ORIGINAL ARTICLE

# The Association Between Learning Styles, Time Management Skills and Pharmacology Academic Performance Among First Year Medical Students in Universiti Putra Malaysia (UPM) During the COVID-19 Pandemic

Azmah Saat, Suryati Mohd. Thani, Safuraa Salihan, Nur Izah Ab. Razak, Siti Saleha Masrudin

Department of Human Anatomy, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

**ABSTRACT**

**Introduction:** The scientific understanding gained from pharmacology investigations is used to support a wide range of medical therapies. As a result, pharmacology is essential in medicine. As a result of the coronavirus epidemic, several colleges throughout the world have resorted to online pharmacology learning, which has an indirect impact on student academic progress. Aside from learning styles, a student's time management abilities are another essential aspect that affects their academic success. **Methods:** This is a cross-sectional study that employed a questionnaire to assess first-year medical students from Universiti Putra Malaysia's Faculty of Medicine and Health Sciences' learning style and time management skills. A series of pharmacological questions involving short answer questions was also given to the students to assess their pharmacology performance. **Results:** There was a significant weak negative correlation between superficial learning style and pharmacology performance ($r=-0.272$, $p<.05$). There was also a significant weak correlation between deep learning style and long range planning ($r=0.256$, $p<.05$) and including short range planning ($r=0.263$, $p<0.5$). Lastly, significant weak negative correlation on pharmacology performance and long range planning was seen ($r=0.256$, $p<.05$). However, there was no significant correlation between time management and pharmacology performance. **Conclusion:** Students that use a superficial learning style struggle in school, yet deep learning styles in both short and long term planning do not always increase pharmacology performance. A good time management skills does not guarantee a good pharmacology performance either. Other relevant factors, like as socio-demographic characteristics, that may contribute to this outcome, particularly during this epidemic, should be investigated further.
Malaysian Journal of Medicine and Health Sciences (2022) 18(14)94-103. doi:10.47836/mjmhs18.s14.11

**Keywords:** Learning style, Time management, Pharmacology performance, COVID-19

**Corresponding Author:**
Azmah Saat , PhD
Email: azmahsaat@upm.edu.my
Tel: +60192755432

## INTRODUCTION

Coronavirus disease (COVID-19) has caused mayhem in medical schools and healthcare facilities all around the world (1). Due to the virus's high contagiousness, the education system has been unable to continue lectures as usual, impacting the medical education process, which is mostly lecture-based and patient-centred (2). Patients are at risk of contracting life-threatening infections as a result of the COVID-19 pandemic, which presents substantial challenges for medical education, as the instructors must give lectures safely while retaining the educational process's integrity and continuity (3). Another concern is that medical students may contract the virus while undergoing training and then disseminate it to the rest of the community (4). Students must also stay at home and adhere to social distancing rules. During the COVID-19 pandemic, online learning and examinations compel students to swiftly transition to a new mode of learning, potentially resulting to different learning styles and time management skills than before the epidemic (5).

Students differ in terms of the best form of study for them, resulting in a preference for certain approaches over

others, according to the concept of "learning styles." (6). There are two categories of learners which include superficial approach (SA) and deep approach (DA) learners (7). Several studies have looked into the link between academic success and learning styles (9,10). According to past studies, the prevalence of detecting an individual's learning style preference and modifying instructions accordingly is expanding among educators, parents, and students themselves.

DA learning styles among students aim to comprehend the concepts and associated ideas. Meanwhile, SA learning focuses on memorisation as they are mainly concerned with obtaining marks and passing (11). Students' learning styles can be used to discover more about their preferences. Understanding learning styles may make it much easier to create, alter, and improve more efficient pharmacology lectures (8). As a result, understanding one's learning style is critical for more successful learning (9).

Learning style is not the singular factor in determining academic performance despite its notable significance. Achievements in medical school may also be contributed by time management skills. Time management skills are a critical component of medical students' success as students who exercised proper time management skills have demonstrated better academic performance (12). Cumulative grade point average in college courses often relies only on the skills in controlling compilation of a complex mix of tasks given, whether in priorities, deadlines, length, or others (13). Nonetheless, Adebayo (2015) deduced that students frequently do not utilise their time carefully. Consequently, students are not able to manage their assignments and responsibilities or even fail their examinations (14). Therefore, an excellent practice of time management will positively affect the academic performance of students (15).

