

Evaluating Moral Development in Undergraduate Pharmacy Students and Graduates

Jorge L. Ramirez¹, Ana P. Morales^{1*}, Lucia F. Soto¹

¹Department of Pharmacy Practice, Faculty of Pharmacy, University of Costa Rica, San Jose, Costa Rica.

*E-mail ✉ ana.morales@outlook.com

Abstract

The main goal of this research was to evaluate the ethical growth in moral judgment among pharmacy undergraduates and graduates at a Jordanian university. A cross-sectional approach was employed to examine the ethical decision-making abilities of 512 pharmacy students and graduates using the Professional Ethics in Pharmacy (PEP) instrument. The key metric was the Principled Morality Score, expressed as a percentage indicating the extent of advanced moral judgment, with elevated scores signifying higher levels of ethical maturity. Among participants, the participation level reached 49%. The overall median Principled Morality Score stood at 16.7, showing consistency without notable variations across the five student groups. Gender comparisons revealed no meaningful distinctions in median scores (16.7 for males versus 20 for females). Similarly, completion of an ethics curriculum did not yield significant differences (median scores of 20 for those who finished the course compared to 16.7 for others). No patterns of change were detected in the scores over time. The findings indicate that future pharmacists in this sample exhibited lower-than-anticipated levels of professional ethical reasoning. It is recommended to conduct a future longitudinal investigation tracking one group over time, exploring potential links between ethical growth and variables such as age, gender, academic progression, and approaches to ethics instruction.

Keywords: Moral development, Pharmacy students, Moral reasoning, Ethical growth

Introduction

Ethical decision-making involves a thinking process that helps individuals balance their initial responses and judgments when facing moral challenges, aiming to reach appropriate conclusions [1]. In the late 1960s, Kohlberg introduced a theory of cognitive ethical development, outlining how individuals reason and make choices [1]. This framework includes three primary levels comprising six stages: the preconventional level (stages one and two), where personal gains predominate; the conventional level (stages three and four), emphasizing adherence to social expectations and relationships; and the postconventional level (stages five and six), guided

by broader ethical principles that may transcend specific rules or laws.

The Defining Issues Test (DIT) has been a prominent tool grounded in Kohlberg's framework for assessing ethical reasoning [2, 3]. However, its scenarios and wording have aged, leading to the adoption of the shorter DIT-2 version in many studies to explore how university education influences ethical growth in students [3, 4]. The abbreviated DIT-2 presents three ethical scenarios, each accompanied by 12 items reflecting Kohlberg's stages [5, 6]. Participants evaluate and prioritize these items, and the primary indicator, the Principled Morality Score, calculates the proportion of reasoning at the postconventional stage.

Developing ethical reasoning skills is difficult but achievable through education [7-10]. Research by Penn demonstrated enhancements in principled thinking by teaching logical reasoning, role-playing, and justice concepts in a before-and-after study using the DIT [11]. Rest's analysis of numerous intervention studies highlighted the benefits of group discussions on moral

Access this article online

<https://smerpub.com/>

Received: 17 February 2023; Accepted: 05 June 2024

Copyright CC BY-NC-SA 4.0

How to cite this article: Ramirez JL, Morales AP, Soto LF. Evaluating Moral Development in Undergraduate Pharmacy Students and Graduates. Ann Pharm Educ Saf Public Health Advocacy. 2024;4(1):115-21. <https://doi.org/10.51847/pJPiL9goET>

issues [12]. Similar work has shown that analyzing case studies in healthcare ethics classes, through peer interactions, can elevate reasoning abilities by allowing practice in ethical analysis [8, 12-16]. This aligns with efforts by Self *et al.*, who incorporated small-group discussions into a medical ethics program, resulting in notable gains in DIT scores post-intervention in a large student sample [17]. Overall, substantial evidence supports that structured higher education fosters ethical advancement, suggesting an implicit ethical component in college curricula [18].

In professional contexts, ethical issues often differ from personal ones due to occupation-specific norms [19]. Thus, tools using real-world professional scenarios may better capture practitioners' reasoning than general hypothetical ones like the DIT [20]. Prior studies on pharmacy ethical development, mostly in the US using the DIT, have indicated relatively low scores, partly attributed to the test's lack of profession-relevant content [13, 19, 21-25]. In the UK, longitudinal research with DIT-2 revealed declining scores among pharmacy students compared to American counterparts [26-28].

