RESEARCH

Assessment of Moral Development among Pharmacy Students and Alumni: Implications for Pharmacy Education

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Objective. This study's principal aim was to assess the moral development of undergraduate pharmacy students and alumni at a university in Jordan.

Methods. Using the Professional Ethics in Pharmacy (PEP) test, 512 pharmacy students' and alumni's moral reasoning was assessed in a cross-sectional design.

Results. The response rate was 49%. The P-score median was 16.7, with no statistical difference observed across all five cohorts. No statistically significant differences in medians P-score between males and females were found (16.7 versus 20, respectively). Also, no statistically significant differences in medians P-scores were observed between students who have completed the ethics course against those who have not completed the ethics course at the time of data collection (median P-score 20 versus 16.7 respectively). No trends in median P-scores were observed, and there were no statistically significant differences in P-scores among the five cohorts.

Conclusion. Professional moral reasoning of prospective pharmacists in this study was lower than expected. A further longitudinal study of the cohort, which attempts to correlate moral development with age, sex, education level, and moral education strategy, is warranted.

Keywords: moral development; pharmacy students; moral reasoning

INTRODUCTION

Moral reasoning is a cognitive process that drives individual decision-making in an attempt to harmonize an individual's initial judgment and moral reaction to an ethical dilemma.¹ In the late 60s, Kohlberg developed the Cognitive Moral Development theory (CMD) that addresses how people think and the process of arriving at decisions. Kohlberg described three levels with six stages of cognitive moral development, consisting of a pre-conventional level (cognitive stages one and two), a conventional level (cognitive stages three and four), and a post-conventional (or principled) level (cognitive stages five and six). Self-centered interests dominate the pre-conventional level. At the conventional level, relationships with others become more important; a person determines 'right' by conforming to society's norms. At the post-conventional level, universal moral principles guide decision-making, even if this means violating a law in the process.

The Defining Issues Test (DIT) is the most widely used moral reasoning test based on Kohlberg's CMD theory.^{2,3} However, its language, and dilemmas became somewhat outdated.⁴ Therefore, the revised short version DIT-2 is currently widely used in research and played a significant role in shaping the relationship between participation in higher education and moral reasoning development in college students.^{3,4} The short-form DIT-2 consists of three moral dilemmas.^{5,6} Each dilemma is followed by a series of 12 statements relating to the dilemma, most of which representing the six cognitive stages posited by Kohlberg's CMD theory.^{5,6} The individual's task is to rate and rank the 12 items in order of importance. The most widely used DIT-2 score is the P-score, representing the percentage of an individual's overall moral functioning at the post-conventional level.

Teaching moral reasoning is challenging yet could be developed in students.⁷⁻¹⁰ In a pre-and post-research design using the DIT, Penn identified that students' principled moral reasoning could be achieved and improved by directly teaching the component skills of moral reasoning, cognitive skills of logic, practicing role-taking, and justice operations.¹¹ Rest conducted a review of 57 moral reasoning studies concerning educational interventions' effect on moral reasoning development.¹² He concluded that peer discussion of ethical dilemmas allows students to engage in higher levels of moral discussions made by their peers.¹² Previous researches also suggested that peer discussion of

ethical cases in health care ethics courses would have potentially improved moral reasoning scores because students would have the opportunity to learn from peers by practicing moral problem-solving skills.^{8,12–16} These findings were consistent with those reported by Self et al. who successfully integrated a small-group case study discussion throughout the medical ethics curriculum.¹⁷ The authors evaluated the impact of this educational intervention on the moral reasoning development of a large sample of medical students in a before-after study design and observed a significant mean increase in pre-and post-course DIT P-scores.¹⁷ Collectively, these studies and several others provide strong evidence that participation in formal education promotes moral reasoning development among undergraduate students. Thus, there appears to be a moral curriculum in higher education.¹⁸

