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Medical Student Preferences on Examination Scheduling at a US Allopathic Medical School – Survey Study

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Introduction: This study at the University of South Carolina School of Medicine Greenville examines medical students' preferences and concerns regarding exam scheduling, focusing on the schedule's impact on student academic performance and well-being.

Methods: A cross-sectional survey was administered to second, third, and fourth year medical students, receiving a 53% response rate. The survey, consisting of 11 multiple-choice questions and one open-ended question, assessed preferences for exam days, weeks, sequence of different types of exams, and the timing of schedule releases.

Results: Evaluation using descriptive statistics and thematic analysis revealed a strong preference for scheduling Biomedical Science (BMS) exams on Fridays, avoiding weeks with holidays, and separating BMS exams from Integrated Practice of Medicine (IPM) assessments. Students reported that concurrent IPM content delivery during BMS exam weeks negatively impacted their academic performance. Additionally, there was a significant demand for early release of exam schedules to better manage work-life balance. **Discussion:** These findings highlight the critical role of exam scheduling in influencing medical students' academic success and overall well-being, suggesting the need for early communication of schedules and equitable assessment planning. Keywords: calendar, exam, scheduling, student preference, well-being

Introduction

Medical education is a rigorous process that involves extensive studying, intensive clinical training, and detailed examinations. These elements significantly influence medical students' academic performance, well-being, and nonacademic plans. However, there is a lack of comprehensive understanding of students' preferences and concerns regarding exam scheduling, an integral part of this process.

Research has shown medical students experience high levels of stress and burnout, which can detrimentally affect their mental health and professional development.^{1,2} Depersonalization, characterized by emotional detachment and a sense of being an outside observer to one's thoughts or body,³ often increases early in medical education with minimal regression after its onset.⁴ This deterioration in well-being can erode key attributes of medical professionalism, such as altruism, empathy, and overall health, potentially impacting both current learning abilities and future patient care.^{5–10}

Academic exams are a significant source of stress for medical students. In response, both major United States medical licensing bodies, United States Medical Licensing Examination (USMLE) Step 1 and Comprehensive Osteopathic Medical Licensing Exam (COMLEX) Level 1, have transitioned from a numeric scoring system to a Pass/Fail designation to alleviate stress and improve student well-being.^{11,12} Despite this, the impact of exam scheduling on student wellbeing and performance has received less attention.

Exam schedules, traditionally not considered a major stressor, play a crucial role in influencing students' academic performance and well-being. Factors such as timing, frequency, and sequencing of exams can either exacerbate or mitigate stress. Understanding students' preferences and concerns regarding exam scheduling is essential for improving their educational experience. Studies have highlighted several preferences and impacts related to exam scheduling. For instance, Jayakumar (2016) found that medical students significantly preferred exams on Fridays, linking this preference to improved quality of life, work-life balance, and mental health.¹³ Similarly, Schmidt (2022) demonstrated that back-to-back exam scheduling negatively impacted student performance and satisfaction, suggesting the need for well-integrated and spaced-out exam schedules.¹⁴ Moreover, Peyton (2023) identified that learning preferences and satisfaction with curricular elements can vary significantly, indicating that a one-size-fits-all approach to exam scheduling may not be effective.¹⁵

The pre-clerkship curriculum at University of South Carolina School of Medicine Greenville (USC SOMG) consists of 4–8-week Biomedical Science (BMS) modules combined with weekly Integrated Practice of Medicine (IPM) days. The BMS modules culminate in a summative exam. The exam comprises close to 100% of the student's grade for that module and thus significantly impacts students' grades and class rankings.

The BMS module grades are recorded in the students' transcripts as a satisfactory/unsatisfactory, however, the students' final total percent grade is used for class rankings, $A\Omega A$ honors society eligibility, and is provided to the student as feedback. The IPM modules are graded similarly with the addition that students in IPM Ib and IPM IIb are eligible for a "Pass with Honors" distinction added to their transcript and the Medical Student Performance Evaluation (MSPE).