To address this, a tailored assessment for pharmacy is essential. Chaar created the Professional Ethics in Pharmacy (PEP) test based on Australian community pharmacy experiences, focusing on areas like professional independence, competency, patient agreement, privacy, and reporting concerns, suitable for ethics training [20, 29]. Unlike the DIT's emphasis on broader concepts like fairness and cooperation, the PEP targets pharmacy-specific ethics [29].

The PEP has been applied in its origin country, Australia [20], and one UK pharmacy program [30]. In Chaar's work, Australian final-year students showed an average score rise from 42.0 to 50.6 following targeted teaching, a statistically meaningful gain. UK results were lower (31.4 for first-year and 35.1 for fourth-year students) but indicated upward progression.

This investigation primarily sought to examine ethical advancement in pharmacy undergraduates across later years at a Jordanian pharmacy school, aiming to build on prior work by exploring potential causal links between ethics education and moral growth.

Materials and Methods

The Professional Ethics in Pharmacy (PEP) instrument consists of three realistic scenarios drawn from everyday challenges encountered by pharmacists [31]. Following

each scenario are 12 items. Across all three scenarios, 36 items in total, 30 correspond to specific stages of cognitive moral development. To account for potential socially desirable responding, six nonsensical items were distributed among the scenarios [18]. Questionnaires in which more than three of these nonsensical items were highly ranked were excluded from analysis. For every scenario, participants were required to rate the importance of each item and then rank them in order of significance. The Principled Morality Score, which indicates the extent of advanced postconventional reasoning, is derived by weighting the rankings of items aligned with Kohlberg's higher stages: four points for the top-ranked item, three for the second, two for the third, and one for the fourth. The total weighted points from the three scenarios are typically divided by 30 (the maximum possible points with complete responses) and expressed as a percentage [32, 33].

The PEP test has undergone prior validation, establishing its reliability and validity [31]. Accordingly, no pilot testing was required, though two experienced pharmacists in Jordan reviewed the instrument for contextual relevance and face validity in the local practice environment. Authorization to utilize the PEP test was obtained directly from its developer.

The study population included students enrolled in the Bachelor of Pharmacy and Doctor of Pharmacy (PharmD) programs, as well as recent alumni, at the School of Pharmacy, University of Jordan. Ethics instruction is delivered as a dedicated one-credit course titled Pharmacy Regulations and Ethics, spanning 16 weeks and taught by faculty members. The curriculum addresses legal, ethical, and regulatory topics, with no ethics content covered elsewhere in the programs. The course is optional for students in either program starting from their third year and is assessed through multiple-choice examinations.

Data collection occurred during the 2019-2020 academic year. To evaluate the influence of progressive education on ethical reasoning, participants were drawn from third-, fourth-, fifth-, and final-year students. Enrollment figures for these levels were: 254 in third year (pharmacy and PharmD combined), 330 in fourth year, 149 in fifth-year PharmD, and 280 in final-year pharmacy and PharmD. Additionally, 150 recent graduates (from 2016-2019) registered with the Jordan Pharmacists Association and with available contact information were invited to participate voluntarily.

Invitations were emailed two weeks prior to designated sessions to all eligible students and alumni, including a study overview and participant information sheet. Attendance at scheduled sessions was voluntary, and written informed consent was secured from all who participated. Participants were guaranteed confidentiality, the option to withdraw anytime, and were instructed to complete the PEP test independently.

The questionnaire comprised two parts: Section A collected anonymous demographic details, including current role, gender, age, and completion status of the ethics course; Section B presented the PEP test.

Each completed questionnaire was independently scored by two researchers to compute the Principled Morality Score. Data were entered into SPSS version 24 (IBM Corp) for analysis. Scores were compared across the five groups (third year, fourth year, fifth year, final year, and alumni) and demographic categories. Given the continuous nature of the scores, normality was assessed through visual plots and formal tests. Descriptive statistics (means, medians, standard deviations) were generated for subgroups by age, gender, year of study, and ethics course completion. For inferential analysis, chi-square goodness-of-fit tests evaluated distribution equity for categorical variables (gender, age group, ethics course status). Median comparisons used the Mann-Whitney U test for gender and ethics course completion effects, while the Kruskal-Wallis test examined differences across age groups, followed by post hoc

analysis if needed. The Jonckheere-Terpstra test assessed trends in median scores across academic years.