In terms of professional role, there are moral considerations present that are profession-specific and are different from those acting as individuals due to the different normative ethical principles applicable to a profession.¹⁹ Therefore, the use of test derived from real-life, profession-specific scenario may work better than hypothetical scenarios, as is the case with the DIT.²⁰ Moral reasoning development has been measured in pharmacy among both undergraduate students and practicing pharmacists, predominantly in the United States of America (USA) and mainly with the DIT. Most pharmacy students' studies ranked low in moral reasoning skills reflect the inability of the DIT and DIT-2 tests to measure profession-specific concept.^{13,19,21–25} In the United Kingdom (UK), Prescott et al. and Hanna et al. using a longitudinal design, they utilized the DIT-2 to measure moral reasoning development amongst pharmacy students in UK schools of pharmacy and found a significant decrease in the mean P-score for all students compared to the mean scores of US pharmacy students and other US health care students. On this basis, many researchers have taken the step to develop profession-specific tests of moral reasoning.^{26–28}

A pharmacy-specific instrument to measure levels of cognitive moral development and reasoning skills in professional ethics would be fundamental. Thus, Chaar developed the Professional Ethics in Pharmacy (PEP) test from the context of Australian community pharmacy practice. The PEP test measures moral understanding related to professional autonomy, competence, informed consent, confidentiality, and whistle-blowing that can be used in teaching ethics in professional courses.^{20,29} However, the DIT measures moral understanding based on justice, social cooperation, and fairness.²⁹

The PEP test had previously been used in Australia, where the tool originated,²⁰ and in a pharmacy school in the UK.³⁰ Chaar applied the PEP test to fourth-year Australian pharmacy students before and after a teaching intervention. With an initial average P-score of 42.0, it was increasing to 50.6 ($t(156) = 11.48, p = .001$), a statistically significant improvement of 8.633. The scores obtained by Chaar were higher than the average P-scores from the UK study (ie, year 1 P-score = 31.4; year 4 P-score = 35.1) showing a positive trend of increase in the average P-scores was observed from year one to year four for undergraduate students.

The primary aim of this study was to assess the moral development of undergraduate pharmacy students through their academic years as they progress from year three through the final year at a school of pharmacy in Jordan with the purpose to expand the research findings by assessing a cause-and-effect relationship between moral development and ethics teaching.

METHODS

The PEP test was constructed around three pharmacy-specific scenarios providing real-life examples of dilemmas experienced by pharmacists.³¹ Each scenario is followed by 12 statements. Of the 36 statements in total, 30 statements represent a stage of cognitive moral judgment. Six meaningless statements were included among the three scenarios to correct respondents providing socially desirable answers.¹⁸ If participants ranked more than three meaningless statements, their questionnaires were therefore discarded. For each scenario, respondents have to rate and rank the statements. A P-score is a measure of higher-level principled thinking. It is calculated by assigning points to ranking data and then summing the number of times respondents rank post-conventional statements of Kohlberg's model as first, second, third, and fourth most important as follow: four points to the highest-ranked statement to one point to the fourth-ranked statement. Typically, the P-score is calculated by dividing the total number of points across the three dilemmas by 30 (the total number of points) when there is no missing.^{32,33}

The PEP test is a pre-validated tool, and, therefore, its reliability and validity are already established.³¹ Consequently, it was not necessary to conduct a pilot study, but the questionnaire was assessed for face validity by two Jordanian practicing pharmacists to assess if the questionnaire content made sense in the Jordanian pharmacy setting. Permission to use the PEP test was granted by contacting the author directly.

Data Collection and Data Analysis

The target population for this study was pharmacy and Doctor of Pharmacy (PharmD) bachelor degree students and pharmacy alumni from the school of pharmacy at the University of Jordan, Jordan. Ethics is taught in a classroom as a standalone subject named "Pharmacy Regulations and Ethics" as a one-credit course runs over 16 weeks and taught by staff from the school itself. The course syllabus covers law, ethics, and regulatory issues as not

any other courses address any aspects of ethics during their college. Assessment of learning is undertaken via theory-based multiple-choice questions. The course is available for students from both programs to study at any level, starting from the third year of study.

