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Measuring moral development in the pharmacy profession from undergraduate to established practitioner: a decadal longitudinal study

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Abstract

The aim of this study is to measure and evaluate the moral reasoning of undergraduate pharmacy students as they progress through a British university, and onward through the early years of their professional practice. This study utilizes version 2 of Rest's Defining Issues Test in a longitudinal design, evaluating a single cohort of future pharmacists, which started a 4-year Master of Pharmacy degree program in 2008–09, completed their preregistration training, and progressed through their early careers. The final dataset was collected in 2019. Both descriptive and inferential statistical analysis was subsequently carried out. The cohort experienced significant moral growth during the 4 years of their undergraduate degree, where they were exposed to an ethical education designed to engage students at the "plus one" level of moral reasoning. There is also evidence for work-based augmentation of moral development between graduation from university and qualification as pharmacists. The subjects underwent a marked increase in moral development as they progressed through their undergraduate studies, followed by another sizeable, though not statistically significant developmental progression during the preregistration year. The retrograde step in moral development observed between newly qualified level and established practitioner level requires further investigation: structured interviews with participants, which focus on changes to their experiences in practice and how these affected their moral agency are already underway.

Keywords: professional training; professional ethics; other (moral development)

Introduction

The role of the pharmacist is evolving into one with increased responsibility and more patient-facing roles across all settings, including in general practice and urgent care. Recent changes to the General Pharmaceutical Council's (GPhC) *Initial Education and Training for Pharmacists* indicate that pharmacists will soon be expected to play a more active role in the provision of clinical care, including prescribing medicines, from their first day as registered pharmacists [1]. Such changes increase the importance of pharmacy students being prepared for the responsibility of making clinical and moral decisions relating to patient care during both their undergraduate degree and their preregistration training year.

If pharmacists are expected to make sound ethical decisions in the best interest of their patients, they must first be provided with enhanced moral reasoning abilities. Moral development refers to the enhancement of moral reasoning abilities in an individual. Moral reasoning is the cognitive process in which a person engages when making a decision. It requires that the individual establish that there is a dilemma, and weigh the moral principles involved to come to a scrupulous decision [2]. Examples of the types of moral dilemmas that may be faced in practice, which were investigated in parallel with the research described in this study are available in the literature [3].

Healthcare professionals are better able to make robust moral decisions once they have achieved advanced levels of moral decision-making [4, 5]. In spite of this observation, it has been noted that there are no formally recognized mechanisms to actively measure or enhance moral reasoning in practicing pharmacists [5]. A necessary starting point in achieving this is to attain a deeper understanding of the pattern moral development takes, both through formal pharmacy education and into professional practice.

Previous research using cross-sectional studies of pharmacy students in the UK and worldwide has shown that moral development can be both taught and measured [6]. Furthermore, it has been shown that pharmacists' moral reasoning and aptitude in dealing dilemmas are greatly influenced by educational experiences at university, as well as personal values and societal norms [7]. Most recently, the positive impact of teaching ethics during formal pharmacy education in terms of an increase in moral development in the later years of undergraduate training has been reported [8]. This research also recognized the potential benefits of a longitudinal mixed-methods approach, which would improve the generalizability of findings of research relating to moral development of pharmacists. Not all research has shown that progression through formal education gives rise to improved moral

reasoning [2, 9]. An early meta-analysis of moral education interventions found that an increase in moral reasoning was subject to various factors such as length and style of intervention and, as such, not all studies and interventions yielded a significant increase in reasoning [10].

The aim of this study is to measure and evaluate the moral reasoning of undergraduate pharmacy students as they progress through a British university, and onward through their first 5 years of professional practice.

Method

Study design

This study utilized a longitudinal design, using version 2 of Rest's *Defining Issues Test* (DIT-2) [11, 12]. The DIT-2 contains moral dilemmas and standard items; the subject's task is to rate and rank the items in terms of their moral importance. The DIT-2 was completed by participants from a single cohort of students—which started the 4-year Master of Pharmacy (MPharm) degree program at the University of Hertfordshire in 2008–09—once during each year of undergraduate study, once more following their first year of qualification as pharmacists, and again as established practitioners after 5 years in practice.

Sample and recruitment

145 MPharm students studying at the University of Hertfordshire were invited to complete the DIT-2 online in October 2008 during their first year of study, and again in 2009, 2010, and 2011 during their second, third, and final years, respectively. To track the participants as they progressed through their degree and following graduation, each was assigned a unique anonymous identification number, which was retained for the duration of the study. The fourth distribution of the DIT-2 (during the final year of study) included an opt-in for further participation for which the participants were required to provide an e-mail address through which they could be contacted. The penultimate and final distributions of the test were distributed using these contact details. This occurred in October 2014, 1 year after they had completed their preregistration year, passed the registration assessment, and qualified as pharmacists; and again in October 2019, after they had been qualified practitioners for 5 years. In each case, following an initial request to complete the DIT-2, a reminder e-mail was sent to nonresponders after 2 weeks.