The study received ethical approval from the Research Ethics Committee at the University of Jordan's School of Pharmacy. Written informed consent was obtained from all participants, and no identifiable personal information was gathered.

Results and Discussion

Examination of the Principled Morality Scores revealed a non-normal distribution, departing from a symmetric bell curve. The skewness was 0.77 (standard error 0.11), indicating positive (rightward) skew, and kurtosis was 0.87 (standard error 0.22), further confirming deviation from normality. Both Kolmogorov-Smirnov and Shapiro-Wilk tests yielded $p < .001$, rejecting normality. Consequently, nonparametric approaches were employed. Although outliers were present, they did not alter normality conclusions. A nonparametric Levene test confirmed homogeneity of variances across samples ($p = .23$) [34].

Of the returned questionnaires, 565 were received. Forty were incomplete, and 13 were deemed invalid, leaving 512 for analysis, corresponding to a response rate of about 49%. All participating alumni were employed in community pharmacy settings. Participant demographics are detailed in **Table 1**.

Table 1. Demographics of participants who completed the professional ethics in pharmacy questionnaire, N=512

Demographic	Year three n599	Year four n5131	Year five n5101	Final year n5103	Pharmacists n578	Total N5512
Gender ^a						
Men, No. (%)	23 (27)	16 (19)	4 (4.8)	5 (6.0)	36 (42.9)	84 (16)
Women, No. (%)	76 (17.8)	115 (26.9)	97 (22.7)	98 (22.9)	42 (9.8)	428 (84)
Age, No. (%) ^b						
<20 y	66 (66.7)	3 (2.3)	0 (0)	0 (0)	0 (0)	69 (13.5)
21-25 y	33 (33.3)	126 (96.2)	101 (100)	102 (99)	41 (52.6)	403 (78.7)
26-30 y	0	2 (1.5)	0	1 (1)	32 (41)	35 (6.8)
31-35 y	0	0	0	0	2 (0.4)	2 (0.4)
36-40 y	0	0	0	0	2 (0.4)	2 (0.4)
>41 y	0	0	0	0	1 (0.2)	1 (0.2)
Completed the ethics course ^c						
Yes, No. (%)	0	40 (30.5)	75 (74.3)	74 (71.8)	78 (100)	265 (51.8)
No, No. (%)	99 (100)	91 (69.5)	26 (25.7)	29 (28.2)	0	247 (48.2)

^a A significant difference in gender was found among the study cohorts ($p=.001$).

^b A significant difference in age was found among the study cohorts ($p=.001$).

^c There was no significant difference in scores among the different groups.

Descriptive statistics indicated that the analyzed sample included 99 third-year students (19.3%), 131 fourth-year students (25.6%), 101 fifth-year students (19.7%), 103 final-year students (20.1%), and 78 recent graduates working as pharmacists (15.2%). The majority of participants were female ($n=428$, 83.6%) and aged between 21 and 25 years ($n=403$, 78.7%). At the time of data collection, about half of the participants ($n=265$, 51.8%) had already taken the ethics course. Significant imbalances were observed in the distribution of gender and age across the five cohort groups ($\chi^2=231.13$, $p<.001$ and $\chi^2=1461.48$, $p<.001$, respectively). In contrast, no notable difference was found regarding completion of the ethics course among the groups ($\chi^2=0.945$, $p=.33$).

Table 2 presents the distribution of Principled Morality Scores. It details the minimum, maximum, and median values for each of the five cohorts. The overall median Principled Morality Score was 16.7. No statistically significant variation was detected across the cohorts ($p=.112$), suggesting that participants' level of principled moral reasoning remained stable throughout their academic progression and into early professional practice.

Table 2. Principled morality scores of study participants by cohort group, $N=512^a$

	Year three	Year four	Year five	Final year	Pharmacists	Total
Principled Morality Score	n599	n5131	n5101	n5103	n578	N5512
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

^a No statistical differences in scores were observed among the five cohorts.