The study was conducted during the 2019-2020 academic year. As the focus of this study was the impact of teaching intervention throughout each year of undergraduate education, the enrolled students were in the academic years; three, four, five, and final years. The students' number was distributed as the following: 254 from third-year pharmacy and PharmD, 330 from fourth-year pharmacy and PharmD, 149 from fifth-year PharmD, and 280 from final-year pharmacy and PharmD. Additionally, 150 early-career pharmacists graduated within the previous three academic years (2016 to 2019), whose contact details were available and registered at the Jordan Pharmacists Association (JPA) and asked for their voluntary participation in the study.

Two weeks before the scheduled sessions, an email was sent to early-career pharmacists and all year three, four, five, and final year students from pharmacy and PharmD programs providing a brief description of the research, with the participant information sheet attached. Participants were invited to attend a pre-defined scheduled session. Written informed consent was obtained from all participants who were assured of data confidentiality, their right to withdraw at any time, and asked to complete the PEP test individually.

Data were collected using a self-completed questionnaire consisting of two sections: section A gathered non-identifiable demographic information, specifically; current primary role, gender, age-range, and completing ethics course or not. Section B contained the PEP test.

The P-score was calculated and checked for each returned questionnaire by two researchers. Responses were coded and entered into the SPSS [IBM Statistical Package for the Social Sciences Statistics for Windows, Version 24.0. Armonk, NY] for statistical analysis. The analysis involved comparing average P-scores amongst the five cohort groups against demographics. As P-scores represented continuous data, they were initially tested for normal distribution relying on both statistical tests and visual inspection of graphs and plots. Descriptive statistical tests were then applied to the data to calculate means, median, standard deviations of P-scores for each group, ie, age, sex, and individual year groups. Inferential statistical tests were then applied to test for any associations. Pearson's chi-square goodness-of-fit test was applied to the data to determine whether participants' distribution in a single categorical variable (ie, gender, age group, completing ethics course or not) are equal or unequal. The Mann-Whitney U test was used to compare median P-scores of all cohort groups combined against the demographic variables gender and between cohort groups who have completed ethics course against cohort group who have not completed the ethics course at the time of data collection. The Kruskal-Wallis H test was used to understand whether P-scores differed based on participants' age-range. If significant differences were identified, the next step was to undertake a post hoc test to determine which of these groups differ from each other. The Jonckheere-Terpstra test was used to test for an ordered difference in medians P-scores with higher levels of the year of study (from "third-year students", "fourth-year students", "fifth-year students", "final-year students" to "early-career pharmacists") to state the direction of this order. Ethical approval for this study was granted by the University of Jordan's Research Ethics Committee of the School of Pharmacy. All participants gave written informed consent. No personal identifying data was collected during the study.

RESULTS

The P-scores demonstrated deviation from a typical bell-shaped graph. A skew value of .769 and a standard error of .108 were found; a distribution skewed to the right (positive skewness). A kurtosis score of .872 and a standard error of .215 also supported deviation from the normal distribution. Tests of Kolmogorov-Smirnov and Shapiro-Wilk of $p = .00$ suggested that the data were not approximately normally distributed. The data were found to violate the assumptions for normality; therefore, non-parametric statistical tests were applied to the data, and it seemed that outliers do exist; however, this did not affect the normality results. A non-parametric Levene's test was used to verify the equality of variances in the samples (homogeneity of variance; $p = .23$).³⁴

A total of 565 participants returned a PEP test questionnaire. Forty were incomplete, and 13 were unsuitable for analysis; therefore, 512 were analyzed. The overall response rate was approximately 49%. All the alumni who responded worked in community pharmacy. Demographic information of participants is summarised in Table 1. A descriptive analysis revealed that the sample constitutes of 99 students from year three (19.3%), 131 from year four (25.6%), 101 from year five (19.7%), 103 from the final year (20.1%), and 78 early-career pharmacists (15.2%). The majority of the respondents ($N=428$, 83.6%) were female students and in the age range between 21 and 25 years ($N=403$, 78.7%). Approximately half of the respondents ($N=265$, 51.8%) have completed their ethics course at data collection time. A statistically significant difference in gender and age range was found among all study cohort groups (Chi-square 231.13, $p = .0$, Chi-square 1461.48, $p = .0$, respectively). However, a statistically insignificant difference in completing the ethics course was found among the groups (Chi-square .945, $p = .331$).