Pre-clerkship IPM is designed to prepare medical students for clinical exam proficiency, procedural skills, knowledge of appropriate diagnostic studies, application of evidence-based practice, and understanding of behavioral and social science aspects of health and healthcare delivery. It also emphasizes demonstrating conscious professionalism, effective communication, and the ability to reflect upon and improve their skills. IPM summative testing occurs once per semester in the form of an Objective Structured Clinical Exam (OSCE). Students are assigned one 4-hour time slot in one of three consecutive days in which to complete this examination. At USC SOMG, BMS exams are often scheduled for the same week as IPM OSCEs. Following their final M2 exam, students are provided 6 weeks of dedicated study time for the USMLE STEP 1.

Objectives

This study aims to enhance understanding of medical students' preferences regarding examination scheduling through a survey conducted at USC SOMG. The survey examines preferences for the day and week of exams, the sequence of different types of exams, and the timing of exam schedule releases. Additionally, it assesses impact of exam schedules on students' perceived academic performance, well-being, and non-academic plans.

By gaining insights into students' perspectives, this study aims to inform improvements in exam scheduling processes to better align with students' needs and preferences. The findings will aid in creating an examination schedule that allows for better exam preparation, better organization of the learning process, decreased stress, and more effective use of time between courses. This will also provide greater flexibility for extracurricular activities, Emergency Medical Technician shifts, and vacation time. This is particularly relevant in light of the increasing recognition of the importance of student well-being in medical education. Furthermore, the findings aim to provide useful insights for other medical schools and contribute to the broader discourse on best practices in medical education scheduling.

Materials and Methods

Design

A survey instrument was designed and used to assess student perspective on exam scheduling. The questions were created based on discussions from a Program Evaluation and Assessement Subcomittee (PEAS)-sponsored focus group meeting in August 2021 and input from various stakeholder faculty and administrative members.

Question topics included exam scheduling preferences, the impact of the exam schedule, and the timing of release of exam schedules. There were 11 multiple choice questions and one open-response question. Multiple-choice questions that might have prompted an unlisted response had an "Other" option for the respondents to voice their specific response.

The target groups for the survey were current M2, M3, and M4 students. The M1 class was excluded due to their lack of experience with respect to some aspects of the survey content. For example, at the time of survey administration, the first year medical students had not had their first OSCE exam.

Administration

The survey was delivered via Survey Monkey by the Office of Assessment, and was open for 19 days, from October 15th to November 4th, 2021.

Ethical Considerations

The analysis was conducted in a manner that ensured the anonymity of the respondents, aligning with ethical guidelines for survey research. Prior to starting the survey, students consented to the following statement regarding participation; This anonymous survey is intended to provide additional information on the student feedback received from a small focus group of M1/M2 students. This information is immediately intended for presentation to faculty on the Program Evaluation and Assessment Subcommittee meeting. However, the results may also be used in different settings.

Please place a checkmark in the box indicating you agree with the following statement:

I understand that I am providing anonymous feedback on this survey, and that this survey is intended for the purposes of curricular development. I consent to the inclusion of my anonymous results for these purposes. Participation in this survey is voluntary.

The USC Office of Research Compliance, on behalf of the USC Institutional Review Board, determined that the study is not subject to the Protection of Human Subject Regulations in accordance with the Code of Federal Regulations 45 CFR 46 et seq.

Analysis

The survey results were collected and compiled by the Assessment team in the Office of Academic Affairs. The data collected from the survey responses were analyzed using descriptive statistics to summarize the main characteristics of the responses.

For multiple-choice questions, the count of each choice was calculated to identify the most and least popular options. For questions with "select all that apply" options, the number of times each option was selected was counted.