A Mann-Whitney test was performed to assess potential gender differences in Principled Morality Scores, revealing no statistically significant variation (median 20 for females versus 16.7 for males, $p=.18$). Similarly, no meaningful differences emerged when comparing participants who had taken the ethics course with those

who had not (median 20 versus 16.7, respectively, $p=.63$).

The Kruskal-Wallis test evaluated variations in median Principled Morality Scores across the five cohort groups based on academic year. A significant overall difference was detected ($H=16.24$, $df=4$, $p=.003$). Pairwise post hoc comparisons identified that the only notable distinction was between final-year students and early-career pharmacists (median 20 versus 13.3, respectively, $p=.003$). In contrast, no significant differences were observed across the six age categories (<20, 21-25, 26-30, 31-35, 36-40, and >41 years; $H=4.439$, $df=5$, $p=.488$). The Jonckheere-Terpstra test for trend indicated no statistically significant upward pattern in median Principled Morality Scores as participants progressed from third-year students through to early-career pharmacists ($TJT=50640.50$, $z=-0.76$, $p=.45$).

Early-career pharmacists consistently obtained lower Principled Morality Scores compared to undergraduate students, implying a potential decline in ethical reasoning abilities after entering professional practice and suggesting that university-level instruction may not sufficiently transfer to real-world settings. These lower scores might also stem from the practical challenges in community pharmacy, where organizational demands, resource constraints, and performance pressures can hinder the application of higher-level principled thinking as described in Kohlberg's framework [35].

The results indicate that neither age nor gender significantly influenced Principled Morality Scores in this sample. This aligns with previous applications of the PEP test by Chaar and by Allinson and Black, which similarly reported no notable gender or age-related differences [20, 30]. Murphy and Rest's review further supports this, noting gender differences in only a minority of studies [33], while research on college-aged participants using the DIT has often found no age association [36, 37]. However, some DIT-based investigations in pharmacy have reported higher scores among women [13, 21, 38-40].

No evidence emerged of progressively higher median Principled Morality Scores with advancing academic years, possibly reflecting limited depth or effectiveness in professional ethics instruction. Longitudinal research has demonstrated that higher education typically shifts

reasoning from conventional to postconventional levels [41-47], with formal education emerging as the strongest predictor of gains in DIT scores rather than age alone [38, 48].

The notably low scores overall underscore a gap between current ethics education and professional needs, signaling the importance of curriculum reform to better foster ethical attitudes, prepare students for clinical dilemmas, and enhance reasoning capabilities [7, 8, 10, 49]. Suggested changes include embedding ethics and professionalism throughout the entire program [9, 41-48] and adopting strategies that connect theoretical concepts to practical application [49].

Limitations include the cross-sectional design, restriction to a single institution (limiting generalizability to other Jordanian pharmacy schools), and inclusion of only early-career alumni (not representative of all practicing pharmacists). Nonetheless, amid evolving patient-focused roles in pharmacy, these findings offer valuable insights into the literature on professional moral reasoning.

Conclusion

This investigation offers evidence-based insights into the ethical growth of aspiring pharmacists. The current results will serve as a foundation for a planned longitudinal follow-up using the PEP test with one cohort, aiming to establish causality between ethics education and improvements in moral judgment. Should future studies confirm these patterns, substantial revisions to pharmacy curricula would be advisable to optimize ethical development.

Acknowledgments: The authors acknowledge all research participants who took part in the study. All authors have completed the International Committee of Medical Journal Editors uniform disclosure form (www.icmje.org/coi_disclosure.pdf) and declare no support from any organization for the submitted work, no financial relationships with any organizations that might have an interest in the submitted work in the previous three years, and no other relationships or activities that could appear to have influenced the submitted work.

