Effect of Time-Management on the Academic Performance of Medical Students, Benha University: A Cross-Sectional Study

Mai Abdullah Elmahdy*, Mai Magdy Anwer
Departments of Public Health, Community, Environmental and
Occupational Medicine, Faculty of Medicine, Benha University, Egypt
*Corresponding author: Mai Abdullah Elmahdy, **Mobile:** (+20) 01201882742, **E-mail:** may.yousf@bu.edu.eg

ABSTRACT
Background: Time management skills are thought to enhance positive students' academic output.
Objective: The aim of the study is to find the impact of time management on the academic performance of students of Faculty of Medicine, Benha University.
Methods: A cross-sectional study was conducted among undergraduate medical students through using online questionnaire of 22 questions, which was prepared on the basis of time self-management, awareness, management, preferences, and performance domains and the question were valued by 5 levels Likert Scale. A stratified random sample technique was used and data were analyzed by the Pearson chi-square test to find association between the time management and grade point average (GPA) achieved.
Results: 60.8% of participants strongly agreed (17.1%) or agreed (43.7%) that their academic performance was degraded due to poor planning, 61.6% of the studied group strongly agreed (20.3%) or agreed (41.3%) that they prefer to manage their time daily and 45.1% of the studied group strongly agreed (21.8%) or agreed (23.3%) that they often tend to postpone their tasks, 44.9% of the studied group strongly agreed (21.2%) or agreed (23.7%) that they priorities between various competing tasks, whereas 39%, 42.2%, 40.3% didn't have a clearly defined plan for each week's, month's and year's tasks respectively and the majority of them (80.7%) declared that their time management skill needs more improvement
Conclusions: To improve academic achievements, academic advisors, seminars and workshops, counselors and psychologists can assist students to improve their time management skills.
Keywords: Time management, Academic achievement, University students.

INTRODUCTION

Effective and efficient management of time was greatly emphasized through history and was thought to be essential for success [1]. Decreasing time waste and unproductive work through the concept of using of time management for examining employees' time and motion studies have been established. Performing time management practices in early student life has been advised. Self-management with a special focus on time in detecting what activities to be done; how to be done more efficiently; in what time it should be done and what is the correct time for the specific activity to be done was defined as time management [2].

Time management "behavior" was defined to do goal directed activities on the basis of efficient use of time. Time attitudes, long-range planning and short-range planning were three main corners of time management behavior [3]. Time attitude, defined as one's positive or negative viewpoint on the past, present, and future, and it has been found to be positively correlated with academic success, particularly in the scientific disciplines [4].

On the other hand, long-term planning was described as carrying out routine tasks over extended periods of time while maintaining the goals established for important dates. While, preparing daily or weekly tasks (day to day activity) was called short-range planning. Regarding students, their curricula can be managed and learning goals can be achieved through enhancing their time management skills and improving their academic results [5].

Relation between higher academic attainment and efficient time management has been established by many previous studies [6]. Educational achievement was effectively predicted by student time management perspective where incorrect time management skills was associated with poor students' planning for their studies and produced stress and worry during the evaluation period, particularly near the end of the course [7].

Moreover, prioritization of tasks was reported to improve work and studying and reduce inefficiencies, anxiety and stress [8]. Whereas, better time management skills were established to reduce students' anxiety and tension while increasing their output and academic performance [9]. Therefore, learning time management skills is essential since while some people are excellent at it, others are not. Good time management behaviors to be successful not only in student life but also later in life have to be assured. Time management, as declared by **Claessens et al.** [10], could be achieved through execution, capacity, and drive for oneself. Time management abilities have been linked to improved academic performance, according to several research. Despite being aware of how time management affects academic performance, students did not place enough emphasis on this relationship [11].

Thus, the study's goal is to determine how time management affects medical students' academic achievement at Benha University (BU). The study objectives also include to assess time management behaviors, self-motivation, planning and prioritization

of medical students, and evaluate academic performance of the students. This research will provide knowledge and recommendations for raising awareness and gaining skills of perfect personal strategic planning.

RESEARCH QUESTIONS
- Q1: How are the time management skills of the medical students?
- Q2: Is there a difference between medical students' academic performance based on their time management abilities?
- Q3: What are the predictors for students' academic achievement (GPA)?

METHODS
Study design, setting and participants:
A cross-sectional based survey study was conducted on students of Faculty of Medicine at Benha University (BU). The study duration was two months from June 2023 to Aug 2023. Only the undergraduate students were included in the study. Post-graduate students, students who had officially graduated, intern and undergraduate students of first academic year (No previous recorded GPA) were excluded. Samples were stratified by their academic year (i.e., each educational year was considered stratum except first educational year was excluded). Participated students were allocated to the study randomly on submitting online questionnaire.

