave in a moral manner (Bebeau 2002). In articulating how such moral functioning occurs, Rest concluded that four component processes must be active: moral sensitivity (one's interpretation of the situation), moral judgement (the reasoning process a person uses to determine the moral thing to do), moral motivation (prioritization of moral values), and moral character (having the strength of one's convictions) (Rest & Narvaez 1994; Bebeau 2002). These four processes are considered to operate together and interact with each other (Thoma 2006). The moral judgement (MJ) component of the 'four component model' has been a particularly popular focus of research and is, itself, considered to include three levels of functioning: at the most specific level, codes of conduct imposed on the individual guide MJ; at the intermediate level, ethical concepts tied to a particular profession serve as a guide; and, at the most broad-based level, bedrock schema (i.e. values broadly held by society) guide decision-making (Table 1) (Thoma 2006).

Professional education in physical therapy typically focuses on the code of conduct and ethical concepts required by the clinician for everyday ethically based clinical decision-making (i.e. micro-morality) (Swisher, Arsalian & Davis 2005). The bedrock schema (i.e. macro-morality) is considered to be used primarily when the other systems fail or provide inconsistent or incomplete information

(Thoma 2006). This level of MJ is the most general and context-free system for interpreting moral situations and has only begun to be considered in physical therapy. In general, the physical therapy literature related to MJ remains scarce, but it provides some indication that the outcomes of attempts to develop MJ vary according to students' characteristics and the format and/or emphasis placed on MJ/ethics in the professional (entry-level) curriculum.

Students in physical therapy should be expected to improve in their MJ during their professional studies given that the broader literature suggests the best predictors of change of MJ are considered to be formal education and age (Rest & Narvaez 1994). King & Mayhew (2002) reviewed 172 studies and found improved MJ was associated with acquiring college-level education regardless of the student's age and level of MJ at entry. This increase in MJ has been found particularly with health professional education (Rest 1988; Duckett *et al.* 1997). Other factors found to influence MJ at the university level include the moral decision-making climate of the institution; the students' friendship network (Derryberry & Thoma 2000); and the change of students' religious orientation during undergraduate studies (Feldman 1969, 1970). Most investigations of the development of MJ in higher education, however, have been conducted with Western populations (King & Mayhew 2002). Given the increasing cultural diversity in physical therapy educational programmes, MJ needs to be investigated among different cultural groups to better guide the teaching and learning of MJ.

Table 2 Stages of moral reasoning according to Kohlberg

<i>Level</i>	<i>Stage</i>	<i>What is considered to be right</i>
I. Pre-conventional	1. Heteronomous morality	Obedience for its own sake, avoiding physical damage to persons and property.
	2. Individualism	Acting to meet one's own interest and needs and letting others do the same.
II. Conventional	3. Relationships, conformity	Living up to what is expected by people close to you or what people generally expect of people in your role. 'Being good.'
	4. Social system and conscience	Upholding the law except in extreme cases where they conflict with other fixed social duties. Contributing to society.
III. Post-conventional or principled	5. Individual rights	Being aware that people hold a variety of values and opinions. Some non-relative values and rights like <i>life</i> and <i>liberty</i> , however, must be upheld in any society.
	6. Universal ethical principles	Applying the principles of justice and fairness; believing, as a rational person, in the validity of universal moral principles and having a personal commitment to them.

Adapted from Kohlberg (1976, 1981).

The purpose of this collaborative study was to determine:

- whether MJ, as measured by the Defining Issues Test (DIT), changes over time within two different cultural cohorts of students (Western, diverse religious backgrounds and Arabic, Islamic religious backgrounds) completing physical therapy entry-level education, and,
- if any differences in MJ, as measured by the DIT, exist between the two cohorts.

Review of the literature

Over the past 30 years, the concept of moral reasoning has been increasingly scrutinized and delineated. Kohlberg (1976; 1981) distinguished three levels and six linear stages through which individuals may progress over the course of their lives. A brief summary of this model is provided in Table 2. 'Principled' or 'post-conventional' moral reasoning denotes the most developed moral reasoning (maturity). Subsequently in 1982, Rest adapted Kohlberg's concept of moral reasoning into the 'four component model' described above and designed the DIT as an outcome measure for the MJ component (Bebeau 2002). In the DIT, moral dilemmas are presented to test takers who are asked, in part, to use Likert scales to indicate the relative importance of a series of statements with

respect to the impact the statements should have on decision-making pertaining to the dilemma. Examples and further information are available from <http://www.centerforthestudyofethicaldevelopment.net>. DIT scores indicate the relative importance individuals give to 'principled' moral considerations [Kohlberg's stages 5 and 6 (Table 2)] when making moral decisions (Rest *et al.* 1997).