This study uses a pharmacology evaluation to investigate if the learning styles and time management skills of first-year medical students are predictive of their overall academic achievement levels. One of the most essential branches of medicine, pharmacology, has been taught since the preclinical years. Abdulghani and Al-Naggar, (2015) looked into how medical students felt about learning pharmacology. In this study, 150 medical students from Malaysia's Management and Sciences University were picked at random. The majority of the students who took part in this study had a positive view of pharmacology teaching and learning. The average percentage of those who agreed was significantly higher than the average percentage of those who disagreed (16).

Medication mistakes are thought to be responsible for about 7000 deaths each year in the United States (17). According to recent estimates, adverse medication reactions caused by prescription errors cause or contribute to as many as 2420 deaths in the United Kingdom each year (18). Although a multitude of circumstances might contribute to pharmaceutical errors (19), understanding drugs and prescribing training are essential (20). Indeed, it was stated that newly graduated doctors lacked adequate drug knowledge (21). Flaws in the pharmacological knowledge that supports prescribing could be a major cause to pharmaceutical errors, according to study filed to the UK General Medical Council (22). Medical students and graduates have selected pharmacology as a subject that requires more emphasis in their education (23, 24). Thus, using pharmacology as a metric to assess academic achievement in this study among medical students will boost medical students' knowledge of pharmacology.

The academic performance of a medical student draws the attention of everyone involved in medical education. Many stakeholders in medical education are concerned about students' academic achievement since it represents their diverse areas of interest. Furthermore, one of the fundamental purposes of education has always been to improve students' results. Many research have been undertaken to determine the factors that influence student achievement (positively or adversely). Finding those components and the connections between them is a difficult task. Achievement is influenced by student traits, lifestyle, learning environments, and instructional activities (25). In addition, academic achievement is related to study abilities, study habits, study attitudes, and study motivation (26). As a result, there are numerous contributing aspects that go into ensuring strong academic achievement. This study, on the other hand, will exclusively focus on the pharmacology assessment performance's, learning methods and time management abilities.

Previous academic achievement, personality factors, and individual variances in cognitive learning techniques are all major drivers of academic success in medical school, especially during the COVID-19 pandemic, when online learning is difficult (27). Medical students, as one might expect, face more difficulties these days, as the study load has increased significantly as a result of medical developments. As a result, some kids keep failing exams, requiring them to repeat the school year. In this regard, educational stakeholders are concerned about the reasons of achievement gaps and want to know how they might be narrowed. As a result, we looked into the impact of learning styles and time management skills on academic performance among first-year medical students at Faculty of Medicine and Health Sciences (FMHS), UPM.

The goal of this study is to find distinguishing features that can help medical students achieve better pharmacology assessment results, whether through a more effective learning style or better time management abilities.

## MATERIALS AND METHODS

### Ethical Consideration

This study received ethical approval from the Universiti Putra Malaysia Ethics Committee for Research Involving Human Subjects (JKEUPM) on August 7, 2020, with the reference number JKEUPM-2020-211. The students were informed that participation was voluntary and that they had the right to refuse in person and via the form. The respondents were required to sign a consent form before they could begin answering the questionnaire questions.

### Study Design

From May to June 2020, a cross-sectional questionnaire survey was conducted among first-year medical students at FMHS, UPM. A collection of pharmacology questions, consisting of short answer questions (SAQ), were used to evaluate academic achievement. Students were given 30 minutes to use the online platform to answer the questions.

### Study Setting

Respondents were collected among first-year medical students at FMHS, UPM, between May 1 and September 30, 2020. All first-year medical students enrolling in Semester 2 of the 2019/2020 academic year met the inclusion criteria, while repeaters met the exclusion criteria.

### Sample Size

The sample size was calculated by using a two-proportion formula based on previous research done by Hamoud et al., (2017), which determined the significant association between time management skills and academic performance with r=0.331 (29). The study was using the probability simple random approach towards these 109 first year medical students (population size). The estimated sample size was derived by employing Fisher's arctanh transformation in Formula 1 (Eq. 1) below.

$$C(r) = \frac{1}{2} \ln \left( \frac{1 + r}{1 - r} \right)$$

Given a sample correlation r based on N observations that is distributed about an actual correlation value (parameter) $\rho$, then C(r) is normally distributed with mean C($\rho$) and variance $\sigma^2 = 1/(N - 3)$.