The sample size was calculated using EPI-Info (Epidemiological information package) software version 6.1, with C.I (Confidence Interval) of 95% and power of 80%.

$$\text{Sample size} = \frac{Z2 * (P) * (1 - P)}{d2}$$

Where:
Z = Z value (e.g., 1.96 for 95% confidence level)
P = percentage picking a choice, 50% prevalence of time management practices, expressed as decimal (0.5 used for sample size needed) [12].
d = expected margin of error (0.05).
The Minimal recommended sample size was 384.
All enrolled undergraduate students were invited to participate in the research. A total of 747 students responded by providing informed consent and completing the survey.

Data collection tool:
A structured, anonymous and self-administered (Google form) time management questionnaire was used [13]. The questionnaire had 22 questions on Likert 5-point scale consisting of the responses: Strongly disagree (5), Disagree (4), Neutral (3), Agree (2), Strongly agree (1). The questionnaire consisted of eight domains: student perspectives (preplanning approaches, poor planning related academic performance and involvement in extracurricular activities), positive attitude (daily time management, meeting deadline and managing workload), negative attitude (regarding delay tasks), positive contributing factors (managing tension on managing duties, having plenty of time to complete tasks, understanding whole lectures), negative contributing factors (challenging with time online learning and sleeping pattern), short term time management (defined plan for week/month task), long term time management (defined plan for quarter/year task) and techniques for time management (self-assessment and to-do list program). The last question was to evaluate academic achievement using (GPA in the last year) as reported by medical students. Research specialists provided feedback, and modifications were made prior to adoption. Additionally, before distributing it to the wider population, an internal pilot study involving 20 students was conducted.

Ethical approval:
Approved of the Research Ethics Committee of the Faculty of Medicine, Benha University was obtained (code RC: 14-5-2023). Informed consent was taken from each participant after explaining the study design and its aim. The survey was anonymous, and information confidentiality was guaranteed. The Helsinki Declaration was followed throughout the study's conduct.

Statistical analysis
The SPSS software package, version 26, was used to analyze the data. Data were expressed as frequencies (n) and percentage (%). The relation between time management and the obtained GPA was investigated using the Pearson chi-square test. Multivariate linear regression analysis was performed for detection of predictors for academic performance (GPA) of medical students, after adjusting for confounders, including age, sex, residence, academic year, nationality, student perception, positive attitude, negative attitude, short-term and long-term time management and practice for time management. The alpha coefficient was 0.05 and P-value ≤ 0.05 was considered significant.

RESULTS
Among 747 participants, more than one half (50.6%) of the studied students were >21 years old, 63.1% were females, 30.5% were in the 3rd academic year, the majority (94.4%) were Egyptians and 29.7% had GPA score between 4-4.4 and 27.7% had a GPA score between 4.5- 5 in their last academic year **(Table 1).**

Table (1): Basic and demographic characteristics of the studied students

Characteristics (N=747)		No.	%
Age (years)	≤21	369	49.4
	>21	378	50.6
Sex	Female	471	63.1
	Male	276	36.9
Residence	Rural	339	45.4
	Student hostel	63	8.4
	Urban	345	46.2
Academic year	2nd (5+2)	130	17.4
	3rd (5+2)	228	30.5
	4th (5+2)	189	25.3
	5th (5+2)	36	4.8
	5th (6+1)	106	14.2
	6th (6+1)	58	7.8
Nationality	Egyptian	705	94.4
	Non-Egyptian	42	5.6
GPA	less than (2.5)	66	8.8
	2.5 - 3.4	72	9.6
	3.5 - 3.9	180	24.1
	(4.0 - 4.4)	222	29.8
	(4.5 - 5)	207	27.7

Table 2 represents the frequency of the answers given by the participants for each question related to time management. Regarding student perception about time management, more than half (55.9%) of the studied medical students disagreed or strongly disagreed that preplanning methods are inefficient, while 60.8% of participants agreed or strongly agreed that their academic performance was degraded due to misplanning. Regarding their attitudes towards time management 61.6% of the studied group agreed or strongly agreed that they prefer to manage their time daily and 44.9% of the studied group agreed or strongly agreed that they priorities between various competing tasks, while 45.1% of the medical students reported that they often tend to delay their tasks. On studying factors impacting time management, nearly 40% agreed or strongly agreed that online learning has affected their time and that they can manage stress when handling multiple conflicting duties. Whereas regarding planning for time management, 39%, 42.2%, 40.3% didn't have a clear established plan for each week's, month's and year's tasks respectively and the majority of them (80.7%) declared that their time management skill needs more improvement **(Table 2).**

Table (2): Frequency distribution of medical students' responses regarding time management on Likert scale:

QUESTIONS (N=747)	No. (%)				
	1	**2**	**3**	**4**	**5**
STUDENT PERSPECTIVES					
The approaches I use for preplanning are ineffective and have no impact on academic achievement	51(6.8)	96(12.8)	183(24.5)	282(37.8)	135(18.1)
My academic performance has suffered as a result of poor planning	129(17.3)	330(44.2)	144(19.3)	105(14.1)	39(5.2)
My involvement in extracurricular activities won't have an impact on my grades	42(5.6)	225(29.8)	237(31.7)	159(21.5)	84(11.4)
POSITIVE ATTITUDE					
I like to schedule my time each day	153(20.8)	312(41.5)	165(21.9)	81(10.9)	36(4.9)
I meet the deadline for any work	60(7.9)	228(30.2)	300(39.7)	123(16.7)	36(5.5)
I effectively manage workload	21(2.8)	219(29.0)	306(40.7)	162(21.7)	39(5.8)
I am able to adjust to changes, remain flexible, reevaluate my priorities, and yet deliver high-quality work	112(15.0)	153(20.5)	215(28.8)	143(19.1)	124(16.6)
I strike a balance between my personal and academic time	122(16.3)	140(18.7)	171(22.9)	159(21.3)	155(20.8)
I priorities between various competing tasks	158(21.2)	177(23.7)	175(23.4)	126(16.9)	111(14.8)
NEGATIVE ATTITUDE					
I frequently have a tendency to put off or delay finishing duties	163(21.8)	174(23.3)	155(20.7)	133(17.8)	122(16.4)
NEGATIVE CONTRIBUTING FACTORS					
I find it difficult, and it interferes with my time for online learning	138 (18.5)	161(21.6)	144(19.3)	159(21.3)	145(19.3)
I feel unmotivated to study and sluggish because of insufficient sleeping-pattern	159(21.3)	138(18.5)	147(19.7)	157(21.0)	146(19.5)
POSITIVE CONTRIBUTING FACTORS					
I manage tension on managing multiple conflicting duties	148(19.8)	160(21.4)	147(19.7)	140(18.7)	152(20.4)
I have plenty of time to finish my tasks during the day	134(17.9)	162(21.7)	158(21.2)	146(19.5)	147(19.7)
I usually understand the whole lectures	161(21.7)	161(21.7)	149(19.9)	139(18.6)	137(18.1)
SHORT TERM TIME MANAGEMENT					
I have a clearly defined plan for each week's activities	148(19.8)	161(21.6)	146(19.5)	143(19.2)	149(19.9)
I have a clearly defined plan for each month's activities	145(19.4)	141(18.9)	146(19.5)	164(22.0)	151(20.5)
LONG TERM TIME MANAGEMENT					
I have a list of objectives for the entire quarter/semester	136(18.2)	154(20.6)	152(20.3)	152(20.3)	153(20.6)
I have a clearly defined plan for each year's activities	137(18.3)	155(20.7)	154(20.6)	159(21.4)	142(19.0)
TECHNIQUES FOR TIME MANAGEMENT					
I feel that my time management skill needs more improvement (self-assessment)	267(35.8)	342(45.7)	72(9.6)	45(6.0)	21(2.9)
I used to mark my significant dates on one calendar (To-do-list program etc.)	153(20.5)	155(20.7)	127(17.0)	152(20.3)	160(21.5)
I am wise with my time and stay focused	152(20.3)	141(18.9)	161(21.6)	159(21.3)	134(17.9)

1= Strongly agree, 2= Agree, 3= Neutral, 4=Disagree, 5= Strongly disagree

There was highly statistical significant difference between students with different GPA scores in their last academic year regarding perception about impact of time planning and participation in extracurricular activities on their academic performance where 42% of the medical students with GPA scores between 4.5-5 disagreed that preplanning methods are inefficient and don't affect academic performance, 45.5% of the participants with GPA scores <2.5 agreed that their academic performance is degraded due to misplanning while 37.8% of the studied group whose GPA scores between 4-4.4 strongly agreed or agreed that their participation in extracurricular activities won't affect their academic performance (Table 3).