Studies of MJ have been carried out in various cultures (Snarey 1985) but only a few have been conducted in Muslim societies: Maqsood (1977) who reported two studies, one in Pakistan and one in Nigeria; Hemeda in Egypt as reported in Gielen, Ahmed & Avellani (1992); Ahmed, Gielen & Avellani (1987) in Sudan; Bouhmama (1990), Bouhmama (1988), Bouhmama (1984) in Algeria and in the UK; and from the Arabic Gulf region, Ismail (1976) in Saudi Arabia; and, Gielen *et al.* (1992), Al-Ansari (2002) and Al-Shehab (2002) in Kuwait. All the above-mentioned studies were cross-sectional. One author used 'moral judgement interviews' based on moral dilemmas posed by Piaget and three authors on moral dilemmas posed by Kohlberg. The authors of the seven other studies used versions of the DIT (three, five, or six scenarios), making some minor changes to the dilemmas for cultural consideration, and translating the test into Arabic. The subjects of these studies included high school to PhD students

and university faculty members. Results suggest that DIT scores from Muslim societies tend to be lower than the norms from Western societies with diverse religious backgrounds, predominantly at the Kohlberg's stages 2/3 and 4 ('pre-conventional' and 'conventional' levels). Although Bouhmama (1990) reported no significant association between MJ scores and religious attitudes, most authors in this area suggest that individuals with lower DIT scores were 'influenced by their moral ideology ... that adherents to the Muslim religion relied more on divine law for moral decision than on justice as measured within the Kohlbergian framework' (Al-Ansari 2002, p. 79) where 'moral maturity would imply questioning the authority of God' (Al-Shehab 2002, p. 817). Gielen *et al.* (1992) related DIT indices to a measure of Islamic religiosity and Richards & Davison (1992) indicated some doubt of the validity of the DIT for people from some conservative religious cultures. The effect of formal education on MJ development, however, was mixed. None of the studies was conducted with students in a healthcare profession such as physical therapy.

Even within Western societies, although numerous studies of MJ using the DIT have been reported, few studies have been conducted with physical therapy students. In Sweden, Gard & Sundén (2003) studied three cohorts (1996–1998) of physical therapy students ($n = 186$, mean age = 22.9 years) who responded to a questionnaire about life views and ethics in their first and last semester of study, nearly 3 years apart. Fifty per cent of the students were of the opinion that they had changed their life view to a more accepting and tolerant one and that their awareness of ethical issues had been deepened. In the USA, Dieruf (2004) studied two consecutive classes of occupational therapy and physical therapy students ($n = 108$, mean age = 30.6 years) who shared ethics studies. Using the DIT, the author found that the 2-year professional programme did not contribute to further advances in their moral development. More time seemed to be spent on technical skills rather than critical thinking, problem solving and the development of cognitive and reasoning skills. Dieruf (2004) suggested that the students might have reached a plateau given their mature years and advanced level of education on entry to their

programmes; nearly half of them had a degree at the start of their programme. Sisola (2000), however, found that moral reasoning of physical therapy students entering their programme, as measured by the DIT, was a significant, moderate predictor of their clinical performance in their first clinical affiliation. Students' grade point average (GPA) before admission into the physical therapy programme was also significantly correlated with their DIT results.

Cross-cultural issues related to practitioners (and emerging practitioners) have received very little if any attention in the literature. The status and development of MJ in Western and Arabic, Muslim physical therapy students was the object of this investigation.

