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# Magnitude of academic performance and its associated factors among health science students at Eastern Ethiopia University's 2022

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## Abstract

**Background** Academic performance is the extent to which a student, teacher, or institution has attained their short- or long-term educational goals and is measured either by continuous assessment or cumulative grade point average (CGPA). Good academic performance is defined as the students who scored a cumulative GPA of 3 and above. Even though few studies were done in Ethiopia, there was no clear evidence regarding the role of cognitive and learning issues such as academic competence, test competence, time management, strategic studying, and test anxiety on the academic performance of students.

**Objective** To assess the magnitude academic performance and its associated factors among health science students at Eastern Ethiopian universities.

**Method** An institution based cross sectional study design was implemented on a total of 924 regular undergraduate students of eastern Ethiopian universities. Good academic performance was measured as the students who scored a cumulative GPA of three and above. The study participants were selected using simple random sampling techniques, and a self-administered questionnaire was used to collect data. The collected data was entered and analyzed using SPSS version 25 software. A P-value < 0.2 at bivariate to select variables for multivariable and < 0.05 at multivariable with 95% CI was considered statistical significance.

**Result** A total of 924 participants were included, with a response rate of 98.7%. The overall magnitude of good academic performance among health science students at Eastern Ethiopia University's was 70.5%, with a 95% CI = 67%–73%. Residence [AOR = 2.8, 95% CI = 1.9–3.93], not having a sexual partner [AOR = 2.47, 95% CI = 1.64–3.72], good test competence [AOR = 1.94, 95% CI = 1.4–2.6], good time management [AOR = 2.29, 95% CI = 1.86–3.15], and good strategic study [AOR = 1.81, 95% CI = 1.33–2.45] were significantly associated with good academic performance.

**Conclusion** Increased odds of good academic performance were observed among students with rural residence, sexual partner, good test competence, good time management, and strategic study. A collaborative and multidisciplinary approach is needed to enhance the academic performance of students.

**Keywords** Academic performance, Health science, SMART

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## Introduction

Academic performance is a measure of student achievement in any academic institution. The extent to which a student achieves long- or short-term goals related to education can also be defined, which is measured by examination results and the cumulative grade point average [1].

The problem of academic achievement is one of the most serious problems hindering the work of modern schools and prevents them from fulfilling their goals and missions in an appropriate way. One of the biggest challenges currently facing institutions across the country is student attrition, which is the result of low academic performance. Unlike most obstacles to higher education, which are typically determined by school size and type, student attrition is a widespread issue [2, 3].

Good academic performance of students in higher education institutions plays a major role in students' retention in the university, job opportunities, financial issues, courses, and graduation. A recent study showed that students who have good academic achievements have higher incomes, better employment benefits, and more advancement opportunities. Academically successful students also have higher self-esteem and self-confidence, low levels of anxiety and depression, are socially inclined, and are less likely to engage in substance abuse [4–7].

Studies from different parts of the globe revealed that the magnitude of the good academic performance of health science students at medical and health science schools was 77.3%, 81.15%, and 75%. Other recent studies that assess the magnitude of good academic performance among health science students in Ethiopia have also revealed that 52% and 72.5% of students in Arbaminich and Gondar universities are good academic performers, respectively [8–11].

Factors that could reduce hurdles in achieving and maintaining the required GPA should be identified and improved by university administrators, faculty members, and students. Several factors could act as barriers to students attaining and maintaining a high GPA that reflects their academic performance during their university stay. In the previous study, factors like previous school type (governmental or private), previous academic record in high school, interest in the profession they are studying, self-motivation of students, drug abuse, social and family support, parents/guardians' educational background, gender, and learning preference were identified as major factors associated with the academic performance of students in higher education institutions [8–15].

Although cognitive and learning factors such as academic competence, test competence, time management, strategic studying, and test anxiety are some factors that a student may have to balance to be a high achiever[4], none of them have been evaluated collectively and

specifically in university students in Ethiopia. Therefore, the main objective of this research was to assess the magnitude of the academic performance of health science students in eastern Ethiopia by including cognitive and learning factors, such as academic competence, test competence, time management, strategic studying, and test anxiety, which have not been assessed in Ethiopia.