Table (3): Relationship between medical students' perception and GPA

QUESTIONS (N=747)		GPA					X^2	P
		<2.5	2.5-3.4	3.5-3.9	4-4.4	4.5-5		
STUDENT PERCEPTION								
The approaches I use for preplanning are ineffective and have no impact on academic achievement	1	3(4.5)	9(12.5)	12(6.70)	18(8.1)	9(4.5)	72.12	<0.001 HS
	2	24(36.4)	9(12.5)	15(8.3)	33(14.9)	15(7.2)		
	3	18(27.3)	18(25.0)	45(25.0)	39(17.6)	63(30.4)		
	4	21(31.8)	18(25.0)	72(40.0)	84(37.8)	87(42.0)		
	5	0(0.0)	18(25.0)	36(20.0)	48(21.6)	33(15.9)		
My academic performance has suffered as a result of poor planning	1	24(36.4)	33(45.8)	24(13.4)	15(6.7)	33(15.9)	95.93	<0.001 HS
	2	30(45.5)	9(12.5)	81(45.0)	117(52.7)	93(44.9)		
	3	6(9.1)	18(25.0)	45(25.0)	45(20.3)	30(14.6)		
	4	3(4.5)	9(12.5)	15(8.3)	36(16.2)	42(20.3)		
	5	3(4.5)	3(4.2)	15(8.3)	9(4.1)	9(4.3)		
My involvement in extracurricular activities won't have an impact on my grades	1	0(0.0)	6(8.4)	12(6.7)	18(8.1)	6(2.9)	84.15	<0.001 HS
	2	9(13.6)	24(33.3)	54(30.0)	66(29.7)	72(34.8)		
	3	15(22.7)	24(33.3)	57(31.6)	69(31.1)	72(34.8)		
	4	24(36.4)	0(0.0)	39(21.7)	45(20.3)	51(24.6)		
	5	18(27.3)	18(25.0)	18(10.0)	24(10.8)	6(2.9)		

1= Strongly agree, 2= Agree, 3= Neutral, 4=Disagree, 5= Strongly disagree, HS= Highly significant

On studying relationship between medical students' positive attitude towards time management and their GPA scores, there were highly statistical significant differences between students with different GPA scores in their preference to daily time management, meeting work deadline, and effectiveness of work load management where 72.5% of the studied students whose GPA scores from 4.5-5 claimed that they prefer to manage their daily time, 44.6% of the medical students with GPA scores from 4-4.4 declared that they can meet their work deadline and 40.9% of the participants whose GPA scores <2.5 found that they can't effectively manage workload, while there are no statistical significant differences between students with different GPA scores in their negative attitude and development of short and long term time management plans. **(Table 4)**.

Table (4): Relationship between medical students' behavior for time management and GPA