Method

Subjects

Two cohorts of students were invited to participate in the study. Recruitment consisted of a verbal announcement in class where information on the study was provided and the time and site of data collection was announced. The first cohort was composed of students in the 4-year BScPT (entry-level) programme at the University of Sharjah (UOS), United Arab Emirates (UAE). All of the students in the programme were female. All students were Arabic and English speaking. All students were from an Islamic religious background living in an Arabic culture. The second cohort was composed of male and female students from the 2-year (24 months), second degree, BScPT (entry level) programme at McMaster University (McMaster), Canada. This cohort of students was English speaking. Students were of diverse religious backgrounds, living in a Western culture. The inclusion criteria for both cohorts included: female sex (pre-determined by the UOS cohort); completion of the DIT on entry into (time 1) and/or before completion (time 2) of their respective physical therapy programme; and completion of the physical therapy programme within the requisite time frame of the programme (i.e. 4 years for UOS and 2 years for McMaster). Participation was voluntary and written consent was obtained from all students. Researchers obtained approval from the UOS Research

Committee and McMaster University, Faculty of Health Science, Physiotherapy Program Curriculum Committee to proceed with the study.

The UOS programme was a first university bachelor degree programme, affiliated with McMaster University, with 1 year of basic sciences taught in a traditional format followed by 3 years of professional physical therapy courses. Curriculum was delivered via an adapted problem-based learning (PBL) strategy. Students entered the programme with a high school level diploma. At the start of the UOS programme, students were required to score a minimum of 500 on the TOEFL English proficiency exam. The McMaster programme was offered as a second university bachelor degree that was delivered entirely using PBL. All students entering the programme had at least a 3-year bachelor level degree.

Design

The design of this study was pre-/post-longitudinal and comparative. Two research assistants, one at each location (UOS and McMaster), 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.

Instrument

The DIT was developed in the USA by Rest (1987) as a measure of MJ. The DIT is a group-administered, multiple choice style test that is not time limited. The instrument includes six scenarios, each presenting a moral dilemma. For each scenario, the student must complete three tasks. First, the student selects his/her preferred course of action based on three choices provided. The choices include should do, should not do or cannot decide. Second is to rank the relative importance of 12 statements about the scenario in influencing his/her choice of action. The 12 statements raise different issues related to the moral dilemma of each scenario. The ranking scale uses the labels great, much, some, little or no. Finally, the student selects from the 12 statements, the four most important items for deciding upon the preferred course of action.

All scoring of the DIT is completed by the Center for the Study of Ethical Development at the University of Minnesota. The scoring involves standard reliability checks to eliminate those participants who answer with random responses or meaningless repetition. Scoring of the DIT provides several indices. The P index represents the percentage of 'principled' level of moral reasoning (Kohlberg's stages 5 and 6); a higher P index indicates an individual has a more universal stage of moral development and is a measure of higher moral considerations in making a moral decision (Table 2). Norms have been defined for junior to graduate students, adults and other groups (Rest & Narvaez 1994). More recently, the N2 index, derived from the P index, is the most common way to describe MJ when using this instrument as a result of it providing a more powerful index of MJ (Rest *et al.* 1997). The N2 score ranks responses (similar to the P score), but also rates them based on the degree to which the lower stage statements are rated lower than the statements indicative of the higher stages (Rest *et al.* 1997). N2 norms have also been defined (Bebeau & Thoma 2003).

The validity of the DIT has been assessed in terms of seven criteria (Rest *et al.* 1999a):

- 1 Differentiation of various ages and education groups – 30–50% of variance in DIT scores is attributable to level of education;
- 2 Longitudinal gains – gains in MJ occur over time for college and non-college attendees from diverse walks of life;
- 3 Cognitive capacity measures – the DIT is significantly related to selected cognitive development measures;
- 4 Moral education intervention – one review of over 50 studies reported 'moderate' gains (effect size = .4) for dilemma discussion interventions;
- 5 Professional decision-making – the DIT is significantly linked to 'prosocial' behaviours and desired professional decision-making;
- 6 Political attitudes and cultural ideology – there is a correlation of $r = .40-.65$ between the DIT and correlates of political attitude; and,
- 7 Reliability – Cronbach's alpha and test-re-test reliability is in the upper .70s and low .80s.

The DIT is equally valid for males and females. No other variable or other construct predicts the

pattern of results on the seven validity criteria as well as MJ (Rest *et al.* 1999b).

