

# Professionalism development of undergraduate medical students

## Effect of time and transition

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### Abstract

Changeover phases are essential and inevitable times in professional life, which let the learners adapt and grasp emerging opportunities for learning based on the past experiences with the catering of novel creativity as required in the present as well as emerging time. This study was carried out to examine the effectiveness of a professionalism course, during the transition from a non-clinical to clinical setting, within the context of undergraduate medical education.

This observational study was conducted during 2019 to 2020, with pre- and post-professionalism course evaluation. We used the Dundee Poly-professionalism inventory-1: Academic Integrity, among the undergraduate medical students.

Our results are based on the medical student's professional progress with the transition from 2nd year to 3rd year. During the 1st phase of the study, the participants at their Pre-Professionalism Course (PrPC) level in their 2nd medical year (only attended the introductory lectures for professionalism), showed a good understanding of professionalism. For the 2nd phase, when the same students, at their Post-Professionalism Course (PoPC) level, in their 3rd year (completed professionalism course) filled the same survey and it was found that there was no decline in their understanding of the topic, even after more than a year. They were even more aware of the significance of professionalism in their clinical settings.

Despite a year gap, the understanding of professionalism among students was stable. Results helped us infer that time laps did not affect the professionalism concept learned earlier; rather during clinical settings, students become more aware of professionalism.

**Abbreviations:** ABIM = American Board of Internal Medicine, ABMS = American Board of Medical Specialties, IBM = International Business Machines Corporation, IRB = Institutional Review Board, PoPC = Post-Professionalism Course, PrPC = Pre-Professionalism Course, SPSS = Statistical Package for the Social Sciences.

**Keywords:** clinical, medical students, non-clinical, professionalism, professionalism, transition, undergraduate

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## 1. Introduction

Professionalism is characterized as a gathering of mentalities, qualities, practices, and communications that go about as the premise of the wellbeing expert's agreement with society. Medical professionalism skill is a central competency for medical students as learners and practising doctors as life-long learners. This group of professionals are exposed to high work demands; henceforth, cultivating the best practices has become a significant segment of medical education.<sup>[1–4]</sup> According to the American Board of Medical Specialties (ABMS), “Professionalism is a belief system in which group members (‘professionals’) declare (‘profess’) to each other and to the public, the shared competency standards and ethical values they uphold in their work and what patients can expect from these professionals.”<sup>[5]</sup> Despite its increasing value as a vital competence element, among healthcare stakeholders, there remains a significant distinction of sentiment about professionalism methodology in the healthcare setting.

Conceptual variations for professionalism teachings do exist between professionalism, humanism, and individual and expert development, making it challenging to be accepted across different cultures and distant geographical healthcare settings. Additionally, varied preferences, aversions, and contrasts in professionalism assessments are likewise found in characterizing professionalism as indicated by dominating social or cultural differences.<sup>[6,7]</sup> No unanimously established theoretical settings of professionalism are presently offered. The American Board of Internal Medicine (ABIM) recognizes 6 broad elements of

professionalism (altruism, accountability, excellence, duty, honour and integrity, and respect for others).<sup>[8]</sup>

Due to difficulties in characterizing professionalism, medical education programs have no other alternative than to show it expressly. Different educational program plans have been recommended to cultivate the individual and professional improvement of medical students.<sup>[9]</sup> Such efforts have focused on both keeping medical students from unprofessional practices just as right lapses in professionalism. Yet, unfortunately, the unprofessional behaviors among medical students go from mild to serious.<sup>[10]</sup> The responsibility lapses are associated with other healthcare specialists but alarmingly toward the patients as well. Therefore, when gaps in the professionalism (which is an ever evolving educational domain), arise, students shall not be penalized, rather remediation is the choice.<sup>[11]</sup>

Although creating professionalism and remediating lapses among pre-clinical, undergraduate medical students are challenging because of the extent of understanding. Instructing and learning professionals in the pre-clinical phase of undergraduate medical education should place the essential morals, qualities, and convictions, just as their effects on personal and professional advancement, within medical students' everyday experiences, which are not constantly identified with clinical practice.<sup>[12]</sup> The rationale for this study is built around the common understanding that with the gap in any educational activity where the learners are not in touch with a particular knowledge or skill set, there lies chances for having a decline in their cognition base and also the

psychomotor responses may compromise, because of lack of practices. The study aimed to examine the effectiveness of the professionalism course, as a professional progress instrument, with 1 year apart, during the transition from non-clinical to a clinical setting, within the context of undergraduate medical education.