QUESTIONS (N=747)			GPA					X^2	P
			<2.5	2.5-3.4	3.5-3.9	4-4.4	4.5-5		
POSITIVE ATTITUDE	I prefer to manage my time daily	1	6(9.1)	21(29.2)	39(21.6)	45(20.3)	42(20.3)	54.16	<0.001 HS
		2	39(59.2)	30(41.7)	57(31.7)	78(35.1)	108(52.2)		
		3	9(13.6)	6(8.3)	57(31.7)	54(24.3)	39(18.8)		
		4	9(13.6)	9(12.5)	21(11.7)	30(13.5)	12(5.8)		
		5	3(4.5)	6(8.3)	6(3.3)	15(6.8)	6(2.9)		
	I meet the deadline for any work	1	6(9.1)	3(4.2)	9(5.0)	12(5.4)	30(14.5)	68.68	<0.001 HS
		2	21(31.8)	21(29.2)	39(21.7)	87(39.2)	60(29.0)		
		3	18(27.3)	24(33.3)	90(50.0)	78(35.1)	90(43.5)		
		4	12(18.2)	18(25.0)	36(20.0)	30(13.5)	27(13.0)		
		5	9(13.6)	6(8.3)	6(3.3)	15(6.8)	0(0.0)		
	I effectively manage workload	1	6(9.1)	3(4.2)	3(1.7)	3(1.4)	6(2.9)	65.87	<0.001 HS
		2	15(22.7)	15(20.8)	48(26.7)	75(33.8)	66(31.9)		
		3	18(27.3)	24(33.3)	69(38.3)	90(40.5)	105(50.7)		
		4	18(27.3)	21(29.2)	51(28.3)	42(18.9)	30(14.5)		
		5	9(13.6)	9(12.5)	9(5.0)	12(5.4)	0(0.0)		
	I am able to adjust to changes, remain flexible, reevaluate my priorities, and yet deliver high-quality work	1	9(13.6)	8(11.1)	18(10)	41(18.5)	36(17.3)	24.35	0.08
		2	12(18.2)	12(16.7)	29(16.1)	45(20.3)	55(26.6)		
		3	16(24.2)	26(36.1)	67(37.2)	56(25.2)	50(24.2)		
		4	15(22.7)	16(22.2)	35(19.4)	41(18.5)	36(17.4)		
		5	14(21.3)	10(13.9)	31(17.3)	39(17.5)	30(14.5)		
	I strike a balance between my personal and academic time	1	10(15.3)	13(18.1)	24(13.3)	36(16.2)	39(18.8)	23.02	0.11
		2	12(18.2)	14(19.4)	26(14.4)	38(17.1)	50(24.2)		
		3	10(15.2)	15(20.8)	42(23.3)	56(25.2)	48(23.2)		
		4	13(19.7)	12(16.7)	51(28.3)	45(20.3)	38(18.4)		
		5	21(31.6)	18(25.0)	37(20.7)	47(21.2)	32(15.4)		
	I priorities between various competing tasks	1	12(18.2)	14(19.4)	41(22.8)	53(23.9)	38(18.4)	21.36	0.16
		2	13(19.7)	17(23.6)	38(21.1)	55(24.8)	54(26.1)		
		3	18(27.3)	12(16.7)	46(25.6)	45(20.3)	54(26.1)		
		4	10(15.2)	21(29.2)	32(17.8)	39(17.6)	24(11.6)		
		5	13(19.6)	8(11.1)	23(12.7)	30(13.4)	37(17.8)		
NEGATIVE ATTITUDE	I frequently have a tendency to put off or delay finishing duties	1	15(22.7)	21(29.2)	45(25.0)	48(21.6)	34(16.3)	17.42	0.35
		2	15(22.7)	13(18.1)	49(27.2)	53(23.9)	44(21.3)		
		3	11(16.7)	16(22.2)	27(15.0)	52(23.4)	49(23.7)		
		4	13(19.7)	10(13.9)	35(19.5)	33(14.9)	42(20.3)		
		5	12(18.2)	12(16.6)	24(13.3)	36(16.2)	38(18.4)		
SHORT TERM TIME MANAGEMENT	I have a clearly defined plan for each week's activities	1	11(16.7)	14(19.4)	40(22.2)	37(16.7)	46(22.2)	16.26	0.43
		2	17(25.7)	13(18.1)	27(15.0)	58(26.1)	46(22.2)		
		3	13(19.7)	12(16.7)	36(20.0)	40(18.0)	45(21.8)		
		4	12(18.2)	14(19.4)	43(23.9)	39(17.6)	35(16.9)		
		5	13(19.7)	19(26.4)	34(18.9)	48(21.6)	35(16.9)		
	I have a clearly defined plan for each month's activities.	1	13(19.7)	10(13.8)	43(23.9)	35(15.7)	44(21.3)	14.65	0.55
		2	15(22.7)	12(16.7)	30(16.7)	42(18.9)	42(20.3)		
		3	12(18.2)	13(18.1)	27(15.0)	55(24.8)	39(18.8)		
		4	13(19.7)	17(23.6)	42(23.3)	49(22.1)	43(20.8)		
		5	13(19.7)	20(27.8)	38(21.1)	41(18.5)	39(18.8)		
LONG TERM TIME MANAGEMENT	I have a list of objectives for the entire quarter/semester	1	10(15.2)	8(11.1)	34(18.9)	39(17.5)	45(21.7)	21.75	0.15
		2	11(16.7)	10(13.9)	35(19.4)	47(21.2)	51(24.6)		
		3	12(18.2)	13(18.1)	40(22.2)	49(22.1)	38(18.4)		
		4	15(22.6)	17(23.6)	39(21.7)	49(22.1)	32(15.5)		
		5	18(27.3)	24(33.3)	32(17.8)	38(17.1)	41(19.8)		
	I have a clearly defined plan for each year's activities	1	13(19.7)	13(18.1)	35(19.4)	38(17.1)	38(18.4)	20.29	0.2
		2	14(21.2)	14(19.4)	31(17.2)	43(19.4)	53(25.6)		
		3	12(18.2)	12(16.7)	36(20.0)	48(21.6)	46(22.2)		
		4	15(22.7)	9(12.5)	45(25.0)	54(24.3)	36(17.4)		
		5	12(18.2)	24(33.3)	33(18.4)	39(17.6)	34(16.4)		

1= Strongly agree, 2= Agree, 3= Neutral, 4=Disagree, 5= Strongly disagree, HS= Highly significant

On exploring the relationship between different time management factors and students' GPA, there was a highly statistical significant difference among students with different GPA scores regarding their perception towards the need to improve their time management skills where 84% of the medical students whose GPA scores between 4.5-5 felt that their time management skills need improvement and on examining students who prepare to-do lists, there was a statistical significant difference among students with different GPA scores where 46.9% of the studied students whose GPA scores between 4.5-5 claimed that they used to put their important dates on a calendar.