Ethical approval

Ethical approval for this project was sought from the School of Pharmacy Research Ethics Committee before the data being collected: approval number PHAEC/12-71.

DIT-2

The DIT-2 is a device for activating moral schemas and for assessing them in terms of importance judgments. Schemas can be defined as sets of expectations, hypotheses, and concepts that are formed as the individual notices similarities and recurrences in experience [13]. Moral schemas are built from experience in social interaction. They are constructed automatically from the brain noticing elements in the socially relevant environment, and the cause–consequence chains that derive from particular actions. Schemas are experientially affected: the schemas of an expert are more easily activated by features of a problem than those of a novice.

The DIT-2 presents five short moral dilemmas followed by a series of 12 statements of justification, each representing a moral argument or schema. Participants rate the importance, rank the top four decision factors, and provide an action choice for the dilemma's protagonist. When an individual reads a moral dilemma, moral schemas are activated. The DIT-2 presents the measures of moral development in three clusters that closely fit Kohlberg's six stages of development (Table 1). These have been named the personal interest (PI), the maintaining norms (MN), and the postconventional (PC) schemas, respectively. The N2-index, which uses a continuous scale ranging from 0 to 95, measures the participant's overall moral judgment development [14]. While Kohlberg represents development in terms of movement between stages, the DIT-2 assigns an N2 score to a participant. Development is a matter of shifting distributions of stages rather than the move from one stage completely into the next. Movement is gradual and assessment needs to consider quantitative dimensions of stage use. Each of Kohlberg's stages represents a qualitatively different way of moral thinking, and each make qualitative distinctions in designating stage differences to different items. The N2 score is calculated based on whether items corresponding to the postconventional schema are selected with higher priority than those corresponding to the PIs or MN schemas [11].

Analysis

Completed DIT-2 tests were initially processed at the Center of the Study of Ethical Development at the University of Alabama, as per the EULA.

Descriptive and inferential statistical analysis was carried out in IBM SPSS Statistics for Windows, version 25. The Shapiro–Wilk test was applied throughout this study test as the numerical means of assessing normality [15], and Levene's test was used to assess homogeneity of variances [16]. Medians and standard deviations were calculated and compared using pairwise comparison with the Wilcoxon signed-rank test [17], to which the Bonferroni correction was applied [18], as this methodology is very common, especially in studies evaluating the time course of an effect [19].

Attrition with loss to follow-up over time is one of the main difficulties of longitudinal research [20], resulting in fewer participants providing information [21]. The issue of missing data is more pronounced when participants are requested to complete the same test on multiple occasions [22]. However, longitudinal research can enable the sequencing of events and follow a change—in this case in the moral development

Table 1. Summary of the DIT-2 schemas in relation to Kohlbergian developmental stages

Kohlberg's development stages	DIT-2 schemas
Stage 2	*Personal Interest (PI)*
Stage 3	
Stage 4	*Maintaining Norms* (MN)
Stage 5	*Postconventional (PC)*
Stage 6	

of a single cohort—over time. This methodology has the additional benefit of not throwing away all data relating to a participant in instances where that participant has missed, e.g., a single repetition in the series of six measurements [23, 24], as would be the case if the Friedman test were employed [25], Instead, only pairs including a missing data point are discarded.

Results

Overview

The data collection period in this research spanned over 10 years. The first dataset was collected in 2008, when the cohort was in their first year of the MPharm program. There were 146 students registered on the program in 2008–09, of which 125 (86%) completed the questionnaire. The response rate progressively decreased for each subsequent distribution as the students progressed through their degree (Table 2). Nevertheless, the response rate remained high while the students remained in formal education. However, after graduation the response rate did decrease markedly. Of the 130 participants who agree to be contacted following their graduation, the response rate was 33% after 1 year and 9% after 5 years. This equates to 30% and 8%, respectively, of the original cohort (Table 2).