Under the null hypothesis, the test statistic is $Z = C(r)\sqrt{N - 3}$ where $Z \sim N(0, 1)$

The sample size to achieve specified significance level and power is as stated in the Formula 2 (Eq. 2) below.

$$N = \left( \frac{Z_\alpha + Z_\beta}{C(r)} \right)^2 + 3$$

Where $z\beta$ is the upper 100(1-p) percentile of the standard normal distribution.

N = Sample size
$Z\alpha$ = Z-score with a 95% confidence interval, 1.96 ($\alpha$=0.05)
$Z\beta$ = Z-score probability of type II error, 0.84 ($\beta$=0.2)
r = Correlation coefficient of previous study

From the Eq. 2 : three data were selected as guidelines for the sample size estimation (28, 29, 30). Calculation has been done based on the Eq. 2. The estimated sample size of n = 69 was chosen for being the largest number lesser than the population (27).

To strengthen the sample size, 20% of non-response rate is added,

20% × 69 = 13.8 (≈ 13 non responding)

n = 69 + 13
n = 82

To further strengthen the power of the sample size, a 5% exclusion rate is added (eg. failure in semester 1),

5% × 82 = 4.1(≈ 4 excluded from the study)

n = 82 + 4
n = 86

Thus, a sample size of around 86 was chosen.

Thus, based on the Eq. 2 and previous study, a sample size of 86 participants was chosen. This was based on a confidence interval of 95%, and a power of 80%.

### Sampling Method

Throughout the data collection period, a probability simple random sampling method was utilised to acquire the data. The students were given a number between 1 and 109, and an estimated sample size was determined using the Excel RANDBETWEEN function (i.e. 86 study samples) from the population with no repetition. Each of the responses had an equal chance of being chosen. During the data collecting period, they were asked to complete a set of questionnaires as well as a set of pharmacological question.

### Data Collection

A questionnaire entitled "A Cross-sectional study on the Learning Styles of Year 1 Medical Students: Association

between Approach of Learning Styles, Time Management Skills and Academic Performances Among UPM First Year Medical Students 2020" that consists of 2 sections was implemented. 109 self-administered, validated questionnaires were sent online to participants in phase 1 of the data collecting period using a pre-designated Google form link. The questionnaire, which included 35 questions, was used to measure respondents' learning styles as well as their time management abilities.

A questionnaire consisting of 36 questions was developed by the combinations of the revised two-factor study process questionnaire (R-SPQ-2F) and time management questionnaires (TMQ). The learning style had two subscales as indicators of two latent factors, namely DA, and SA. While TMQ studied the time management skills of the students based on three factors: (1) Time attitude (2) Short range planning (3) Long range planning. The studies would determine which learning style will be more likely related to the respondents, together with their time management skills. Each individual ought to choose which suits themselves the most.

A five-point Likert scale was used in the questionnaires.
(1) This item is never or only rarely true of me;
(2) This item is sometimes true of me;
(3) This item is true of me about half the time;
(4) This item is frequently true of me;
(5) This item is always or almost always true of me.

The scoring for each question attributes to a cumulative set of scores under 4 distinct indicators. The set of questions which confers these 4 distinct indicators rotates in the cyclical order of 1. Deep motive, 2. Deep strategy, 3. Superficial motive, 4. Superficial strategy. The cumulative score of this data will then give us the final result of the corresponding learning style using the formula:

Deep approach score: ∑all deep motive scores + all deep strategy scores
Superficial approach score: ∑all superficial motive scores + all superficial strategy scores.

The learning style is categorized into a SA and DA of learning. The first 16 questions from the questionnaire were meant to evaluate different learning styles. From the 16 questions of the R-SPQ-2F sections, 8 of the items reflected SA and 8 of the questions reflected a DA. For each approach of learning style included, the lowest score is 8 and the maximum score is 40.