Table (5): Relationship between different time management factors among medical students and GPA

QUESTIONS (N=747)		GPA					X^2	P
		<2.5	2.5-3.4	3.5-3.9	4-4.4	4.5-5		
FACTORS WITH NEGATIVE IMPACT								
I find it difficult, and it interferes with my time for online learning	1	14(21.2)	19(26.7)	27(15.0)	40(18.7)	38(18.4)	17.05	0.38
	2	17(25.8)	12(16.4)	40(22.2)	46(20.7)	46(22.2)		
	3	8(12.1)	9(12.5)	34(18.9)	57(25.7)	36(17.4)		
	4	15(22.7)	17(23.6)	38(21.1)	42(18.2)	47(22.7)		
	5	12(18.2)	15(20.8)	41(22.8)	37(16.7)	40(19.3)		
I feel unmotivated to study and sluggish because of insufficient sleeping-pattern	1	17(25.8)	22(30.6)	41(22.8)	40(18.0)	39(18.8)	25.85	0.05
	2	16(24.2)	11(15.3)	30(16.7)	40(18.0)	41(19.8)		
	3	17(25.8)	12(16.7)	30(16.7)	49(22.1)	39(18.8)		
	4	8(12.1)	9(12.4)	50(27.8)	42(18.9)	48(23.2)		
	5	8(12.1)	18(25.0)	29(16.0)	51(23.0)	40(19.4)		
FACTORS WITH POSITIVE IMPACT								
I manage tension on managing multiple conflicting duties	1	14(21.2)	15(20.8)	35(19.4)	46(20.7)	38(18.4)	24.07	0.08
	2	10(15.2)	11(15.3)	43(23.9)	45(20.3)	51(24.6)		
	3	10(15.2)	17(23.6)	33(18.3)	47(21.2)	40(19.3)		
	4	11(16.6)	12(16.7)	23(12.8)	51(23.0)	43(20.8)		
	5	21(31.8)	17(23.6)	46(25.6)	33(14.8)	35(16.9)		
I have plenty of time to finish my tasks during the day	1	9(13.6)	13(18.1)	29(16.1)	41(18.5)	42(20.3)	24.19	0.08
	2	15(22.7)	15(20.8)	36(20.0)	39(17.6)	57(27.5)		
	3	7(10.6)	18(25.0)	45(25.0)	50(22.5)	38(18.4)		
	4	16(24.2)	8(11.1)	38(21.1)	44(19.8)	40(19.3)		
	5	19(28.9)	18(25.0)	32(17.8)	48(21.6)	30(14.5)		
I usually understand the whole lectures	1	15(22.7)	11(15.3)	37(20.6)	47(21.2)	51(24.7)	26.29	0.05
	2	11(16.7)	12(16.7)	30(16.7)	45(20.3)	63(30.4)		
	3	14(21.2)	16(22.2)	44(24.4)	47(21.2)	28(13.5)		
	4	11(16.7)	16(22.2)	38(21.1)	38(17.0)	36(17.4)		
	5	15(22.7)	17(23.6)	31(17.2)	45(20.3)	29(14.0)		
PRACTICES FOR TIME MANAGEMENT								
I feel that my time management skill needs more improvement (self-assessment)	1	21(31.8)	42(58.3)	72(40.0)	63(28.4)	69(33.3)	38.17	<0.001 HS
	2	39(59.2)	21(29.2)	75(41.7)	102(45.8)	105(50.7)		
	3	3(4.5)	9(12.5)	9(5.0)	27(12.2)	24(11.6)		
	4	3(4.5)	0(0.0)	18(10.0)	15(6.8)	9(4.4)		
	5	0(0.0)	0(0.0)	6(3.3)	15(6.8)	0(0.0)		
I used to mark my significant dates on one calendar (To-do-list program etc.)	1	10(15.2)	18(25.0)	30(16.7)	47(21.2)	48(23.2)	30.32	0.01 S
	2	11(16.7)	12(16.7)	32(17.8)	51(23.0)	49(23.7)		
	3	4(6.1)	10(13.9)	33(18.3)	37(16.6)	43(20.7)		
	4	16(24.2)	15(20.8)	41(22.8)	42(18.9)	38(18.4)		
	5	25(37.8)	17(23.6)	44(24.4)	45(20.3)	29(14.0)		
I am wise with my time and stay focused	1	12(18.2)	12(16.7)	31(17.2)	49(22.1)	48(23.2)	25.25	0.06
	2	10(15.2)	12(16.7)	21(11.7)	51(23.0)	47(22.7)		
	3	12(18.2)	17(23.6)	42(23.3)	43(19.3)	47(22.7)		
	4	16(24.2)	13(18.0)	47(26.1)	46(20.7)	37(17.9)		
	5	16(24.2)	18(25.0)	39(21.7)	33(14.9)	28(13.5)		

1= Strongly agree, 2= Agree, 3= Neutral, 4=Disagree, 5= Strongly disagree, S= Significant, HS= Highly significant

Academic year and perception towards time planning impact were highly significant predictors of students' GPA, where higher academic year (β= 0.365) and lower negative perception regarding pre preplanning impact (β= -0.136) among the medical students were significant independent predictors for greater GPA scores.