N2 score

Analysis revealed a statistically significant difference in N2 scores between Level 1 (Mdn = 22.1) and Level 3 (Mdn = 26.8) (P = 0.025) as shown in Figure 1. There were increases in N2 score of 2.31 between Level 1 and Level 2, and 2.42 between

Table 2. Summary of respondents completing the DIT-2 over the ten-year data collection period

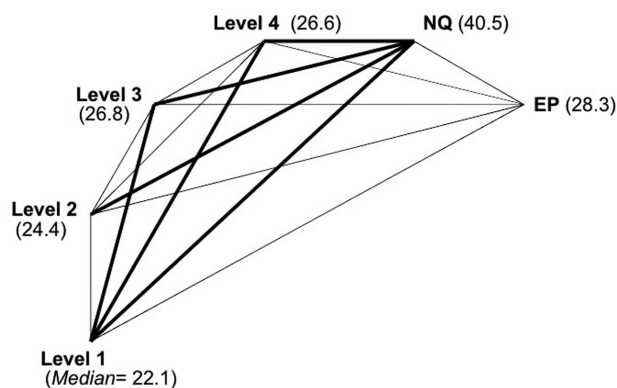| Stage	n	Percentage*
Level 1	125	86
Level 2	110	75
Level 3	94	64
Level 4	93	64
NQ	43	30
EP	11	8

Figure 1. Relative positions of median N2 scores at each level from first-year undergraduate to experienced practitioner. Bold lines represent statistically significant difference between levels

Level 2 and Level 3, and a drop of 0.18 between Level 3 and Level 4, but these were not statistically significant. These preliminary results support the findings that moral education can have a positive influence on maturation of moral reasoning. The significance in the increase in N2 score between Level 1 and Level 4 (P = 0.011) is a positive indication that students' moral development is significantly enhanced by the time they complete the MPharm program. There is also a statistically significant difference between Level 4 (Mdn = 26.6) and NQ Level (Mdn = 40.5), supporting findings that work-based learning has a positive impact on moral development. While there is a substantial decrease in N2 score between NQ and EP levels, this difference is not statistically significant. There is also evidence for work-based augmentation of moral development with a statistically significant increases between Levels 4 and NQ (P < 0.0005).

MN and PI

MN scores were not statistically different between the various levels of the study (Figure 1). Median values were identical for Levels 1, 2, and 4 (Mdn = 34.0). There was a slight, but insignificant increase at Level 3 (Mdn = 36.0). There was a slight increase between Level 4 and NQ but, again, this was not statistically significant. MN fell to its lowest point at EP level (Figure 2).

Conversely, there was significant variation in PI scores across the data collection period. The downward trend, shown in Figure 2, between Levels 1 (Mdn = 32.0), 2 (Mdn = 30.0), and 3 (Mdn = 28.0) was reflected by a significant difference between Levels 1 and 3 (P = 0.019). The slight increase between Levels 3 and 4 (Mdn = 30.0) was not statistically significant. There were also significant reductions in PI between Levels 1, 3, 4, and NQ Level (P < 0.0005). This supports the findings that as the participants move away from Stage 1 to 2 moral reasoning as they mature and progress through education [26].

Discussion

The cohort experienced significant moral growth during the 4 years of their undergraduate degree, where they were exposed to an ethical education designed to engage students at the "plus one" level of moral reasoning. There is also evidence for work-based augmentation of moral development between graduation from university and qualification as pharmacists.

The research offers a quantitative perspective of the moral development that teaching ethics to pharmacy students has. Due to the longitudinal nature of this study, with participants being followed over a prolonged time period, the response rate was negatively affected toward the latter years of the research, therefore the small sample size limits this study's generalizability. A mixed-method qualitative approach would also substantiate findings and provide further understanding of the rationale behind moral development and decision-making. Semi-structured interviews will be carried out with participants who indicated that they would be interested in participating in the interviews for the research as further study.

N2 score

The N2 scores indicate that the cohort experienced significant moral growth during the 4 years of their undergraduate MPharm degree. Throughout this program of study, these students were exposed to an ethical education designed to

engage students at the "plus one" level of moral reasoning described above. Additional layers of complexity were added as the students progressed through the program. While it cannot be concluded that progression through the pharmacy curriculum caused the increase in moral reasoning ability, it is interesting to note that the greatest increase in N2-score occurred between Level 2 and Level 3, during which most of the teaching in normative ethics was delivered.

MN

MN is an intermediary score, and it was not expected that there would be a significant difference between the levels. Indeed, MN scores remained effectively unchanged throughout the study. In explaining this, it is useful to understand the way that moral development is represented through the indices. For simplicity, we can first consider morality as a binary discriminator, which considers people to be either selfish or selfless. In a binary system, there is a single degree of freedom: participants may only move from one group to the other. If we test 100 participants and 50 are selfish and the remaining 50 selfless, the split is clear within the group at baseline. If the same test is applied a year later and 90 participants are selfless then there must be 10 selfish people remaining, and the group has shown a net development. Conversely, if 10 are selfless then 90 must be selfish, then there is a net reversion among the group.