For open-ended questions, rigorous thematic analysis was conducted to ensure reliability and validity. This qualitative analysis involved the following steps:

- 1. Familiarization: Responses were read multiple times to become familiar with the content.
- 2. **Coding**: An inductive approach was used to code the data. Initial codes were generated by highlighting significant phrases and words in the responses.
- 3. **Theme Development**: Codes were reviewed and grouped into potential themes. This step involved searching for patterns and overarching themes that accurately represented the data.
- 4. **Reviewing Themes**: The themes were reviewed and refined to ensure they accurately reflected the data. This step involved checking if themes worked in relation to the coded extracts and the entire data set.
- 5. **Defining and Naming Themes**: Themes were defined and named to clearly illustrate the essence of what each theme represents.
- 6. **Reporting**: The final step involved organizing the themes into a coherent narrative that provides a deeper understanding of the respondents' perspectives and experiences.

Results

Performance

The survey received 166 responses, comprising a 53% response rate. Specifically, 104 responses came from the M2 class, representing a majority of the answers and nearly all of the students in that cohort. Additionally, 30 and 31 responses came from the M3 and M4 classes, respectively. One response (Other) was from a student on a leave of absence. A percentage breakdown of the responders is illustrated in Figure 1.



Figure I Pie-chart of Survey Respondents by Class.

Responses

Assessment Scheduling

1. Preferred Day for BMS Summative Exams

As shown in Figure 2A, 92% of students preferred BMS summative exams to be scheduled on Fridays. The next most popular option was Thursday, (3.3%).

2. Preferred Week for BMS Summative Exams

Figure 2B indicates that 55.3% of respondents preferred to have the BMS summative exams on weeks without scheduled days off or holidays. A combined 44.6% of students either had no preference or preferred exams on weeks with scheduled holidays.



Figure 2 (A) Responses to Question 1, (B) Responses to Question 2, (C) Responses to Question 3, (D) Responses to Question 4, (E) Responses to Question 5, (F) Responses to Question 6, (G) Responses to Question 7.

"Holidays" was clarified to indicate days recognized by the school's academic schedule such as Labor Day and Martin Luther King Day.

3. Timing of BMS Summative Exams Relative to Academic Breaks

According to Figure 2C, 94% of students preferred exams to occur before extended breaks rather than after. Eight students (5.3%) expressed no preference and one student (0.7%) preferred exams after breaks.

4. Scheduling of OSCE and BMS Exams

Figure 2D shows that 77.3% of students preferred OSCEs to be separated from BMS exams by at least one day or to be scheduled in different weeks. 14% preferred the exams to be on concurrent days.

*Students who indicated that they would prefer the assessments to occur on different weeks were given question 5 in order to clarify their response.

*5. Further Clarification of Different Weeks

Of the subset who preferred different weeks (49 replies), 24 (49%) did not want additional days added to the calendar for this separation, while 25 (51%) either had no preference or preferred adding extra days (Figure 2E).

6. Preparation for Exams Scheduled in the Same Week

As depicted in Figure 2F, 62%, of students felt more prepared for the BMS exam than the OSCE exam when both were scheduled in the same week.

7. Perceived Impact of IPM Content on Academic Performance

Figure 2G shows that students indicated the amount of IPM content negatively impacted their academic performance during weeks of BMS exams. IPM content and assignments were clarified to include "Standardized Patient encounter, case presentations, etc".

Academic Calendars

8. Importance of Receiving Module Calendars

Figure 3B illustrates that 75% of students believed that it was important or very important to receive module calendars at the beginning of the semester, even though these calendars were subject to change.

9. Key Information in Overall Schedule

According to Figure 3A, students prioritized knowing BMS summative exam dates (96%), module start and end dates (83%), OSCE dates (79%), school recognized days off (66%), and the last day of required attendance (62%).

This was the sole "select all that apply" question on the survey and was designed to give the administration insight into which events are most important to the students when looking at their schedule for the semester.

Students were given the opportunity to submit their own responses. Two students re-iterated the need to have a schedule ahead of time. One student noted that all aspects of the schedules should be made available. One student noted that knowing which IPM events were in-person or virtual would be helpful.

We have no control over these schedules and have very limited true time off. It is very important to student success AND wellbeing for things to be planned well in advance.