The DIT was translated in Arabic with the permission of the Center for the Study of Ethical Development, because an Arabic version of the DIT was not available from the Center. The process of translation was conducted as follows: a translator was hired to translate the DIT from English to Arabic and provided the first draft of the instrument. The draft was reviewed by a research assistant who was a UAE national and a healthcare professional and by a professor from the Arabic Department at UOS. Their suggestions were incorporated into the final translation.

Procedures

The procedure used was similar at both universities, with the main difference being that the students at UOS had access to both the English and Arabic translation of the DIT. At UOS, the Arabic translation of the DIT was administered in the middle of the first semester of their professional studies (time 1) and at the end of the last semester of their programme (time 2) approximately 30 months later. On both occasions, the English version of the DIT was also provided to students who requested it and the research assistant reiterated the DIT instructions. Each session lasted approximately 1½ hours. The research assistant transcribed responses from the Arabic translation onto the English DIT forms and assigned a DIT number to identify each subject.

At McMaster, students completed the DIT during their first week within the programme (time 1) and during the last term of academic study, approximately 22 months later (time 2). All testing was carried out in English. Students completed the DIT in 20–40 minutes. Each student independently completed the form and used a DIT number provided by the research assistant.

Students' age, and admission/graduating GPA were obtained from the UOS student transcripts after graduation and from the physical therapy programme at McMaster.

Data analysis

The DIT response sheets were mailed to the Center for the Study of Ethical Development for the initial

analysis. Any scores that failed to meet the subject-reliability checks according to the Center for the Study of Ethical Development or that could not be scored were purged from the next stage of analysis. Within each cohort and between the two cohorts, the entry and exit DIT mean scores were compared using analysis of covariance (ANCOVA) with age and GPA as covariates. Change over time was determined in a similar manner using entry and exit tests from both cohorts for participants who provided data at each time.

Results

Thirteen UOS physical therapy students met the inclusion criteria: 11 completed the DIT at time 1 and 13 completed the DIT at time 2. One student's time 1 results and three students' time 2 results failed the reliability checks and thus were purged from the results. Eight students successfully completed the DIT at both time 1 and time 2 (matched pair results).

Thirty-eight McMaster physical therapy students met the inclusion criteria: 38 completed the DIT at time 1 and 29 completed the DIT at time 2. Three students' time 1 results required purging. Twenty-four students successfully completed the DIT at both time 1 and time 2 (matched pair results).

UOS students were significantly younger on entry into their programme (mean age = 18.5 years, range = 17–20 years) relative to the McMaster students at entry (mean age = 24.9 years, range = 21–30 years; $P < 0.05$). They also had significantly lower GPA at graduation from the physical therapy programme compared to the McMaster students ($P < 0.05$) but the GPA on admission to their programmes did not differ between the two cohorts.

As illustrated in Table 3, McMaster students achieved significantly higher N2 scores on the DIT (average = 51.1) compared with the UOS students (average = 29.9; $P < 0.001$). The mean N2 score for the McMaster students writing at time 1 was 48.8 and was 53.9 at time 2. On the other hand, the UOS mean was similar at time 1 (30.8) and at time 2 (29.0).

When analysing the matched pair scores for change over time, McMaster students scored significantly higher after completing their physical therapy

Table 3 Mean (and standard deviation) of N2 score for all McMaster and UOS students with DIT score at time 1 or time 2

Cohort	Time 1 mean	Time 2 mean	Average time 1 and 2
McMaster	48.8 (11.1) N = 35	53.9 (10.6) N = 29	51.1
UOS	30.8 (5.7) N = 10	29.0 (12.6) N = 10	29.9

McMaster, 2nd degree BScPT students at McMaster University, Canada; UOS, 4-year BScPT students at University of Sharjah (UOS), United Arab Emirates (UAE); *N*, number.

Table 4 Mean of N2 score for McMaster and UOS students whose time 1 scores could be matched to time 2 scores

Cohort	<i>N</i>	Time 1 mean	Time 2 mean
McMaster	24	47.5	54.9
UOS	8	29.1	27.4

McMaster, 2nd degree BScPT students at McMaster University, Canada; UOS, 4-year BScPT students at University of Sharjah (UOS), United Arab Emirates (UAE); *N*, number.

programme relative to their results on entry into the programme (time 1 mean = 47.5; time 2 mean = 54.9; $P < 0.01$). UOS students, in contrast, did not demonstrate improvement (time 1 mean = 29.1; time 2 mean = 27.4; $P > 0.6$) (Table 4). Adjusting for age and GPA had no effect on these results.