GPA scores of the medical students was significantly predicted by time misplanning, calendar use and sleeping pattern, where lower misplanning (β= -0.128), increased calendar use (β=0.109) and lower insufficient sleeping-pattern (β= -0.088) among the medical students were significant independent predictors for greater GPA scores.

Finally, participation in extracurricular activities, meeting work deadline and students' flexibility and adaptation to change were significant predictors for the medical students' GPA scores where lower negative attitude towards impact of participation in extracurricular activities (β=-0.107), increased meeting deadlines (β= 0.093) and higher flexibility when changes occur (β=0.079) among the medical students were significant independent predictors for greater GPA scores (**Table 6**).

Table (6): Multiple linear regression for the predictors of GPA of the studied students

Predictors (N=747)	GPA β	T	P
Age (years)	0.101	2.74	0.006 S
Academic year	0.365	9.53	<0.001 HS
My academic performance has suffered as a result of poor planning	-0.128	3.47	0.001 S
The approaches I use for preplanning are ineffective and have no impact on academic achievement	-0.136	4.10	<0.001 HS
I used to mark my significant dates on one calendar (To-do-list program etc.)	0.109	3.30	0.001 S
I feel unmotivated to study and sluggish because of insufficient sleeping-pattern	-0.088	2.68	0.007 S
My involvement in extracurricular activities won't have an impact on my grades	-0.107	3.06	0.002 S
I meet the deadline for any work	0.093	2.63	0.009 S
I am able to adjust to changes, remain flexible, reevaluate my priorities, and yet deliver high-quality work	0.079	2.39	0.01 S

β= Regression coefficient, P = Probability, S = Significant, HS= Highly significant

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DISCUSSION

The purpose of this study was to determine how time management affected academic achievement of Benha Faculty of Medicine medical students. The majority of the respondents were Egyptian and females responded more than males. While more than one half of the studied students perceived that the preplanning methods were efficient and can impact their academic performance, which can be degraded due to misplanning, about 40% of them didn't have short nor long term time management plan, which could be due to multiple reasons.

In this study 35.4 % of the students perceived that participation in extracurricular activities didn't affect their academic performance like **Johnston** [14] who found that academic activity is also actively pursued by students who participate in extracurricular activities such as sports, clubs, and even academic competitions. Regarding positive attitudes about time management, more than 60% of the participants preferred to manage their time daily while 38.1% and 31.8% of them could only respect the due date for any work and could effectively control workload respectively, 44.9% of the medical students found that they can priorities between various competing tasks. This was in consistence with **Picton** [15] who found that 27.2% could complete all of their daily tasks and 54.6% can do things in a priority sequence. In consistence with **Alyami** *et al.* [13] **and Rich** *et al.* [16] who found that the medical participants had suffered from work–life imbalance, this study revealed that 42.0% of the students couldn't balance between private time and study time.

However, this study revealed that 35.5% of the studied students found that they can evolve with the times and be adaptable while still producing great work, while **Dost et al.** [17] found that overall, students did not engage nor enjoy change, and they could not be as much efficient as in conventional times. This difference might be due to that such a study was conducted during the early emergence of COVID 19 when students were distracted by the panic of the new pandemic that could impacted their ability to adapt to new learning methods.

Unlike **Rabin et al.** [18] who found that the average procrastination, or the deliberate postponement of obligations, scores of studied college students were within the neutral range, the current study results showed that 45.1% of the studied students often tend to delay/postpone their tasks. This could be explained by crowded duties needed from students of the recently applied medical program (5+2) which forced some of them to do so.

There was neutral perception regarding online learning (nearly 40% both agreed and disagreed that online learning was challenging and affected their time), that was not supported by **Khalil et al.** [19] who found all medical participants acknowledged that online sessions saved them time and that doing so had enhanced their performance. The possible explanation may be that network accessibility may be not feasible to all students at the same level in Egypt, as a developing country, unlike Saudi Arabia

Like **Maheshwari and Shaukat** [20], poor sleep quality was witnessed among 64.24% of the academic students and impacted their GPA, this study showed that nearly 40% of the students felt sluggish and their study mood was affected due to lack sleep.

Moreover, 41.2% of the studied students perceived that they can manage stress when handling multiple conflicting duties and that was in agreement with **Saipanish** [21] study where about 35% of studied students assessed their own coping ability to stress at the 'very good and good' levels. In accordance to this study where 39.2% of students found that they don't have adequate time during the day to perform their tasks, **Hill et al.** [22] found that 29.2% of the studied medical students never have the feeling of being 'done' for the day, or even for the week and there is always more that needs to be done. Like **Javaeed** [23] who founded that time management is a needed course that should be included in the medical curriculum for undergraduate students; this study showed that more over 80% of the students felt they could need some improvement in their time management skills.