I feel we have the right to know all aspects of our schedule, considering they are already in place a year before we receive the info. It shouldn't be some aspects - we should get all. Real world people know their schedules, med students shouldn't have to wait til Friday to know what is coming Monday.

Whether IPM sessions before breaks will be virtual or in person. People who cannot drive home, end up with VERY expensive plane tickets because we never know if we will need to be in-person, or if it'll be virtual.

10. Preferred Timing for Release of Module Outlook Calendars

As shown in Figure 3C, students preferred to receive their schedules at the beginning of the academic year. Respondents were offered the opportunity to submit their own responses.

Two weeks prior

As long as I know required attendance events (formatives, lab) well in advance than no preference for outlook calendar



Figure 3 (A) Responses to Question 9, (B) Responses to Question 8, (C) Responses to Question 10, (D) Responses to Question 11.

I would prefer the beginning of the year but I know that's a lot of work, so a month before the course would be acceptable.

11. Preferred Timing for Release of OSCE Schedule

Figure 3D shows that 43% of students preferred the OSCE schedule to be released at least a month before the event, while 37% preferred the schedule to be released at the beginning of the academic year.

Students had more to share on this topic.

Doesn't matter, just before the OSCE

No preference

2-3 weeks before OSCEs

Again, we are making travel plans based off these OSCE dates. It should be the responsibility of the coordinators to send schedules out as far in advance is at all possible. I know that we are technically scheduled to stay for the last day of scheduled osces, but knowing when we will have a RARE long weekend is so so important to our happiness. No reason to make medical school more stressful than is necessary.

A lot of students "gamed" the system so they could start their break sooner than others. This is really frustrating to students who were unable to change their schedule. I'm not sure what the solution is, but there should be some sort of equity.

I don't need like my personal schedule at the beginning of the year but getting the general dates at the beginning of the year especially for the fall ones would be helpful as far as family planning for holidays

12. Open Ended Responses

The survey's open-ended question received 39 responses, which were analyzed thematically to identify common themes: BMS Exam Scheduling, IPM OSCE Scheduling, Test Week Challenges, Schedule Access, Other Scheduling Comments.

BMS Exam Scheduling

Students had mixed preferences for the day of the week for BMS exams. Some found Fridays stressful, while others appreciated having exams on Fridays for mental health reasons. There was a common preference to avoid exams during weeks with holidays.

Taking exams on Fridays is awful because the weekend after an exam is the only true break we get and many students spend the weekend stressed about whether or not they passed...

Please keep as many summative assessments on Fridays as possible! Having a weekend without studying is so, so important for our mental health.

With regards to holidays, multiple comments reiterated a desire for tests to be avoided during weeks with holidays. The central theme was a desire to be able to use the day off for leisure instead of using the time to study for an upcoming exam.

Exams on the weeks of holidays where we have scheduled time off school are really inconvenient. Spending Labor day, memorial day, etc with family and friends is important.

Having a test on the same week of Labor Day/MLK day does not allow us to use our weekend to go somewhere and enjoy ourselves because we are studying all day.

IPM Content Impact on BMS Exam

Regarding IPM sessions during text weeks, students had much to share about the amount and type of content covered during the IPM sessions held during the same week as the BMS exam.

Students indicated that they would rather not have Standardized Patient Encounters (SPs) or assigned work due that week. Instead, students state they would prefer IPM time to be used to review clinical skills and procedures or review clinical cases applicable to the upcoming exam.

Having IPM on test weeks is stressful but if it has to be done, it would be great to not have to perform an SP encounter. I would much rather have US or practice skills than have to perform on a test week

we deserve the time and space to do our best. As such, I think sensitive exams should be scheduled for non- test weeks.

"If IPM was scheduled for exam prep week, I would like this IPM session to drill in clinical cases that have exam content in mind, so drugs or procedures.