The time management skills are categorized into time attitude, short-range Planning, and long-range planning. The subsequent 18 questions from the questionnaire were meant to evaluate different time management skills. The first 7 questions were meant to be short-range planners (lowest score from 7 to a highest of 35), the next 6 questions were for time attitudes (lowest score from 6 to a highest of 30) and the remaining 5 questions were for long-range planners (lowest score from 5 to a highest of 25). The data was converted into percentage to ease the comparison between each entity. The highest of each three time management skills would be chosen to be the most frequently implemented time management skills for each respondents.

The academic performance of each first-year medical student was assessed based on the scoring of a pharmacology SAQ questions distributed. The pharmacology questions were created in the same manner as the general biochemistry and pharmacology module in the medical curriculum of Faculty of Medicine and Health Sciences, UPM. The participants were given a week to prepare before completing the evaluation, which was plenty of time considering that the students answering the questions had recently concluded their general biochemistry and pharmacology module, which is closely related to the questions asked. They were given 30 minutes to complete the assessment, which was done online using the Google form and Google meet platforms. To ensure that bias was minimised, only one examiner marked the answer papers. The total marks for the assessment were 100 percent. For the academic performance variable, the total score received by each student (in percentage) was further categorized into 3 categories (weak, moderate, excellent) based on the quartiles of marks obtained by the students with 25 quartiles of a SAQ score of 40 and 75 quartiles of a SAQ score of 80. Those who had less than 40 would be considered weak, average were those in between 40 and 80 and excellent if the marks were more than 80.

**Validity and Reliability**

The scales of deep approach and surface approach and their subscales in the (R-SPQ-2F) questionnaire demonstrated by a study showed an internal consistency that was good with a range of Cronbach Alpha values between 0.80 and 0.76 (31). The questionnaire used for TMQ in the current study had good and acceptable internal consistency reliability, with a range of Cronbach Alpha values between 0.775 and 0.836 (32).

Some questions were added to the questionnaire in the current study to better fit our needs. To complete the face validation portion of this study, a study was done with 10% of the total sample population. The survey was conducted among preclinical first-year medical students at Universiti Sains Islam Malaysia, and the respondents who took part in the study were excluded from the sampling data. All questions were answered without any missing answers and no queries from the students. The reliability test was done by using Cronbach's Alpha. The Cronbach's Alpha was used to measure the internal consistency. With Cronbach Alpha scores ranging from 0.655 to 0.823, the questionnaire had good and acceptable internal consistency reliability.

## Data Analysis

For data analysis, data entry, clean data, and normality testing, the Statistical Package for the Social Sciences (SPSS) version 26.0 was utilised. To determine the normality of the numerical data for variables such as 'Learning Style,' 'Time Management Skill,' and 'Pharmacology Assessment Result,' the Kolmogorov-Smirnov test of normality was used to evaluate the obtained data. Pearson's product-moment correlation was utilised to find a link between learning styles, time management skills and academic success. The following classification was used to determine the strength of the correlation: $0.1 < |r| < 0.3$ denotes a weak correlation, $0.3 \leq |r| < 0.5$ denotes a medium connection, and $|r| \geq 0.5$ denotes a strong correlation.

## RESULT

### Types of Learning Style, Time Management Skills and Pharmacology Assessment Performance

Fig. 1 showed that out of 89 students, the majority (68.5%) were superficial learners followed by deep learners at 31.5%. Fig. 2 revealed that most of the students (56.2%) were short-range planners, while some (24.7%) had good attitude on time usage, and the rest (19.1%) were long-range planners. Based on the pharmacology assessment findings in Fig. 3, most of the students were classified as average students (48.3%), excellent students (25.8%), and weak students (the remainder) (25.8%).

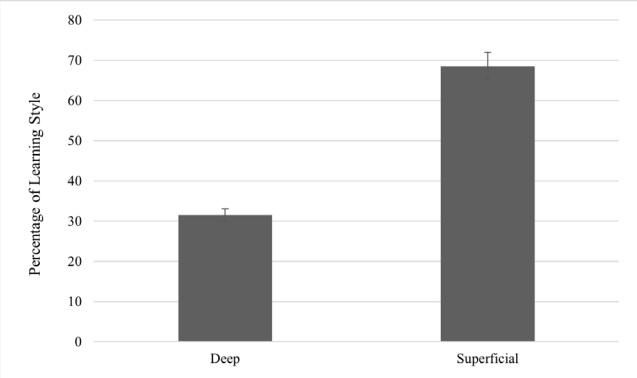


**Fig.1 Comparison of learning style percentage between deep learners and superficial learners among first-year medical students.**