In addition, the results of this study were supported by **Adams and Blair** [24] findings at which among the variables that were substantially linked with cumulative grade point average (GPA) of engineering students was their perception of their ability to manage time, this study found that there was a statistically significant relationship between students' perception regarding time management and their GPA scores.

However, the current study findings revealed that high academic marks were also achieved by students with a good attitude who claimed to efficiently manage their workload, fulfill deadlines, and manage their daily time. This was against **Pehlivan** [25] who could not detect significant relation between GPA and the time attitudes among a group of financial accounting course students and **Nasrullah and Khan** [1] who found that correlation between academic achievement and time attitude didn't achieve the significance value and this may be due to smaller sample sizes that failed to detect significant relationship.

Moreover, this study showed insignificant relationship between how private time was spent and its impact on academic performance, which agreed with **Yashinta et al.** [26]. On the other hand, this study reported that there was insignificant statistical relationship between tendency of medical students to postpone their tasks and their GPA scores, which disagreed with **Hayat et al.** [27] where academic procrastination and academic success in medical students were significantly inversely correlated, this could be due to that procrastination might mediate other academic and motivational variables like influencing the individual's rational beliefs in studying, academic and life satisfaction and experiencing stress and anxiety.

In agreement with **Nasrullah and Khan** [1], this study failed to detect significant relationship between short- and long-term time management and the GPA score, but this was contrast to **Ganguly et al.** [28] study where time management practices including short- and long-term planning impacted Indian students' academic achievement and this may be due to better planning methods used by students of such a study.

Furthermore, on studying the relationship between time management factors with negative impact among medical students and their GPA scores, this study showed insignificant relationship between students' attitude towards the effect of online learning on time and their GPA scores and this was consistent with **Daryazadeh et al.** [29] study at which academic achievement and students' attitudes toward online learning did not significantly correlate. In contrast to **Lawson et al.** [30], this study showed insignificant relationship between sleeping pattern of medical students and their GPA score and this might be due to different sleeping habits experienced by the Egyptians especially youth who prefer to stay up and mange life late.

In contrast, during studying time management factors with positive impact, this study showed insignificant statistical relationship between stress management in medical students and their academic performance, which didn't match with **Al-Shahrani et al.** [31] findings at which King Khalid University's medical students have demonstrated a link between increased stress and poorer GPA levels, and this was

because that this study examined only one mediator of stress, which was handling multiple duties and neglected other sources that could impact the academic achievement. Additionally, this study's findings showed that there was statistical significant relationship between students' organization of important dates and their perception towards the need to improve time management skills with their GPA scores. This was confirmed by **McCloskey** [32] who concluded that teachers should take into account time management skills like self-control and self-efficacy when evaluating student work since these skills have been linked to improved performance on standardized tests and college course examinations.

Moreover, regarding different predictors for students' academic performance, age was a significant predictor of students' academic achievement which was consistent with a study conducted by **Tadese** *et al.* [33] among university students in Ethiopia, and surprisingly, this study showed that students' academic year was a highly significant predictor for their academic performance, meanwhile **Al-Mazrou** [34] found that a good indicator of a student's achievement in later years is their premedical year's GPA, while **Agahi** *et al.* [35] found that traditional academic performance indicators, such as undergraduate GPA, have a weak to moderate correlation with grades and success in medical school, further research is recommended to explore this area.

Finally, students' perception regarding preplanning methods was a highly significant predictor of their academic performance which agreed with **Scherer** *et al.* [7] where lack of time management skills resulted in difficulty in planning studies which led to students' anxiety and agitation at the assessments and impacted the academic performance.

CONCLUSION

According to this research, although the majority of the participated students had a positive perception and attitude towards time planning importance and its impact on academic achievement, only about 40% of them practiced constructive time management behaviors like short- and long-time management plans, using to do lists and calendars and spending times wisely without distractions and more than 80% felt that their time management abilities need some improvement. Academic advisors should act as mentors to boost students' engagement in such practices. Organizing interesting seminars and workshops can assist students to improve their time management abilities. Counselors and psychologists can provide time management therapy sessions to the defaulters how find this hard to be applied.

LIMITATIONS

Like other research, the current one has limitations in terms of its design. Cross sectional studies cannot be used to analyze behavior over a period of time and as the questionnaire was conducted online, some students might respond haphazardly to some questions, which affected the accuracy of results. Further research through prospective observational studies, which follow students over time, is suggested as it can investigate deeper into the reasons and provide better recommendations to overcome time misplanning impact on academic achievement.

Conflict of interest: We have no conflict of interest.

Authors contributions:
The manuscript has been read and approved by all the authors, that the requirements for authorship have been met, and that each author has substantial contributions to each of the three components mentioned below:
- The idea and plan of the research, the collection, analysis, and interpretation of the data;
- Editing the article or closely revising it for significant intellectual content
- Final approval of the published version.

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