Comparing P-scores across Demographics

Table 2 shows the spread of P-scores achieved. Specifically, it compares the minimum, maximum, and median of P-scores across all five cohort groups. The P-score median was 16.7, and there was no statistical difference observed across all five cohort groups ($p=.112$), indicating that students' moral development did not change during the academic years.

A Mann-Whitney U test was run to determine if there were differences in P-scores between males and females and found no statistically significant difference between the P-scores and gender (20 for female students and 16.7 for male students; $p=.181$). No statistically significant differences in median P-scores were observed between cohort group who have completed ethics course against cohort group who have not completed the ethics course at the time of data collection (median P-score 20 versus 16.7 respectively, $p=.629$).

Kruskal-Wallis test was conducted to examine the differences in median P-score according to the year of study of research participants. Statistically significant differences (Kruskal-Wallis $H=16.240$, $p=.003$, $df=4$) were found among the five cohort groups. A post hoc test was conducted to compare all pairs of groups (pairwise comparisons) and showed that the difference in P-scores between final year students and early-career pharmacists is statistically significant (median P-score 20 versus 13.3 respectively, $p=.003$). However, Kruskal-Wallis H test did not show a statistically significant difference in P-scores between the six different age groups (Kruskal-Wallis $H=4.439$, $p=.488$, $df=5$) (<20, 21-25, 26-30, 31-35, 36-40 and >41).

A Jonckheere-Terpstra test for ordered alternatives demonstrated that there was not a statistically significant trend of increase in the median of P-scores with higher levels of the year of study (from third-year students to early-career pharmacists), Jonckheere-Terpstra test statistic (TJT)=50640.500, $z=-.760$, $p=.447$.

DISCUSSION

The P-scores achieved by early-career pharmacists were found to be consistently lower than undergraduate students suggest that the moral reasoning skills of alumni decreased when they left the university environment and that undergraduate teaching did not impact professional practice. It could also reflect the complexities of decision-making beyond the academic classroom's safety, indicating that community pharmacists are subject to the working conditions and requirements set by their employing organization. Funding cuts and increasing pressures to meet targets and achieve profits can, arguably, make it difficult at times to perform at the post-conventional level of Kohlberg's model.³⁵

This research suggests that pharmacy students' age and gender were not significantly related to P-score and are less likely to affect moral reasoning scores among research participants. Two studies using the PEP test (Chaar; Allinson and Black) are consistent with the findings and reported that no significant differences were found in P-scores of males versus females and between different age groups.^{20,30} Likewise, Murphy and Rest found that only two of 22 studies measuring moral reasoning reported a significant difference in gender P-scores.³³ Furthermore, studies that used age to predict moral reasoning scores among traditionally aged college students found no significant relationship between age and moral reasoning on the DIT.^{36,37} However, many studies focused on questions relating to gender differences in moral reasoning found that females scored significantly higher than males on the DIT.^{13,21,38-40} Findings from this research demonstrated that there was not a statistically significant trend of increase in the median of P-scores with higher levels of the year of study. These findings could suggest that there is minimal professional ethics teaching delivered. A series of longitudinal studies examined the effects of age and education on moral reasoning development showed that students' use of conventional level reasoning decreased during college, and their use of post-conventional level reasoning increased,⁴¹⁻⁴⁷ offering evidence that education experiences promote the development of moral reasoning among undergraduate students. Moreover, a series of consecutive studies conducted by Rest and Rest and Thoma investigated whether gains in moral reasoning are due to education, age, or the interaction between them showed that formal education is the most powerful demographic correlate of DIT P-scores.^{38,48}