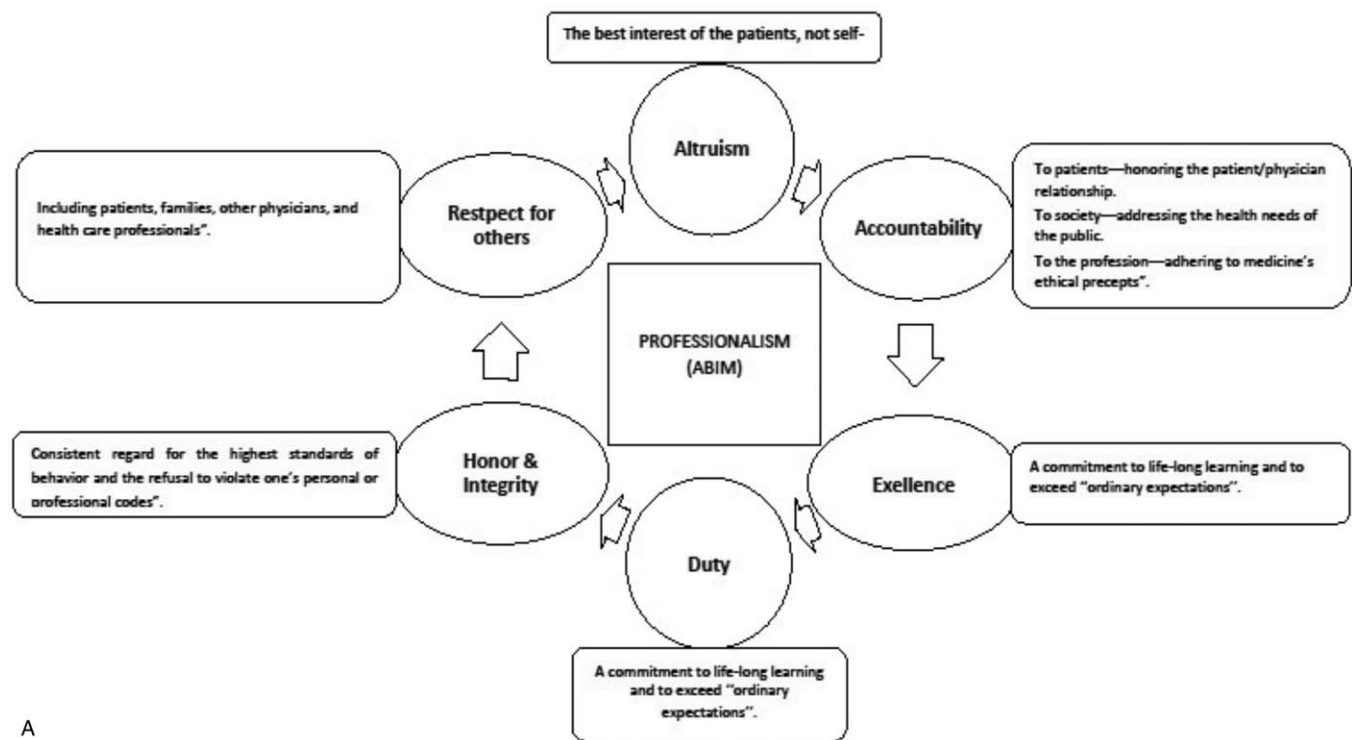
### 1.1. Overview of the professionalism course

We have an integrated and hybrid curriculum. This allows the learners to get reinforced with the key topics as they study and revise them in different contexts at different stages. There remains the provision of various knowledge facets to be explored repeatedly. Still, with increasing detail and complexity with progressing levels and because of embracing the spiral approach, it is intended and expected that the knowledge core and professional skills shall be developing with the progress of the curriculum. The objective of the medical program is to shift educational emphasis from the learning of the facts to teaching students the professional skills that they will need to be an effective lifelong learner.

This course aimed to indoctrinate the best professional attitudes and the teaching methodology comprised of interactive lectures on topics related to the essential elements of professionalism (ABIM 1994). These qualities of behavior are demarcated by the ABIM and universally quoted in the literature (Fig. 1).