Discussion

Physical therapy students from Western (Canada) and Arabic, Muslim (UAE) cultures demonstrated significantly different scores on the DIT over the period of their professional programmes. Even upon controlling for age and GPA, the DIT scores of McMaster students were higher than UOS students at both entry to and exit from their programmes.

On admission to their physical therapy programmes, both cohorts of students were close to the expected level of moral reasoning associated to their age and years of formal education based on Bebeau &

Thoma's (2003) normative values. UOS students were teenagers who had completed high school; they scored near the high school level, N2 norm value of 31.7 (SD \pm 17.2). McMaster students were young adults entering their second bachelor degree programme; they scored above the college level, N2 norm value of 36.9 (SD \pm 15.53). According to the Kohlbergian framework (Table 2), on entry into their programmes, UOS and McMaster students were within the 'conventional' level (stages 3–4) of moral reasoning.

Over the 22-month interval between time 1 and time 2, McMaster students significantly increased their DIT scores demonstrating a 'principled' level of moral reasoning (stages 5–6). They moved from a college level to a graduate level, N2 norm of 49.0 (SD \pm 15.6). The N2 scores achieved by the McMaster students were comparable to a higher level of education than that which the McMaster students obtained (i.e. a second bachelor degree). Over the comparable 30-month period of professional studies, however, UOS students maintained a similar DIT score to admission, continuing at a 'conventional' level of moral reasoning.

These results, however, should be interpreted cautiously. DIT norms are based on subjects from the USA; there are no comparisons available between UOS students and age-matched peers not enrolled in post-secondary education. Furthermore, the students' educational experiences may in part explain the significant differences between the two cohorts. UOS students were novice to the university environment while McMaster students were engaged in their second university degree. In addition, UOS students were less likely to have participated in or conducted research projects and consequently, may have had less interest and willingness to sustain their attention throughout a series of challenging cognitive operations, as mentioned in Gielen *et al.* (1992).

More importantly, the findings of the current study concur with previous cross-sectional studies conducted in different Muslim societies. The DIT scores were lower than their Western counterparts and/or remained at the same level despite increasing level of formal education. Bouhmama (1988) investigated 90 students from various Muslim countries, from high school to doctorate level, and found no

significant difference in the DIT scores across the different levels of education. Gielen *et al.* (1992) studied 313 Muslim students, aged 15 to 26 years, from intermediate school to university, and reported that age and education were not consistently related to DIT indices of 'moral maturity'. Kohlberg's stage 3 predominated in all groups. Al-Shehab (2002) analysed the DIT scores of 86 full-time PhD faculty members from diverse disciplines. The scores were lower than the norms, at stage 4, and were not related to the subjects' age or discipline. The current study adds a professional training context to this emerging body of literature.

In completing the DIT, the UOS students may have been governed by Islamic principles over cognitive processes of justice principles as measured by the Kohlbergian framework (Al-Ansari 2002; Al-Shehab 2002). For this group of students, some DIT items may have represented a different construct or had a different meaning, and may have been viewed as going against Islamic laws, similar to Richards & Davison's (1992) analysis of Mormon subjects. For example, one of the DIT scenarios, titled 'Doctor's dilemma', raises the ethical concept of euthanasia. The students may have not considered scenarios like this one to be ethical dilemmas (i.e. situations in which a decision on a course of action is required to resolve the conflict) because principles of Islam may make the appropriate action clear. Halstead (2004) described the social and moral dimension of education in Islam as

'... a matter of coming to understand and learning to follow the divine law, which contains not only universal moral principles (such as equality, justice and charity), but also detailed instructions relating to every aspects of human life ... The divine revelation ... provides them with the requisite knowledge of ... right and wrong, and the task of individuals is to come to understand this knowledge and exercise their free will to choose which path to follow ... The pursuit of knowledge should stimulate the moral and spiritual consciousness and lead to faith. The effect ... is to play down the importance of certain skills within education such as questioning, criticizing, and making judgements in favour of uncritical acceptance of authority' (pp. 523–526).