Given the low overall scores obtained from this study, considerations should be given to address this, given the strong association between moral reasoning development and education. This data provides evidence that teaching ethics courses at the School of Pharmacy, falls below the professional expectations and highlights a need for reform of teaching methods within the pharmacy ethics curriculum with the ultimate objectives to improve students' moral attitude, prepare students for medical ethics issues, and develop ethical reasoning skills.^{7,8,10,49} The proposed reform suggests a longitudinal integration of ethics and professionalism education in all phases of undergraduate education.^{9,41-48} A learning approach that focuses on bridging the theory-practice gap and integrating academic knowledge into real-world practice would have the potential to encourage moral reasoning skills development.⁴⁹

There are several limitations to this study. The current study used a cross-sectional design to assess moral development. The study was limited to one institution, so results could not be generalised to other Jordan schools of pharmacy. Another limitation of the study is that the participating pharmacists were early in their careers and therefore

not representative of the pharmacist population in general. With the changing role of the pharmacist with the move towards more patient-centred function, this research's findings provide a unique contribution to the existing moral reasoning research literature.

CONCLUSION

This research provides empirical data on the moral development of potential future pharmacists. The results of this study will be used as a starting point for a longitudinal study of a single cohort of pharmacy students, using the PEP test, and will seek to demonstrate a causal link between ethics teaching and the increase in moral development. If those studies' results replicate the present findings, it would seem prudent to re-form pharmacy curricula to maximize moral development through strategies discussed earlier in the discussion section.

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Table 1. Demographics of Participants and P-Score of Study Cohort Groups

		Year Three N=99	Year Four N=131	Year Five N=101	Final Year N=103	Pharmacists N=78	Total N=512
Gender	Male N (% Within Gender)	23 (27.4)	16 (19.0)	4 (4.8)	5 (6.0)	36 (42.9)	84 (16.4)
	Female N (% Within Gender)	76 (17.8)	115 (26.9)	97 (22.7)	98 (22.9)	42 (9.8)	428 (83.6)
		<i>p value < .0</i>					
Age Range	<20 Years N (% Within Groups)	66 (66.7)	3 (2.3)	0 (.0)	0 (.0)	0 (.0)	69 (13.5)
	21-25 Years N (% Within Groups)	33 (33.3)	126 (96.2)	101 (100)	102 (99)	41 (52.6)	403 (78.7)
	26-30 Years N (% Within Groups)	0 (.0)	2 (1.5)	0 (.0)	1 (1)	32 (41)	35 (6.8)
	31-35 Years N (% Within Groups)	0 (.0)	0 (.0)	0 (.0)	0 (.0)	2 (.4)	2 (.4)
	36-40 Years N (% Within Groups)	0 (.0)	0 (.0)	0 (.0)	0 (.0)	2 (.4)	2 (.4)
	>41 Years N (% Within Groups)	0 (.0)	0 (.0)	0 (.0)	0 (.0)	1 (.2)	1 (.2)
		<i>p value < .0</i>					
Studied Ethics Course	Yes; N (% Within Groups)	0 (.0)	40 (30.5)	75 (74.3)	74 (71.8)	78 (100)	265 (51.8)
	No; N (% Within Groups)	99 (100)	91 (69.5)	26 (25.7)	29 (28.2)	0 (.0)	247 (48.2)
		<i>p value < .331</i>					

Table 2. Spread and Median P-Scores of Study Cohort Groups

P-score	Year Three N=99	Year Four N=131	Year Five N=101	Final Year N=103	Pharmacists N=78	Total N=512
Minimum	.0	.0	.0	.0	.0	.0
Maximum	46.7	60	63.3	60	36.7	63.3
Median	20	16.7	20	20	13.3	16.7

p value=.112