While in our endeavor to inculcate professionalism attributes, align with what is stated by ABIM and our pre-defined objectives

**Main Components of Professionalism Course Based on Essential Elements of Professionalism (ABIM 1994)**



A

**Figure 1.** (A) Six essential elements of professionalism as advocated by ABIM, with relevance to the professionalism course components taught to undergraduate medical students. (B) A brief illustrative representation about teaching and assessment of professionalism course. (C) Graphic demonstration about course objectives leading to learners' professional development through teachers-learners participation. ABIM=American Board of Internal Medicine.

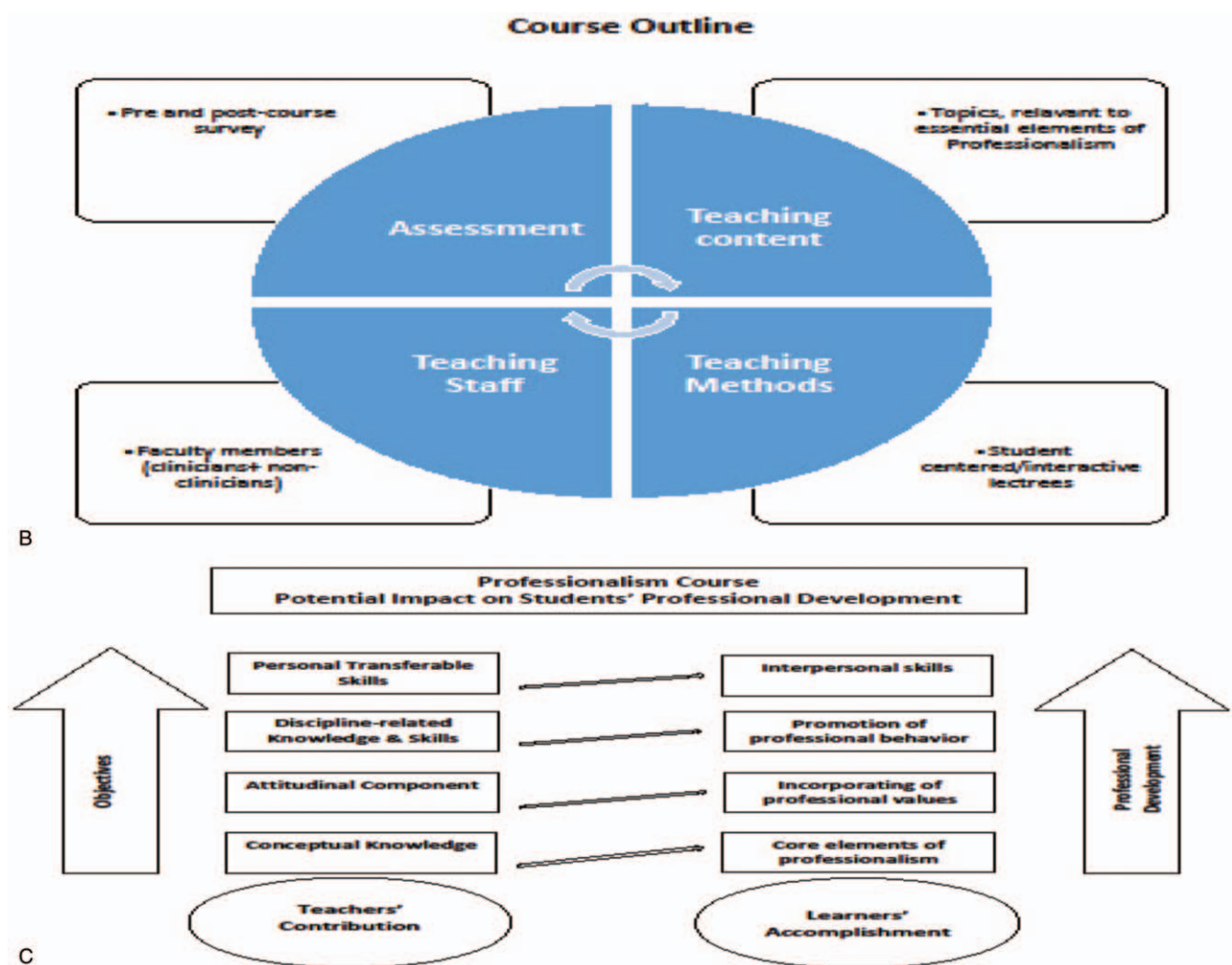


Figure 1. Continued

within our course outline comprised of teaching through interactive lectures on the topics associated with essential elements of professionalism, and for that we had utilized experienced teaching faculty both from pre-clinical and clinical subjects, who all volunteered for this course. The endeavor was anticipated to build up learner professional identity.