Conflict of Interest: None

Financial Support: None

Ethics Statement: None

References

1. Kohlberg L. Stage and Sequence: The Cognitive-developmental Approach to Socialization. *Handbook of socialization theory and research*. 1969;347:480.
2. Sheehan TJ, Husted SD r., Candee D, et al. Moral Judgment as a Predictor of Clinical Performance. *Eval Health Prof*. 1980;3(4):393. doi:10.1177/016327878000300404
3. Cohen S. The nature of moral reasoning: the framework and activities of ethical deliberation, argument, and decision-making. *Choice Rev Online*. 2005;42(11):42-6407-42-6407. doi:10.5860/choice.42-6407
4. Krichbaum K, Rowan M, Duckett L, et al. The clinical evaluation tool: a measure of the quality of clinical performance of baccalaureate nursing students. *J Nurs Educ*. 1994;33(9):395-404. doi:10.3928/0148-4834-19941101-05
5. Latif DA, Berger BA, Harris SG, et al. The relationship between community pharmacists' moral reasoning and components of clinical performance. *J Soc Adm Pharm*. 1998;15(3):210-224.
6. Latif DA, Berger BA. Moral reasoning in pharmacy students and community practitioners. *J Soc Adm Pharm*. 1997;14(3):166-179.
7. Bebeau MJ. The defining issues test and the four component model: Contributions to professional education. *J Moral Educ*. 2002; 31(3):271-295. doi:10.1080/0305724022000008115
8. Roche C, Thoma S. Insights from the defining issues test on moral reasoning competencies development in community pharmacists. *Am J Pharm Educ*. 2017;81(8):21-32. doi:10.5688/ajpe5913
9. Gallagher CT. Assessment of levels of moral reasoning in pharmacy students at different stages of the undergraduate curriculum. *Int J Pharm Pract*. 2011;19(5):374-380. doi:10.1111/j.2042-7174.2011.00121.x
10. Latif DA. The influence of pharmacy education on students' moral development at a school of pharmacy in the USA. *Int J Pharm Pract*. 2009;17(6):359-363. doi:10.1211/ijpp/17.06.0007
11. Harasym PH, Tsai TC, Munshi FM. Is problem-based learning an ideal format for developing ethical decision skills? *Kaohsiung J Med Sci*.

- 2013;29(10):523-529.
doi:10.1016/j.kjms.2013.05.005
12. Rest JR. Moral Development in the Professions: Psychology and Applied Ethics. Vol 32. Psychology Press; 1995. doi:10.5860/choice. 32-5012
13. Latif DA. An assessment of the ethical reasoning of United States pharmacy students: A national study. *Am J Pharm Educ.* 2004; 68(2):1-10.
14. Kitchener KS. The reflective judgment model: Characteristics, evidence, and measurement. In RA Mines & KS Kitchener. *Cognitive development in young adults.* 1986.
15. Holden BJ, Burnett AH, Vivekananda-Schmidt P. Case-based learning: Integrating medical ethics and law into clinical practice. *Educ Prim Care.* 2014;25(5):283-287.
16. Georgiou I, Zahn C, Meira BJ. A systemic framework for case-based classroom experiential learning. *Syst Res Behav Sci.* 2008; 25(6):807-819. doi:10.1002/sres.858
17. Self DJ, Olivarez M, Baldwin DWC. The amount of small-group case-study discussion needed to improve moral reasoning skills of medical students. *Acad Med.* 1998;73(5):521-523. doi:10.1097/00001888-199805000-00019
18. Rest JR, Narvaez D, Thoma SJ, et al. DIT2: Devising and Testing a Revised Instrument of Moral Judgment. *J Educ Psychol.* 1999; 91(4):644-659. doi:10.1037/0022-0663.91.4.644
19. Wingfield J, Bissell P, Anderson C. The scope of pharmacy ethics—an evaluation of the international research literature, 1990–2002. *Soc Sci Med.* 2004;58(12):2383-2396.
20. Chaar BB. Professional ethics in pharmacy practice: Developing a psychometric measure of moral reasoning. *Pharm World Sci.* 2009; 31(4):439-449. doi:10.1007/s11096-009-9292-1
21. Prescott J, Becket G, Wilson SE. Moral development of first-year pharmacy students in the United Kingdom. *Am J Pharm Educ.* 2014;78(2). doi:10.5688/ajpe78236
22. Hanna LA, Gillen J, Hall M. An investigation of final year pharmacy students' moral reasoning ability, and their views on professionalism and fitness to practice panel determinations: A questionnaire study. *Curr Pharm Teach Learn.* 2017;9(4):652-659. doi:10.1016/j.cptl.2017.03.016
23. Latif DA. An assessment of the level of moral development of American and Canadian pharmacy students. *Int J Pharm Pract.* 2002;10(3):153-160.
24. Cooper RJ, Bissell P, Wingfield J. Ethical decision-making, passivity and pharmacy. *J Med Ethics.* 2008;34(6):441-445.
25. Latif DA. The relationship between pharmacists' tenure in the community setting and moral reasoning. *J Bus Ethics.* 2001;31(2):131-141.
26. Bebeau MJ, Rest JR, Yamoore CM. Measuring the ethical sensitivity of dental students. *J Dent Educ.* 1985;49(4):225-235.
27. Hoffmann J, Sprague J. Exploring Alternate Perspectives in Fairness to Help TAs Develop Course Policies and Manage Student Challenges. In: Third National Conference on TA Training and Employment (Austin, TX). 1991.
28. Crisham P. Measuring moral judgment in nursing dilemmas. *Nurs Res.* 1981;30(2):104-110.
29. Bebeau MJ, Thoma SJ. "Intermediate" concepts and the connection to moral education. *Educ Psychol Rev.* 1999;11(4):343-360.
30. Allinson M, Black P. Developing moral reasoning skills for pharmacy practice. *Int J Pharm Pract.* 2016;24:4-5.
31. Chaar B, Brien J, Krass I. Professional ethics in pharmacy: the Australian experience. *Int J Pharm Pract.* 2005;13(3):195-204. doi: 10.1211/ijpp.13.3.0005
32. Rest JR, Narvaez D, Thoma SJ, et al. *Postconventional Moral Thinking.* Psychology Press; 1999. doi:10.4324/9781410603913
33. Murphy HJ, Rest JR. Development in Judging Moral Issues. *Can J Educ / Rev Can l'éducation.* 1980;5(3):109. doi:10.2307/1494347
34. Nordstokke DW, Zumbo BD. A new nonparametric levene test for equal variances. *Psicologica.* 2010;31(2):401-403.
35. Jacobs S, Johnson S, Hassell K. Managing workplace stress in community pharmacy organisations: lessons from a review of the wider stress management and prevention literature. *Int J Pharm Pract.* 2018;26(1):28-38. doi:10.1111/ijpp.12360
36. Armstrong MB. Ethics and professionalism in accounting education: A sample course. *J Account Educ.* 1993;11(1):77-92.
37. Cummings R, Dyas L, Maddux CD, et al. Principled moral reasoning and behavior of preservice teacher