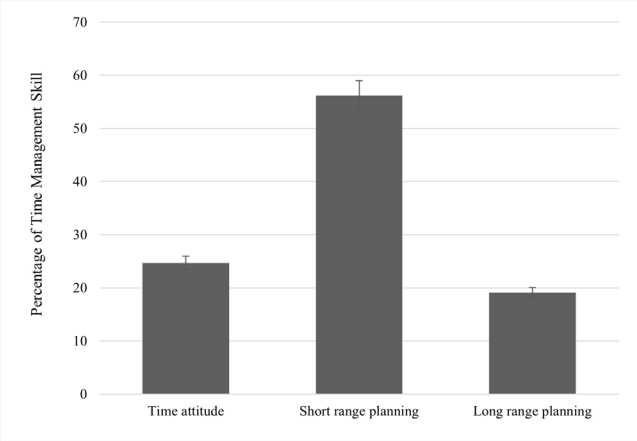


**Fig.2 Comparison of time management skill percentage for time attitude, short-range planning and long-range planning among first-year medical students.**

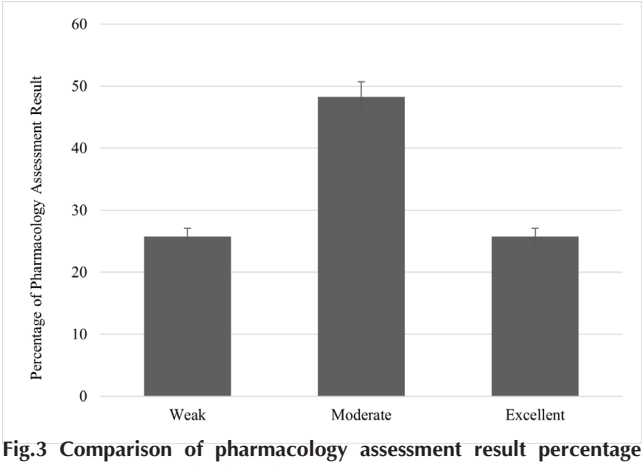


**Fig.3 Comparison of pharmacology assessment result percentage among first-year medical students.**

### Association Between Learning Style and Pharmacology Assessment Results

Table I demonstrates the correlations between learning styles and pharmacology assessment results of the students. The findings revealed that there was no statistically significant finding among the deep learning type and pharmacology assessment results as the significant value is 0.564 which is more than a p-score of 0.05. Respondents who prefer an approach to deep learning styles do not significantly relate to an increase or decrease in the respondents' pharmacology assessment results. However, the superficial learning type demonstrated a significant value which was 0.010 which is less than a p-score of 0.05. Furthermore, there was a weak significant negative correlation between superficial learning style and pharmacology assessment results. A weak negative connection indicates that a shallow learning style is associated with poor pharmacology assessment outcomes. Students' pharmacology assessment performance will tend to decline when they employ the superficial approach learning style.

**Table I Association between Learning Style and Pharmacology Assessment Result**

| Variables | Pharmacology Assessment Result |
|---|---|
| **Deep Learning Style** | |
| Pearson correlation | 0.062 |
| Sig. (2-tailed) | 0.564 |
| **Superficial Learning Style** | |
| Pearson correlation | -0.272* |
| Sig. (2-tailed) | 0.010 |

*- significant at p<0.05

### Association Between Time Management Skills and Pharmacology Assessment Result

Table II presented the association between the time management skills which include time attitude, short- and long-range planning with the pharmacology assessment results of the students. The findings revealed that there was no significant association between

time attitude, short range planning and pharmacology assessment results of the respondents with the significant value, which was 0.150 and 0.957, respectively which was more than a p-score of 0.05.

However, Table II revealed a significant association between long range planning and pharmacology assessment results of the students at a value of 0.001 which is less than a p-score of 0.05. There was a low negative correlation between pharmacology assessment performance and long-range planning. Scoring of long-range planning in time management is inversely proportional to the pharmacology assessment performance in the study. To summarise, long-term planning does not ensure a better pharmacological assessment outcome.