## Methods

### Study setting and design

An institution-based multicenter cross-sectional study was conducted among health science students at Eastern Ethiopia University's health science colleges in Eastern Ethiopia from September 15 to October 30, 2016. Dire Dawa, Haromaya, and Jigjiga University are higher-level institutions located in the eastern part of Ethiopia. Dire Dawa University College of health sciences is one of the colleges found at Dire Dawa University, hosting five departments and one school at the undergraduate level. Currently, there are a total of 532 students attending their education in regular undergraduate health science programs. Haromaya University is one of the oldest higher learning institutions in Ethiopia. The college of medical and health science is one of the many colleges at Haromaya University, which is located in Harar and hosts a total of seven undergraduate programs. Currently, a total of 810 students attend their education in a regular undergraduate health science program. The other university, which is located in the eastern part of Ethiopia, Jigjiga University. Currently, there are 397 students enrolled in regular undergraduate health science programs. There are a total of four undergraduate programs at the College of Health Science.

### Study population and selection criteria

The study population includes all randomly selected students from selected departments and classes in years who were enrolled in undergraduate programs of health science at Dire Dawa, Haromaya, and Jigjiga University. The study included all regular health science students who were registered from the 2nd to 4th year. Students who were seriously ill at the time of data collection, postgraduate students, and post basic students were excluded from the study.

### Sample size and sampling procedure

The sample size was determined by single population proportion formula by using the following assumptions: 95% confidence level, 27.5% magnitude of low academic performance from previous study conducted at Gondar University, health Science College [12], 3% margin of error, and an expected 10% non-response rate. Where  $Z_{\alpha/2}$  is standard score value for 95% confidence level of

two sides normal distribution ( $Z=1.96$  for 95% Confidence level). Therefore, based on the above assumptions the sample size could be calculated as:

$$n = (Z\alpha/2)^2 \times P \times (1 - P)/d^2$$

$$n = (1.96)^2 \times 0.275(1 - 0.275)/(0.03)^2$$

$$n = 851$$

The sample size for the second objective was calculated but since it was lower than of first objective sample size, so we take the maximum sample size which was 851. Considering 10% non-response rate, total sample size was 936.

#### Sampling technique and data collection procedure

All health science departments of the three universities found in eastern Ethiopia were included in the study. Then the calculated sample size (936) was proportionally allocated to each university's and departments based on the students numbers. Then the proportionally allocated sample size for the department was also again proportionally allocated to each batch/academic year (second, third, and fourth year) based on the number of students. Finally, using their student ID number as a sampling frame, a simple random sampling method was implemented to collect the data. The randomness of the selection was ensured by using the lottery method until we got the required sample size. Data was collected by using a self-administered questionnaire with both open and closed-ended questions in English, which was adapted by reviewing different literature [4, 8, 16–18]. A total of 8 health care workers were recruited for data collection. The self-administered questionnaires have a total of 25 questions and 29 Likert scale statements under 5 sections (Sect. "Introduction": sociodemographic characteristics, Sect. "Methods": previous academic background; Sect. "Result": current academic related; Sect. "Discussions": personal and behavior-related; and Sect. 5: SMART cognition). To assure the data quality control, data collectors obtained two-day training about the aim of the study and the content of the instrument before the actual data collection. A pretest was also done among post basic health science students at the selected universities on 5% of the sample size to modify the questioner two weeks before the actual data collection time.

#### Operational definitions

##### Dependent variable

- *Poor academic performance : a cumulative GPA < 3.00*

- *Good academic performance: a cumulative GPA  $\geq 3.00$  [4].*

#### Independent variable

##### Study Management and Academic Results Test (SMART)

SMART is a tool developed to measure students' study and examination related cognitions, time management, and study strategy [8]. SMART is a self-reported scale with five items for each of the subscales (test competence, academic competence, strategic studying, and time management) and will be measured using a 5-point Likert scale ranging from strongly agree (1) to strongly disagree (5). A score above average will indicate that the student is competent in the respective factor.

Test anxiety Test anxiety is a combination of physiological over-arousal, tension, and somatic symptoms, along with worry, dread, and fear of failure that occurs before or during test situations. The test anxiety Scores will range from 10 to 50. A low score of 10–19 will indicate that they are not suffering from test anxiety, while test measurement scores of 20–50 will indicate the presence of test anxiety [16, 17].