If we then introduce an intermediate state, creating a three-state system—selfish, intermediate, and selfless (or PI, MN, and N2)—there are now two degrees of freedom. Participants may now move between selfish and intermediate, and between intermediate and selfless, or they may jump two steps between selfish and selfless. If baseline testing identifies 30 selfish, 40 intermediate, and 30 selfless participants, and follow-up testing detects 10 selfish, 40 intermediate, and 50 selfless subjects, this could be due to 20 moving from selfish to intermediate and 20 moving from intermediate to selfless, or 20 moving directly from selfish to selfless (i.e. bypassing the intermediate state) while 20 remain at the intermediate level, or some combination of these two processes.

In each of these scenarios, there has been the same net development in the group without any observed change in the intermediary score. In a three-state system, a significant change may be observed in the categories in the extremities with little change in the intermediate group.

PI

PI score, in contrast to N2, fell as the study progressed, bottoming out at NQ before the cohort demonstrated a marked reversion following 4 years of independent practice. This supports the findings that as the participants move away from Stage 1 to 2 moral reasoning as they mature and progress through education [26].

Global

The MN score is maintained at a similar level across the study period. As the PI score reduces, there is a corresponding increase in N2 score (Figure 2). This could involve either or both of the mechanisms described above. In any case, there is a net moral development of the cohort between Level 1 and NQ. However, after NQ there is a marked—but not significant—regression in the cohort's moral reasoning,
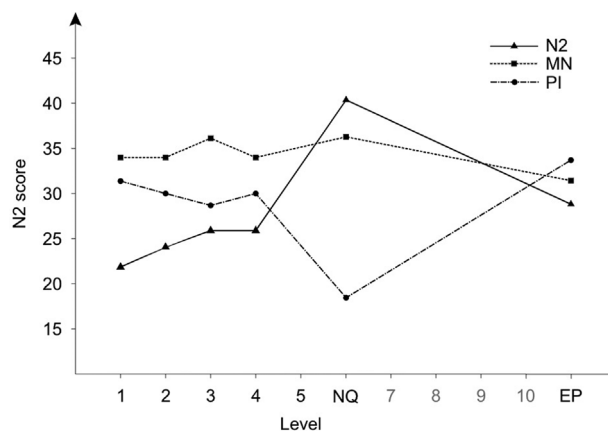

Figure 2. Trends in moral indices across the eleven years of data collection

demonstrated by an increased affinity for the PI schema at the expense of both MN and N2.

The magnitude of the increase in N2 scores and the decrease in PI scores, respectively, between Level 4 and NQ, suggests that participants ascended two levels to postconventional reasoning between obtaining their degrees and becoming fully independent practitioners. During the 5 years between the NQ and EP measurements, the opposite seems to be apparent, with many participants reverting back to PIs. The trend in the data makes apparent the effect of formal education on moral development as seen in literature, as well as the positively robust influence of work-based learning on moral development [27]: however, after 5 years, this positive effect is not sustained.

In summary, these results show that there is a general increase in moral development as the participants progress through the MPharm program followed by a more marked one at the newly qualified level. The retrograde step in moral development between NQ and EP levels needs further investigation through qualitative methods to substantiate these findings and attempt to make recommendations.

We hypothesize that, having developed the tools to become effective moral agents during their undergraduate studies, the newly qualified pharmacists were initially quick to identify problems and dilemmas to which they could be applied and did so freely in line with their own moral beliefs. Previous work has shown that more experienced pharmacists often suffer from moral distress as they are forced to act in a manner that is incongruent with their own moral compass, typically due to administrative or institutional constraints [28]. This has been shown to lead to defensive moral practices, in which they seek first to protect themselves—rather than their patients—from the consequences of their actions [8]. The next step in this research will be to probe experienced practitioners to determine the reasons for their measurable moral regression since becoming independent practitioners.

Conclusion

The findings of this study highlighted the general increase in moral development as students' progress through the MPharm program. This study also highlights the remarkable increase in moral development during the preregistration

year. The retrograde step in moral development that occurred between newly qualified level and established practitioner level requires further investigation, and this will be facilitated by interviews with participants, focusing on changes to their experiences in practice during that period and how these affected their moral agency.

Conflict of interest statement: None declared.

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Data availability

The data underlying this article cannot be shared publicly due to its inclusion in an ongoing PhD project. The data will be shared on reasonable request to the corresponding author following the examination of this PhD.

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