Assessment of the course, at 2 different phases, was carried out by using Polyprofessionalism Inventory.

With the importance of the subject, that is, professionalism and its attributes, this study aims at assessing the effectiveness of professionalism course, during the transition from non-clinical to the clinical setting, within the context of undergraduate medical education. Moreover, authors hypothesize that with the passage of time learning of essential elements might have gone on a decline.

## 2. Methods

### 2.1. Study design and setting

This observational study was carried out at a public sector university, in Riyadh, Saudi Arabia during the period January 2019 to November 2019. Collection of participants' responses as

recommended sanctions for the professionalism lapses, was done using The Dundee Poly-professionalism inventory-1: Academic Integrity "Supplemental Digital Content (Appendix 1, <http://links.lww.com/MD/F820>)" which previously has been successfully used in the UK, Pakistan, and Egypt.

### 2.2. Demography of participants and study size

This study had 2 phases, and the subject population in both phases was the same medical students (phase 1 = while in their 2nd year 2 at pre-course level, and phase 2 = while in their 3rd year at post-course level) enrolled in the medical program. We target the current course design with potential impact on student's professional development with the main components of professionalism course based on essential elements of professionalism.

Phase 1 of the study took place between January 2019 and May 2019, and the participants were in their starting week of 2nd year. An introductory interactive lecture of 2-hour duration, with the title "introduction of professionalism course" was arranged. The objectives of this lecture were to let students orient with definitions and brief explanations of the essential elements of professionalism. Proper arrangements were carried out for

advertising this lecture through students' email systems as well through the college notice board. At the same time, the aims of the study were also announced, so that students shall have a clear idea of what is expected of them.

The course was implemented in an undergraduate medical program; therefore, all medical students were eligible to participate in the study. Ethical approval was obtained by the Institutional Review Board (IRB-E-20-4592). However, using the University of Helsinki ethical guidelines, they had the option to withdraw from the study.

A convenience sampling technique was adopted to collect the data. A total of 227 students were in the 2nd year of college of medicine. Out of 227 students, 157 (69.16%) students attended this lecture. After the lecture, another announcement as a reminder was made to inform the students about the study, its objectives, and potential outcomes. Later, 146 students agreed to join in this study voluntarily, and the survey questionnaire was distributed to them. A total of 139 properly filled responses were collected back. Whereas, 7 forms were found to be incomplete so were not included. Out of a total of 139 participants, 90 (46.7%) were male and 49 (35.3%) female.

During phase 2, which was carried out in November 2019, the same questionnaire was distributed to the agreed participants (among the ones who attended phase 1). The student cohort remained the same as was in phase 1. Still, the main difference is that now these participants have already been through a full course of professionalism (while in phase 1 they had only attended the introductory lecture about the course with definitions and brief explanations of essential professionalism elements) and are in their 3rd year, which is a clinical year (during phase 1 they were in 2nd year which is a pre-clinical year).

### 2.3. Study instrument

We used a self-administered, anonymous, survey questionnaire, that is, the Dundee Poly-professionalism inventory-1: Academic Integrity "Supplemental Digital Content (Appendix 1, <http://links.lww.com/MD/F820>). This also incorporated the written consent of the participants. The survey was manually distributed to the agreed participants and collected back. Respondents commended the endorsements, based on a report,<sup>[13]</sup> in the form of 1 to 10 sanctions (Table 1) addressing 34 types of professionalism lapses in the undergraduate medical education context. These 34 statements served as the variables. Participants' responses were recorded on 5 points Likert scale, that is, strongly disagree, disagree, neutral, agree, and strongly agree.

**Table 1**  
List of 10 sanctions for students to recommend while responding against the 34 items of survey.

1.	Ignore (none)
2.	Reprimand (verbal warning)
3.	Reprimand (written warning)
4.	Reprimand, plus mandatory counselling
5.	Reprimand, counselling, extra work assignment
6.	Failure of specific class/remedial work to gain credit
7.	Failure of specific year (repetition allowed)
8.	Expulsion from college (readmission after 1 yr possible)
9.	Expulsion from college (no chance for readmission)
10.	Report to a regulatory body

We entered the collected data into Microsoft Excel 2010 and carried out an extensive analysis using International Business Machines Corporation (IBM) Statistical Package for the Social Sciences (SPSS) Program. A *P*-value of <.05 was deliberated statistically significant.