#### Data processing and analysis

After the data collection, the completed questionnaires were checked for completeness and consistency. Then, the data template format was prepared, coded, and entered into EpiData version 4.1. Then data was exported to SPSS version 25 for analysis. Descriptive statistics were summarized using mean and standard deviation as well as percentages and frequencies. The chi square test, binary, and multivariate logistic regression were used to determine the association of independent variables with the academic performance of students. A P value less than 0.05 will be considered significant. Multivariable logistic regression analysis was done for variables with  $p$ -value < 0.2 in bivariate logistic regression analysis to identify factors of academic performance at the confidence interval of 95%.

The model fit was checked by the Hosmer and Lemeshow Test, which is the most reliable test of model fit available in SPSS. Hence, the chi-square value for the Hosmer–Lemeshow test is 4.024, with a significance level of 0.76. This value is greater than 0.05, therefore indicating the goodness of the model fit. A multicollinearity test was also done to assess how much the variance of an estimated regression coefficient increases if the predictors are correlated. All values of the variance inflation factor were less than two (a maximum of 1.07 and a minimum value of 1.02). All values of the tolerance test were also above 0.2 (a maximum of 0.974 and a minimum value of 0.9). These values show that there was no problem with multicollinearity in this study. To check for internal

consistency of the Likert scale item measurement tool for each domain, a reliability analysis was done. The overall value of Cronbach's alpha for items of test anxiety was (0.87), academic competency (0.889), test competence (0.748), time management (0.891), and strategic tool study measurement tool (0.912), reflecting a very high consistency of the instrument to measure competence.

## Result

A total of nine hundred thirty-six (936) students who were enrolled in the undergraduate programs of health science at Dire Dawa, Haromaya, and Jigjiga University were invited to the study. Twelve collected questionnaires were omitted since they were considered invalid (no response, incomplete response, or the same response to each item). Finally, 924 questionnaires were considered valid, and the response rate was approximately 98.7%.

### Socio-demographic characteristics of the study participants for the study on academic performance among health science students at Eastern Ethiopia University's 2022

Regarding the socio-demographic characteristics of the respondents, more than half (520 or 56.3%) of the respondents were male. The largest number of students belonged to the age category of 20–24 [894 (97.8%)], and the mean age of the respondents was  $\pm$ SD 21.61  $\pm$  2.42. The majority of them were fourth-year students 330 (35.8%) and nursing students 239 (25.8%) by year of study and field of study, respectively. In terms of the study participants' initial place of residence, 552 (59.2%) of them were from urban area. In a comparable pattern, 563 (60.9%) of fathers of the study participants, had attended formal education. Out of the 924 study participants, the majority of them 711 (76.9%) were from governmental high schools, and more than half of the students 564 (561%) scored in the range of 400–500 in the Ethiopian university entrance examination (Table 1).

### Magnitude of academic performance among health science students at Eastern Ethiopia University's 2022

This study revealed that the overall magnitude of good academic performance among health science students at Eastern Ethiopia University's was 70.5%, with a 95% CI of 0.67–0.73. The mean CGPA of students was 3.17 (SD  $\pm$  0.48), with a minimum of 2 and a maximum of 3.95 points.

### Current academic-related characteristics of health science students at Eastern Ethiopia University's 2022

As shown in Table 2 below, nearly three-fourths 643 (69.6%) of students responds that their current field of study was their first choice, and one-third 273 (29.5%)

**Table 1** Socio-demographic characteristics of the study participants for the study on academic performance among health science students at Eastern Ethiopia University's 2022 (N = 924)