**Table II: Association between Time Management Skills and Pharmacology Assessment Result**

| Variables | Pharmacology Assessment Result |
|---|---|
| **Time Attitude** | |
| Pearson correlation | -0.154 |
| Sig. (2-tailed) | 0.150 |
| **Short Range Planning** | |
| Pearson correlation | -0.006 |
| Sig. (2-tailed) | 0.957 |
| **Long Range Planning** | |
| Pearson correlation | -0.353* |
| Sig. (2-tailed) | 0.001 |

*- significant at p<0 .05

### Association Between Time Management Skills and Learning Style

Table III demonstrated the correlations between deep learning style and time attitude. The findings revealed that there was no statistically significant finding among these two variables as the significant value is 0.449 which is more than a p-score of 0.05. There was a negligible positive correlation between deep learning style and time attitude. Respondents who prefer an approach to deep learning styles do not significantly relate to an increase or decrease in the respondents' time attitude in their time management skills.

Table III also revealed the correlations between deep learning style and short- and long-range planning. The findings revealed that there was a statistically significant finding among these two variables as the significant value were 0.013 and 0.016, respectively which were less than a p-score of 0.05. There was a weak positive correlation between deep learning style and short- and long-range planning, respectively. Scoring of deep learning style was directly proportional to the short- and long-range planning in time management skills.

In addition, Table III revealed a statistically significant finding between superficial learning style with time attitude and long-range planning respectively as the significant value were 0.050 and 0.002, respectively which were less than a p-score of 0.05. However, the short-range planning did not show any significant association with the superficial learning style.

**Table III: Association between Time Management Skills and Learning Style**

| Variables | Learning Style | |
|---|---|---|
| **Time Attitude** | **Deep** | **Superficial** |
| Pearson correlation | 0.081 | 0.209* |
| Sig.(2-tailed) | 0.449 | 0.050 |
| **Short Range Planning** | | |
| Pearson correlation | 0.263* | 0.161 |
| Sig. (2-tailed) | 0.013 | 0.131 |
| **Long Range Planning** | | |
| Pearson correlation | 0.256* | 0.323* |
| Sig. (2-tailed) | 0.016 | 0.002 |

*- significant at p<0 .05

## DISCUSSION

### Association Between Learning Style and Pharmacology Assessment Performance

The preferred method of processing new information for effective learning is referred to as learning style (6,8,9,10,32). Instead than focusing on what students learn, learning style is about how they learn (33). Each person's learning process is unique; even in the same educational setting, not all students learn at the same level and in the same way (6,7,8,9,10,11,34). According to research, various people have varied learning styles, so it was impossible to create the best learning conditions for everyone using only one technique or approach (35). This may be due to the diverse origins, skills, weaknesses, interests, goals, degrees of motivation, and study methods of the students (37). Learning style preferences are influential in learning and academic achievement and may explain how students learn (9,40).

Our results revealed that the superficial learning style has a definite negative impact, whereas the positive impact of a deep learning style was shown to be minimal. The end results for superficial learning style revealed a weak but substantial negative association between superficial learning style and pharmacology assessment performance. This indicates that pupils who use a superficial learning method tends to do worse in exams. Similar to a previous study by Ebrahim et al., (2017), the researchers discovered that students who were involved in health sciences implementing a superficial learning style almost always end up with weaker academic performances. Considering such a huge amount of workload as a medical student, merely memorization was not the best solution in getting better scores in the examination (28).

End results revealed that there was no statistically significant link between deep learning style and

pharmacology assessment performance in terms of deep learning style. This finding is consistent with Kim et al., (2017) findings, which found no significant association between deep learning style and exam performance. The issue of gauging qualitative items while relying on a quantitative-based system raises the question of whether examination scores should be used to determine one's academic accomplishment. Although it appears that a deep learning style should result in higher results, Kim et al., (2017) noted that the lack of relationship could be explained by the difficulties in determining the students' learning styles (42) especially regarding the deep approach. A person's subjective views and awareness of their own self could explain their response to an ostensibly favourable item.

**Association Between Pharmacology Assessment Performance and Time Management Skills**

It has been determined that effective time management techniques have a "buffering" effect on stress and are a significant predictor of improved performance and decreased anxiety and stress in higher education (43). Our end results however revealed only a significant association between pharmacology assessment performances and long range planning while short range planning and time attitude are statistically insignificant towards pharmacology assessment outcome and the significant correlation on long range planning is noted to be low negative. Long-range planning's only statistically significant outcomes are of little discussion value.