## 3. Results

Our results are mainly based on the medical student's professional progress with the transition from 2nd year to 3rd year. The participants during their Pre-Professionalism Course (PrPC) level, in their 2nd medical year, who attended only the introductory lecture about the professionalism course were requested to recommend their sanctions for 34 lapses as items of the survey (right after the introductory lecture). The results showed that these students have a good understanding of professionalism. These same students, again (now in 3rd medical year) during Post-Professionalism Course (PoPC) level have recorded their responses for the same survey items, so that a comparison of recommended sanctions for 34 professionalism lapses be carried out for any changeover, with time especially when the participants have attended the full course (professionalism) and they transit from pre-clinical to the clinical setting. These results help to identify changeover progress in terms of the congruence and the differences among the same students in the beginning and after completion of the professionalism course.

### 3.1. Congruence

We explored the recommended sanctions of the same students, but at 2 different occasions. Firstly when these students were at their pre-course stage (in their 2nd year) and had attended only the introduction part of the professionalism course, and again at post-course stage (in their 3rd year) while they had completed their professionalism course. We also compared the recommended sanctions, as median, in terms of gender, for attending participants.

**3.1.1. Congruence between pre- (2nd year) and post-course group (3rd year).** There was a congruence as (reported as the median) for the recommended sanction by the same students at 2 different stages of our study (i.e., pre-course and post-course) from a Saudi medical school for the unprofessional behaviors (Table 2), for example, *For the item, "Giving help for course work against a teacher's rule,"* both phase 1 and phase 2 groups (i.e., pre- and post-course level consequently) recommended the sanction 4; *"Removing an assigned reference from a shelf in the library to prevent other students,"* both groups recommended a higher sanction, that is, 6; *"Forging a healthcare worker's signature on a piece of work, patient chart, grade sheet or attendance form,"* both groups students marked a higher sanction, that is, 8; *"Claiming collaborative work as one's individual effort,"* both phase 1 and phase 2 students recommended sanction 6; *"Threatening or verbally abusing a university employee or fellow student,"* both groups' recommendations were a very high sanction, that is, 8. *"Attempting to use personal relationships, bribes or threats to gain academic advantages by, for example, getting advance copies of exam papers or passing exam by such pressures on staff,"* both groups recommended similar sanction 8. *"Engaging in substance misuse (e.g., drugs),"* both groups marked sanction 8. *"Physically assaulting a university employee or student,"* both groups'

**Table 2**  
**Congruence in recommended sanctions (median) between \*PrPC level and †PoPC level students.**

S. No	Items	(PrPC responses)			(PoPC Responses)		
		Phase 1, i.e., pre-clinical year			Phase 2, i.e., clinical year		
		2nd year students (n = 139)	Male (n = 90) (64.7%)	Female (n = 49) (35.3%)	3rd year students (n = 93)	Male (n = 48) (51.6)	Female (n = 45) (48.4)
1	Getting or giving help for course work against a teacher's rule (e.g., lending work to another student to look at)	4	4	4	4	4	5
2	Removing an assigned reference from a shelf in the library in order to prevent other students from gaining access to the information in it	6	5.5	6	6	6	6
3	Forging a healthcare worker's signature on a piece of work, patient chart, grade sheet, or attendance form.	8	8	8	8	8	8
4	Claiming collaborative work as one's individual effort	6	5	6	6	6	6
5	Threatening or verbally abusing a university employee or fellow student	8	8	8	8	8	9
6	Attempting to use personal relationships, bribes or threats to gain academic advantages by, e.g., getting advance copies of exam papers or passing exam by such pressures on staff	8	7.5	8	8	8	8
7	Engaging in substance misuse (e.g., drugs)	8	7	9	8	7.5	9
8	Physically assaulting a university employee or student	9	8	9	9	9	9
9	Purchasing work from a fellow student or internet etc supplier	6	6	6	6	6	6
10	Sabotaging another student's work	6	5.5	6	6	6	6
11	Sexually harassing (مضايقة) a university employee or fellow students	10	10	10	10	10	10
12	Resubmitting work previously submitted for a separate assignment or earlier degree	4	4	4	4	4	4
13	Plagiarizing (السرقة الأدبية) work from a fellow student or publications/internet	5	4.5	5	5	5	5
14	Involvement in pedophilic activities – possession/viewing of child pornography images or molesting children	10	10	10	10	10	10

\* Pre-Professionalism Course.