It is very frustrating to have IPM requirements during the week of a summative BMS exam. The schedule often benefits some students more than others. (early SP time, early to leave campus for studying, etc)

Several students also expressed a desire for reduced hours spent in IPM sessions during BMS test weeks.

Holding us from 8am-5pm on IPM days prior to exams is stressful. While I do not think it has significantly impacted my performance personally, it did cause undue stress...

I think the less required time during test weeks, the better, including IPM. No IPM during test weeks would be great if the OSCEs were moved to a different week.

Simultaneous Week Scheduling of BMS and OSCE Exams

Students generally preferred BMS and OSCE exams to be held in different weeks, citing negative impacts on mental health and academic performance when scheduled together.

I think the OSCEs and BMS exams occurring in the same week are extremely detrimental to mental health and academic performance.

If we do OSCEs and BMS exams a week apart PLEASE DO NOT have OSCEs during study week for BMS

I think that having our OSCEs and exams, like shelf exams, during the same week is better for third year instead of first and second year...

I think IPM should be it's own block so we can focus on it, and have OSCEs after like it's own summative so people can give it the attention it deserves.

...having an exam followed by an OSCE the next day, or three days later, is not fair and truly offers an advantage to the students who don't have a 24hr turn around between the exams.

I selected that OSCEs should be in the same week as the summative exam because that was the best of the options presented but I actually think that the exams should always be on fridays and then OSCEs should be the following Tue-Thur or Wed-Fri.

Schedule Access

Students emphasized the importance of having full-year schedules, particularly for mandatory in-person dates, to better manage travel and personal plans.

In the business world, most people at least have a rough outline of their schedule as far out as they need. There's no reason to withhold our schedule from us - it gives a lack of control over our own lives feeling that we don't deserve. Thank y'all for reconsidering how this is handled.

Just have a good schedule and let students know what they need to be doing up front and in a timely manner.

I would also find a calendar of all summative/mandatory-in person dates to be available prior to the start of the school year, not only on Outlook but also on a PDF like the school calendar is.

The most important thing for me is knowing when it is mandatory to be in school in person. This would help TREMENDOUSLY with travel arrangements, since buying flights earlier is way better than later.

Discussion

Summary of Results

Scheduling Preferences

Our survey results indicate that students overwhelmingly prefer BMS summative exams to be scheduled on Fridays, during non-holiday weeks, and before extended breaks. This preference likely stems from a desire to maximize rest periods and reduce stress. Specifically, 92% of students favored Friday exams, and 94% preferred exams before extended breaks such as Thanksgiving, Winter, and Spring breaks. Over half of the students also preferred exams to avoid weeks with school-recognized holidays.

Students also expressed a strong preference for separating OSCE and BMS exams by at least one day or scheduling them in different weeks. This preference highlights the difficulty in adequately preparing for both types of exams concurrently. Students who had an OSCE the day after a BMS exam reported feeling less prepared, indicating a need for better scheduling to reduce this stress and potential inequity.

Regarding the impact of IPM content during BMS exam weeks, students reported that the volume and nature of IPM assignments negatively impacted their perceived academic performance. They suggested reducing IPM requirements or aligning them more closely with the content of upcoming exams to mitigate this stress.

Academic Calendars

A significant finding from the survey was the importance students placed on receiving their schedules well in advance. Seventy-five percent of students emphasized the need to receive module calendars at the beginning of the semester, despite potential changes. Key dates such as BMS summative exams, module start and end dates, OSCE dates, school-recognized days off, and the last day of required attendance were highlighted as essential for effective planning and reducing stress.

The scheduling issues identified in our study are not unique to our institution. Similar preferences for exam scheduling have been noted in other studies. For instance, Jayakumar (2016) found that medical students significantly preferred exams on Fridays, linking this preference to improved quality of life and mental health. Our study aligns with these findings, suggesting that certain scheduling preferences may be broadly applicable across different medical schools.