- education students. *Am Educ Res J.* 2001;38(1):143-158.
38. Murphy HJ, Rest JR. Development in Judging Moral Issues. *Can J Educ/ Rev Can l'education.* 1980;5(3):109. doi:10.2307/1494347
 39. Maeda Y, Thoma SJ, Bebeau MJ. Understanding the relationship between moral judgment development and individual characteristics: The role of educational contexts. *J Educ Psychol.* 2009;101(1):233.
 40. Walker LJ. Sex differences in the development of moral reasoning: A critical review. *Child Dev.* 1984;1:677-691.
 41. Foster JD, LaForce B. A longitudinal study of moral, religious, and identity development in a Christian liberal arts environment..*J Psychol Theol.* 1999;27(1):52-68.
 42. King PM, Mayhew MJ. Moral judgement development in higher education: Insights from the Defining Issues Test. *J Moral Educ.* 2002;31(3):247-270.
 43. King PM, Kitchener KS, Wood PK. The development of intellectual and character: A longitudinal-sequential study of intellectual and moral development in young adults. In: *Moral Education Forum.* Vol 10.; 1985:1-13.
 44. Shaver DG. A longitudinal study of moral development at a conservative, religious, liberal arts college. *J Coll Student Pers.* 1985.
 45. Shaver DG. Moral development of students attending a Christian, liberal arts college and a Bible college. *J Coll Student Pers.* 1987.
 46. Smith CA, Bunting CJ. The moral reasoning of two groups of college students. *Res Educ.* 1999;(62):72.
 47. Snodgrass J, Behling R. Differences in moral reasoning between college and university business majors and non-business majors. *Bus Prof Ethics J.* 1996:79-84.
 48. Rest JR, Thoma SJ. Relation of moral judgment development to formal education. *Dev Psychol.* 1985;21(4):709.
 49. Gallagher CT. Building on Bloom: A paradigm for teaching pharmacy law and ethics from the UK. *Curr Pharm Teach Learn.* 2011;3(1):71-76. doi:10.1016/j.cptl.2010.10.002