† Post-Professionalism Course.

response was a very strong sanction (i.e., 9) as they believed such activity should result in the expulsion from the college. "Purchasing work from a fellow student or internet etc. Supplier" both groups reported a similar high sanction (i.e., 6) again. "Sabotaging another student's work," they reported sanction 6. "Resubmitting work previously submitted for a separate assignment or earlier degree," both groups agreed about sanction 4. "Plagiarizing work from a fellow student or publications/internet," both groups agreed with sanction 5. Both groups recommended the most severe sanction, that is, 10 against the 2 behaviors; "Involvement in pedophilic activities – possession/viewing of child pornography images or molesting children" and "sexually harassing a university employee or fellow student."

**3.1.2. Congruence between gender within PrPC (2nd year) and PoPC (3rd year) groups.** Table 2 also shows the comparison (gender-based) of responses as recommended sanctions from the participants. It was found that there was a congruence among both groups (PrPC and PoPC), from a Saudi medical school for the following behaviors.

"Giving help for course work against a teacher's rule," where, both male and females from the 2 groups recommended the similar sanction, that is, 4, however, female participants found to differ in their opinion after the post-course training and as shown to mark a strong sanction (5). For the behavior, "Removing an assigned reference from a shelf in the library to prevent other students," at the PoPC level male students were found to have changed their opinion and found to increase their previous sanction from 5.5 to 6. Furthermore, for the behavior, "Claiming collaborative work as one's individual effort," male students again are shown to change their point of view when they recorded their responses at PoPC level. Moreover, "Forging a healthcare worker's signature on a piece of work, patient chart, grade sheet, or attendance form," no

any changes pre- and post-students strict with their previously recommended sanction 8. Similarly, not any sanction changes reported for the statement, "Sexually harassing a university employee or fellow student and Involvement in pedophilic activities – possession/viewing of child pornography images or molesting children."

### 3.2. Differences in recommended sanctions, at PrPC and PoPC level

We found the sanctions difference between PrPC level (2nd year) and post-PoPC level (3rd year). We collected the information and report below our results comprising on 2 basic measures, firstly for one-level difference secondly for two-levels or more difference in recommended sanctions.

#### 3.2.1. Items with a one-level difference as the median for the recommended sanction.

In this section we reported that one-level stricter sanction was recorded by PoPC level students (i.e., by the students at 3rd year/clinical setting) as median in comparison to their own responses when they were at PrPC level (2nd year/pre-clinical setting), for a total of 11 behaviors (Table 3) and some notable statements are mentioned here; "Signing attendance sheets for absent friends, or asking classmates to sign attendance sheets for you in labs or lectures" (3:4); "Altering or manipulating data (e.g., adjusting data to obtain a significant result)" (6:7); "Failure to follow proper infection control procedures" (6:7); "Completing work for another student" (3:4); "Examining patients without knowledge or consent of supervising clinician" (4:5); "Cheating in an exam by, for example, copying from neighbor, taking in crib material or using a mobile phone or getting someone else to sit for you"

**Table 3**  
PoPC level\* students being one-level stricter for recommended sanctions (median) as compared to PrPC level† students.

S. No	Questions Items	Questions					
		(PrPC level)			(PoPC level)		
		Phase 1, i.e., pre-clinical year			Phase 2, i.e., clinical		
2nd year students (n = 139)	Male (n = 90) (64.7%)	Female (n = 49) (35.3%)	3rd year students (n = 93)	Male (n = 48) (51.6)	Female (n = 45) (48.4)		
1	Signing attendance sheets for absent friends, or asking classmates to sign attendance sheets for you in labs or lectures	3	4	3	4	5	4
2	Altering or manipulating data (e.g., adjusting data to obtain a significant result)	6	6.5	6	7	7	7
3	Failure to follow proper infection control procedures	6	5	6	7	6.5	7
4	Completing work for another student	3	3	3	4	4.5	4
5	Lack of punctuality for classes	3	3	3	4	4.5	4
6	Not doing the part assigned in group work	4	4.4	4	5	5	5
7	Examining patients without knowledge or consent of supervising clinician	4	4	4.5	5	4.5	5
8	Cheating in an exam by, e.g., copying from neighbor, taking in crib material, or using mobile phone or getting someone else to sit for you	7	7	7	8	8.5	8
9	Cutting and pasting or paraphrasing material without acknowledging the source	5	5	5	6	6	6
10	Drinking alcohol over lunch and interviewing a patient in the afternoon	6	5	6	7	7	7
11	Photographing dissection or prosecution or cadaver materials	5	5	5	6	6	5

\* Post-Professionalism Course.