Despite an extensive literature search, we found limited research specifically addressing exam scheduling preferences in medical education. The few studies available, such as those by Jayakumar (2016) and Schmidt (2022), primarily focus on preferred days of the week and the impact of block scheduling. This gap highlights the need for further research in this area to develop best practices for exam scheduling that can be applied universally.

Several students raised concerns about perceived inequities and the ability to "game the system" within the current exam scheduling framework. For example, students who had more time between BMS and OSCE exams felt they were at an advantage. To address this, a more standardized approach to scheduling could be implemented, such as administering exams over multiple days with equivalent versions to avoid information sharing. Another approach could be a lottery system for scheduling, ensuring fairness while maintaining advance notice.

Limitations

Our study has several limitations including those common to survey-based studies including response bias, a crosssectional design, and self-reported data. It is based on self-reported data from a single institution, which may limit the generalizability of the findings. Additionally, the survey had an overrepresentation of M2 students, who are most affected by pre-clinical testing schedules. While this focus is relevant, it may skew the results. The cross-sectional design and the reliance on a single open-response question also limit the depth of the qualitative data obtained.

Another limitation is the potential lack of transparency from students despite assurances of anonymity. Concerns about anonymity may have influenced the candor of responses, although this effect is difficult to measure.

Conclusions

The main findings of the survey show that students find the scheduling of assessments and the information about the dates of assessment to be integral to their mental health and academic performance. As such, the planning and scheduling of assessments in medical school must be made with care and acknowledgement of student preferences.

The results of this survey have identified sources of frustration and stress with regards to the scheduling of examinations during medical school. These results have wide-ranging impact including on administrative planning, student well-being, academic performance, transparency and communication, and equity.

While there may be limited scheduling options for the labyrinthine complexity of modern medical school mechanics, creative problem solving and flexibility can provide well-received solutions. Given that the schedule has a significant impact on student well-being and academic performance, student preferences should be taken into account when creating the academic calendar.

When current scheduling practices may advantage one group of students over another, changes must be made to provide a fairer testing environment.

Suggested Changes

There are several suggested changes or recommendations that could be made from the results.

- Maximize exams held on Fridays, non-holiday weeks, and before extended breaks.
- The OSCE exam should be separated from the BMS exam by at least a day.
- No days should be added to the overall schedule to achieve this goal.
- Reduce or rearrange IPM material presented during weeks of BMS summative exams to have less required time and sessions more targeted to preparing for the summative.
- Release all module Outlook calendars to students at the beginning of the academic year.
- Release the OSCE schedule at least a month before if not at the beginning of the academic year.
- Release a comprehensive calendar for the year that contains at least BMS summative exam dates, module start and end dates, OSCE dates, school recognized days off, and the last day of required attendance.

One possible solution, seen in Figure 4, for BMS tests occurring the same week as the OSCE would be the administration of the BMS exam over three days. This would allow every student the same number of intervening days before their OSCE exam while keeping examinations on the same week. However, the BMS exams would need to be similar but not identical to avoid the creation of a new inequity with the possibility of students sharing information, despite a strict honor code. In addition, some students would have even more time to study. Perhaps a better solution is an initial voluntary sign up for the Wednesday exam, followed by a lottery while maintaining advance notice of at least one month.

Future Research

Future studies should explore the implementation and impact of these recommendations through longitudinal studies. This approach would track changes in student preferences and performance over time, and in response to changes in scheduling practices. The results of this study could also identify any new hurdles that potentially develop due to these changes. Additionally, qualitative research could be used to provide a more nuanced understanding of student perspectives. In-depth interviews or focus groups would gain a deeper understanding of students' experiences and perspectives on scheduling issues. Finally, comparative studies involving other medical schools would be particularly valuable. Comparing and contrasting the scheduling practices and student outcomes at different medical schools could provide insights into the effectiveness of different approaches.



Figure 4 Alternative Exam Administration Schedule.

By addressing these scheduling preferences and issues, especially when planning curricular revisions, medical schools can create a more supportive and effective learning environment, ultimately contributing to better educational outcomes and student well-being.

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Disclosure

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