Although the idea of 'development' is accepted by some scholars, the use of human reason as part of

Islamic decision-making remains a struggle among the Islamic community (Metzger 1994–1995).

McMaster students, on the other hand, represented a multi-cultural context with a more heterogeneous religious affiliation. They may have experienced a more liberal view of religious freedom and personal autonomy, embedded in developmental cognitive processes, and may have been more likely to embrace justice expectations in moral conflict situations associated with North American beliefs and values (Miller & Bersoff 1992). Overall, the students' religious orientations were likely affected by their total educational environment as well as sub-settings (i.e. residences, friendship circles, extracurricular activities, socio-economic status, religious affiliation and gender) (Feldman 1969, 1970; Derryberry & Thoma 2000).

Thus, the authors of this study question the principle of universality of MJ as measured by the DIT and advocate for more elaborated moral dilemmas than found in the DIT, with culturally specific examples of moral principles from diverse cultures (Al-Ansari 2002). Universal aspects of MJ are closely linked with culture-specific elements (Gielen *et al.* 1992). A different framework is needed for understanding MJ based on premises other than the Western, developmental cognitive paradigm and taking culture and religion into account (Al-Shehab 2002). Different cultural systems have different moral codes; views about what is ethical vary by cultural group and mechanisms for addressing ethically problematic situations are culturally specific (Muller 1994).

The small sample of subjects in this study, particularly in the UOS group, was not a limitation per se as the large differences in DIT scores between the cohorts enabled sufficient power to achieve statistical significance despite the low numbers. One may argue, however, that the 10 students whose results are included in this study are not representative of all UAE students. Attrition rates of 8% (McMaster) and 9–23% (UOS) were related to random, incomplete or incorrect completion of the form. The standard DIT 'Consistency Test' served as a validity check. Some authors have indicated that the DIT is a difficult and unusual test for students from Arab nations (Bouhmama 1988; Gielen *et al.* 1992). The

translation of the DIT in Arabic may have added to the difficulty in the current and previous studies. UOS students expressed difficulty with the complexity of the language and the instructions of the test. Some students used the English and Arabic versions in an attempt to comprehend the text despite the fact that the Arabic translation was reviewed by UAE nationals. Spoken Arabic varies among countries and regions. Small differences in translation can have dramatic effects on the results (Perez-Delgado & Oliver 1995) and differences in word choice can make a difference on the DIT results (Rest 1986). The Arabic version of the DIT would require further analysis with regard to its cultural sensitivity, logistical administration and psychometric properties.

The findings of this study have implications for physical therapy educational programmes in countries with increasingly diverse student populations. Ethics educators need to be aware of the process related to the development of MJ from within the particular perspective of the students' culture in order to effectively develop and adapt their curricula. Educators may gain greater awareness through participation in cultural and MJ workshops. They should explore literature on MJ written by authors of different cultures, engage in open-discussion groups and apply this information to curriculum development. Students could be actively involved in designing moral dilemma scenarios with open-ended questions, using different cultural perspectives and based on their clinical affiliation experiences. Curriculum revision is typically based on students' performance outcomes. Therefore, it is imperative to measure students' characteristics and change over time, and to ensure instruments' applicability.

Future research might consider cross-cultural variations in ethical principles, the qualitative change of MJ, the level of MJ of educators from different cultures (Al-Shehab 2002) as well as the link between moral reasoning and the behaviour of practicing clinicians in ways that are directly related to patient care (Sisola 2000).

Conclusion

DIT scores, broadly believed to be a measure of moral judgement, were significantly different in

groups of physical therapy students from a Western and an Arabic, Muslim university. DIT scores of McMaster students were higher than UOS students at both admission and exit of their respective PBL-based, entry-level, professional programmes. At admission, both cohorts revealed a level of MJ consistent with norms based upon age and level of formal education. Only McMaster students, however, demonstrated significant change in their DIT scores over time. Adjusting for age and GPA had no effect on the results. These findings question the validity of the DIT with regard to appropriateness as a measure of moral development across cultural contexts. Further research is needed to validate the DIT's cultural sensitivity within the Arabic, Muslim societies, to guide its interpretation, and to investigate the process of development of MJ in physical therapy education and practice.

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Conflict of Interest Statement

None of the authors has any commercial or financial association that might pose a conflict of interest in connection with this submitted manuscript.

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