Characteristics		Frequency	Percent
Gender	Male	520	56.3
	Female	404	43.7
Age	20–24	894	97.8
	25 and above	20	2.2
Year of study	2nd year	278	30.1
	3rd year	316	34.1
	4th year	330	35.8
Field of study	Midwifery	191	20.7
	Medical laboratory	141	15.2
	Psychiatry	83	9
	Anesthesia	44	4.8
	HO	110	11.9
	Environmental health	37	4
	Nursing	239	25.8
Original place of residence	Urban	552	59.7
	Rural	372	40.3
Father educational status	Informal education	361	39.1
	Formal education	563	60.9
Father/ guardian occupation	Farmer	342	37
	Merchant	180	19.5
	Governmental	251	27.2
	Private	40	4.3
	Self employed	111	12
Mother educational status	Informal education	524	56.7
	Formal education	400	43.3
mother/ guardian occupation	House wife	473	51.2
	Farmer	140	15.2
	Merchant	140	15.2
	Governmental	80	8.7
	Private	60	6.5
Type of previous high school	Self employed	31	3.4
	Governmental	711	76.9
	Private	213	23.1
University entrance score	< 400	30	3.2
	400–500	564	61
	> 500	330	35.7

of the students had missed a lecture class in the previous semester. A higher proportion of participants, 654 (70.8%), were studying daily, and 743 (80.4%) of the students studied more than three hours per day (Table 2).

### Personal and behavioral-related characteristics of health science students at Eastern Ethiopia University's 2022

In this study, more than half of the study participants, 544 (58.5.2%), had an intermediate level of English

**Table 2** Current academic characteristics Health science students in Eastern Ethiopia University's, 2022

Characteristics		Frequency	Percent
Current field of study is your first choice	Yes	643	69.6
	No	281	30.4
Missed a lecture class in the previous semester	Yes	273	29.5
	No	651	70.5
How many lecture classes did you miss(N= 273)	Once	112	12.1
	Twice	91	9.8
	Three and above	70	7.6
	Every day	654	70.8
Study pattern	Only if there is exam	270	29.2
	Less than three hour	181	19.6
How many hours do you spend on study per day	Above three hour	743	80.4
	Less than three	273	29.5
Cumulative grade point average in the previous semester	Above three	651	70.5

proficiency. Regarding substance use, one fifth of the study participants 191(20.9%) were involved in substance use. Of the students who use substances, the majority of the students 80 (41.9%) smoke cigarettes, and 70 (36.6%) chew chat. Similarly, one third, 61 (31.9%) of the students use substances daily. In the present study, 151 (16.3%) of the study participants had a sexual partner, of which one-third 50 (33.1%) had more than one sexual partner.

#### Study Management and Academic Results Test (SMART) Test anxiety among health science students at Eastern Ethiopia University's 2022

The test anxiety scores range from 10 to 50. A low score of 10–19 indicate that they are not suffering from test anxiety, while test measurement scores of 20–50 indicate the presence of test anxiety [19, 20]. The present study revealed that about 55.6% of the participants were with test anxiety measurement scores of 20–50.

#### Academic competence among health science students at Eastern Ethiopia University's 2022

Regarding managing the academic course load, about 387 (41.9%) of the study participants agreed and 334 (36.1%) disagreed on their easy understanding of course

materials. In addition to that, about 410 (44.4%) of the study participants agreed on being interested in the courses taught in class, and 404 (43.7%) agreed on doing their best to understand the course materials. In general, the present study the average score of all study participants were 2.95 with minimum and maximum score of 1 and 5 respectively. In addition to that about 581 (62.9%) of students had good academic competence (Table 3).

#### Test competence among health science students in Eastern Ethiopia University's 2022

Almost half, 440(47.6%) of the study participants agreed on easily managing the amount of study material taught for an exam, and about 310 (33.5%) of the study participants agreed on not having difficulty preparing for the examination. The majority of the study participants 411 (44.5%) and 429 (46.4%) disagreed regarding the ease of coping with examination tension and having great difficulty managing the amount of study material for the examination, respectively. In general, the present study the average score of all study participants were 2.90 with minimum and maximum score of 1 and 5 respectively.

In addition to that, the present study revealed that the magnitude of good test competence among health

**Table 3** Academic competence among health science students at Eastern Ethiopia University's 2022

Academic competence	Disagree		Neutral		Agree		Mean	SD
	Frequency	%	Frequency	%	Frequency	%		
I am able to manage the academic course load in my class so far	257	27.8	280	30.3	387	41.9	1.14	0.82
I can easily understand course material taught in in my class	334	36.1	232	25.1	358	38.7	1.02	0.65
I find the courses taught in my class interesting	311	33.7	203	22	410	44.4	1.1	0.87
I am enjoying the classes offered	419	45.3	154	16.7	351	38	0.92	0.91
I always do my best to understand the course material taught in my class	406	43.9	114	12.3	404	43.7	0.99	0.93



science students at Eastern Ethiopia University's was 624 (67.5%) (Table 4).