† Pre-Professionalism Course.

(7:8); “Cutting and pasting or paraphrasing material without acknowledging the source” (5:6).

**3.2.2. Items with 2 levels or more difference between pre- and post-course.** Table 4 summaries the 9 statements, indicating unprofessional behaviors, and represents substantial sanction differences (toward the stricter side) in the recommendations between PrPC and PoPC level students. Here 4 of such behaviors are mentioned, “Intentionally falsifying test results or treatment records to disguise mistakes” (5:8); “Providing illegal drugs to fellow students” (7:9); “Joking or speaking disrespectfully about bodies/body parts” (4:7); “Inappropriate representation of Medicine in social media by posting photos/videos/texts about class or clinic activities” (4:6.5).

#### 4. Discussion

The present study investigates the enlightening suggestions gathered while recording the students’ responses as recom-

mended sanctions for unprofessional behavior. This undeniably calls the attention of healthcare stakeholders. In this study, we explored the students’ perceptions while being in phase 1 and phase 2, with clear reflections from behavioral or environmental changes occurring for their understanding of professionalism, especially after the creation and professional growth following a 6-week course. The assessment is based on the evidence composed via a validated instrument, Dundee Polyprofessionalism Inventory.<sup>[14]</sup> Lapses in academic integrity are a widespread concern. Sustaining polished skills appropriately and speedily, providing the required remediation of the emerging lapses among undergraduate students can be excitingly challenging because of the degree of understanding required for such an essential and huge task. Learning time spent in medical school serves as the foundation stone for ethical and moral value carried by future physicians of the society. An international study reported that the medical students who demonstrated unprofessional behavior in medical colleges were more expected to have a consequent College Board disciplinary action.<sup>[14,15]</sup> In our finding emerging

**Table 4**  
PoPC level students being 2 or more level stricter for recommended sanctions (median) as compared to PrPC level students.

S. No	Items	Questions					
		Pre-course responses (Phase 1)			Post-course responses (Phase 2)		
		2nd year students (n = 139)	Male (n = 90) (64.7%)	Female (n = 49) (35.3%)	3rd year students (n = 93)	Male (n = 48) (51.6)	Female (n = 45) (48.4)
1	Exchanging information about an exam before it has been taken (e.g., OSCE)	1	1	2	4	4	4
2	Intentionally falsifying test results or treatment records in order to disguise mistakes	5	5	5.5	8	8	8
3	Providing illegal drugs to fellow students	7	7	7	9	8	9
4	Inventing extraneous circumstances to delay sitting an exam	5	5	4	7	6	8
5	Damaging public property, e.g., scribbling on desks or chairs	4	3.5	4	6	6	6.5
6	Falsifying references or grades on a curriculum vitae or altering grades in the official records	6	5.5	6.5	8	8	8
7	Joking or speaking disrespectfully about bodies/body parts	4	4.5	4	7	7	7
8	Inappropriate representation of Medicine in social media by posting photos/videos/texts about class or clinic activities	4	4	4	6.5	6.5	7
9	Posting inappropriate material about fellow students, teachers, or patients on social media	5.5	6	5	7.5	7	7