To compare, these results are contrasting with the findings from several recent studies (29,44) in which both research concluded that a good time management is always associated with good exam performance. However, a case study by Olowookere et al., (2015) found a lack of significant association between time management skills and exam performance (45).

Many students struggle to coordinate their studies with their extracurricular activities, which results in time management issues, irregular sleep habits, and elevated stress levels (46). Students who are able to set realistic work goals for themselves and develop time management skills provide a framework for self-regulation of their approach, effort, persistence, and time management (43). A study indicated that students with higher academic status took fewer and shorter breaks, suggesting a relationship between academic achievement and the capacity to focus for long periods of time (47). While many studies have found that high levels of motivation help maintain focus and are likely to lead to success in general as well as specific success in student outcomes (48,49), they do not necessarily imply that there is a causal relationship (in either direction) between academic attainment and time management (43). These inconsistent findings may indicate that time management skill is not an exclusive determinant of any exam performance. Students may be influenced by other external factors such as procrastination and social media usage regardless of their time management skill. In other words, examination performance may be difficult to predict solely based on time management skill. In order for time management skills to be effective on examination achievement, various variables such as intelligent quotion, family education level, social and economic level, and social milieu may be required (44).

**Association Between Learning Style and Time Management Skills**

The results from the research revealed significant association on both types of learning style with their corresponding time management skills. A deep learning style noted to have a significant and positive association with both short- and long-range planning with similar Pearson's scoring. This indicated that students who used a deep learning method could organise their time in both short- and long-term planning. While a superficial learning style have a strong positive connection between time attitude and long-term planning, long-term planning has a higher Pearson's score than time attitude. In comparison to time attitude and short-range planning, students who used a superficial learning style were more likely to manage their time using long range planning.

These findings contradict those of an earlier study by Mariam et al., (2020), which found no link between learning style and time management (45). Bozabayindir (2019) support the findings of the previous study by claiming that students were unable to manage their time properly, despite the fact that they organise their time effectively, and they are prone to falling into time traps (46).

Even though both variables are noted to be statistically significant, the consistent positive correlation findings bring up further questions. The contradictions with the findings of previous studies (46,47) may explain why there is only a weak correlation between learning style and time management skills. Attitudes to time management are dependent on individual students (48) rather than a singular factor. Effective time management is stressed through motivation and goal orientation. According to the findings, internal factors (individual attitudes and expectations) have a bigger impact on students' time management than extrinsic elements such as learning style (49). Time management has an impact on students' performance and accomplishments in addition to their mental talents and the potential to raise their stress levels. Thus, personalised learning styles should be created to help students build their own abilities, coordinate their learning activities throughout the semesters and during exam periods, and educate them how to structure their weekly learning activities (50).

## LIMITATION

Causation and effect cannot be determined because this is a cross-sectional study. The study's timing is not guaranteed to be representative. The findings' strength and generalisability are restricted by the fact that they were limited to a small group of medical students who do not reflect the full medical student body at Universiti Putra Malaysia. Furthermore, the pharmacology evaluation result is insufficient and does not reflect the medical students' overall academic performance. Future research involving the results of medical students across the entire medical curriculum subject could be conducted to better reflect the academic performance as a whole.

## CONCLUSION

This study has demonstrated that only a certain type of learning style serves as a factor in determining pharmacology assessment performance. Superficial learning style is noted to be an inefficient approach for medical students, providing an outcome of lower pharmacology assesment performance. Similarly, this study has revealed that pharmacology assessment performance may not be significantly influenced by an individual's time management skill. Their learning style and time management skills required further studies in a different point of view. It should be emphasized that the respondents are undergoing a fully online study course as this study is done within the period of Movement Control Order due to the occurrence of the COVID-19 pandemic. Therefore, the respondents' learning style and time management may be interrupted due to their unfamiliarity with online learning. The end results' variability in the process of learning and teaching might be of its significance of this study.

## ACKNOWLEDGEMENTS

We'd like to thank the FMHS (UPM) students who took part in the research, especially Tay Shun Shuen, Bavathaarini Maran, and Aqeelah Iman Rosly. The Dean's support for this project is likewise appreciated.

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