from recorded responses in both phases, students found to be well aware and hence recommended sanctions but while in phases 2 (after the course was completed) they were found to recommend a more appropriate sanction. Some previously published studies also reported that the professionalism component of professional development and addressing cognitive and behavioral outcomes.<sup>[16,17]</sup> Similarly, a previous study also reported that Professionalism assessments addressed cognitive and behavioural outcomes.<sup>[18]</sup> In 2012, when the same inventory was used, it was informed that 54 of the Scottish students suggested sanctions in association with lapses in academic integrity.<sup>[19]</sup> Correspondingly, there had been recognized apprehensions concerning academic integrity that necessitate documentation and their solution. The disclosures of our study were consistent with the above findings.<sup>[20,21]</sup> Current study showed that the statements about the academic integrity lapses, were dealt well, *for example*, “Attempting to use personal relationships, bribes or threats to gain academic advantages by, for example, getting advance copies of exam papers or passing the exam by such pressures on staff,” very good in both phases 80% which is high than the previous publish study through the Dundee Polyprofessionalism Inventory.<sup>[22]</sup> Medical professionals, in the long run, were perceived as experts who have had social collaboration and good commitments to satisfy their patients.<sup>[23]</sup> A study publishes in China that clinical education programs for undergraduate students, they reported before teaching medical professionalism, the students were well aware of the professionalism of the medical curriculum.<sup>[24]</sup> A similar report in surveying information and attitudes toward medical professionalism among pre-clinical students demonstrated that there is restricted information but a good attitude toward medical professionalism and formal training, and educational programs must be changed right now.<sup>[25]</sup> Present study also found that pre-clinical (phase 1) students showed a good understanding of professionalism by recommending actions for all of the 34 survey statements. According to Velayo et al,<sup>[26]</sup> the pre-clinical performance is positively correlated with the clinical success of the medical students. Thus, it is essential to inculcate the essence of professionalism among medical students during their pre-clinical training. According to the current study, when the students from phase 1 and phase 2 were compared, a full consistency for 14 (41.17%) statements in the response as median was recorded with additional up to one-level difference in between phase 1 students and phase 2 for 11 (32.35%) statements. Such response consistency among the respondents was also reported in an earlier study, but for the different set of 8 behaviors.<sup>[27]</sup> Present study has reported an interesting finding as students found not to select “ignore” as a recommended sanction in either phase 1 or phase 2 for any of the 34 survey statements. This finding was a notable contrast to the responses collected using the same inventory in the past at various educational institutes, within different geographical locations.<sup>[28]</sup> A study reported after the professionalism course, the medical students’ understanding about professionalism improved=making them more aware about the essential elements, *for example*, patient care, integrity, altruism, etc.<sup>[29]</sup> Similar finding was also reported in our study as phase 2 students recommended higher sanctions as compared to phase 1 student for statements, such as “Exchanging information about an exam before it has been taken (e.g., OSCE)”; “Providing illegal drugs to fellow students”; “Intentionally falsifying test results or treatment records to disguise mistakes.” Our study confirmed the importance of the professionalism

course as the students (after the course) have shown to become more aware and strict with unprofessional behaviors. The authors conclude that teaching of professionalism (especially targeting the pre-clinical students) is an area requiring proper implementation and shall be explored through future research. The authors believe that this study has reported essential findings yet is limited because the comparison of students’ understanding and retention of knowledge was carried out with a year gap. In the future, we aim to conduct it with a larger gap, that is, 2 or more years. For achieving an outcome feasible for the general implementation of current results, we aim to collaborate with other medical colleges in the country and abroad.

## 5. Conclusion

Our study concluded that despite the gap of 1 year, the understanding of professionalism attributes among the medical student did not decline. Moreover, the participants’ responses helped us infer that time laps did not affect many of the professionalism concepts they learned in the past, rather after the transition into the clinical phase, they were more aware of the aspects of professionalism especially related to the clinical settings. These formal educational endeavors should be systematically developed and further enhanced, and one way to do so is by hearing the students’ voice on this topic. It is of note that in the early stages of the medical curriculum, there are serious behavior dilemmas. Therefore, more attention should thus be given toward role modelling and the unprofessional learning environment (if it happens to occur). Our finding also reported that the proper and professional guidance to students resulted in their Professionalism development as evidently, their professional values were increased.

## 6. Recommendation

This study implies the need to conduct robust and long-term projects as a course, which shall allow pre-clinical students to have inculcated and implement professional values as well as develop their professional identities before they become more involved in the community of healthcare practitioners during their clinical rotations at a later stage, during the clinical year.

## Author contributions

**Conceptualization:** Kamran Sattar.

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**Investigation:** Kamran Sattar.

**Methodology:** Ashfaq Akram.

**Project administration:** Kamran Sattar, Ashfaq Akram.

**Resources:** Ulfat Bashir.

**Software:** Tauseef Ahmad.

**Supervision:** Kamran Sattar.

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