#### Time management among health science students at Eastern Ethiopia University's 2022

In the current study, more than half, 593 (64.2%) of the study participants disagreed on having difficulty combining study and leisure time. Regarding the ease of organizing the study and leisure time, more than half, 543 (58.8%) of the study participants disagreed. Concerning preparing for an examination in advance, more than half 534 (57.8%) of the study participants disagreed, while about one-third, 307 (33.2%) agreed. In general, the present study the average score of all study participants were 2.33 with minimum and maximum score of 1 and 5 respectively. In addition to that, the present study revealed that the magnitude of good time management among health science students at Eastern Ethiopia University's was 413 (44.7%) (Table 5).

#### Strategic study among health science students at Eastern Ethiopia University's 2022

Almost half of the study participants 458 (49.6%) disagreed with reviewing course material with classmates while studying for examinations, whereas about 373(40.4%) agreed. Half of the study participants, 462 (50%) and 480 (51.9%) were disagreed regarding the testing of knowledge before taking an examination and regularly summarizing the course material in their own words, respectively. In general, the present study the

average score of all study participants were 2.66 with minimum and maximum score of 1 and 5 respectively. In addition to that, the present study revealed that the magnitude of good strategic study among health science students at Eastern Ethiopia University's was 489 (52.9%) (Table 6).

#### Factors associated with academic performance at bivariate and multivariate logistic regression analysis for academic performance and its associated factors among health science students in Eastern Ethiopia University's 2022

In the current study, gender, residence, field of choice, father educational status, sexual partner, test competence, test anxiety, strategic study, time management, and academic competence were associated with academic performance only at COR at  $p < 0.05$ . Multivariate logistic regression analysis was used to minimize the effect of confounding variables and identify real factors in academic performance. Accordingly, residence, sexual partner, test competence, strategic study, and time management were all significantly associated with academic performance at both crude and adjusted odd ratios at  $p < 0.05$  (Table 7).

In this study, the residence of study participants was significantly associated with academic performance. The odds of good academic performance were almost three [AOR=2.8, 95%CI=1.9–3.93] times higher in students with rural residence as compared to their counterparts.

This study also revealed that having a sexual partner was significantly associated with the academic

**Table 4** Test Competence among Health science students in Eastern Ethiopia University's, 2022

Test competency	Disagree		Neutral		Agree		Mean	SD
	Frequency	%	Frequency	%	Frequency	%		
I can easily manage the amount of study material taught for an exam	251	27.2	233	25.2	440	47.6	1.2	0.84
I do not find it difficult to prepare for examination	343	37.1	271	29.3	310	33.5	0.96	0.84
I can easily cope with examination tension	411	44.5	121	13.1	392	42.4	0.97	0.93
I have great difficulty managing the amount of study material for examination	429	46.4	231	25	264	28.6	0.82	0.84

**Table 5** Time management among health science students at Eastern Ethiopia University's 2022

Time management	Disagree		Neutral		Agree		Mean	SD
	Frequency	%	Frequency	%	Frequency	%		
I find it very difficult to combine my study and leisure time	593	64.2	133	14.4	198	21.4	0.57	0.82
I find it difficult to study regularly	593	64.2	133	14.4	198	21.4	0.57	0.82
I usually end up "cramming" for examinations	620	67.1	162	17.5	142	15.4	0.48	0.74
I can organize my study and leisure time easily	543	58.8	137	14.8	244	26.4	0.67	0.86
I always start preparing for an examination well in advance	534	57.8	83	9	307	33.2	0.75	0.92

**Table 6** Strategic study among health science students in Eastern Ethiopia University's, 2022

Strategic study	Disagree		Neutral		Agree		Mean	SD
	Frequency	%	Frequency	%	Frequency	%		
While I am studying, I regularly try to find out what questions professors may ask and how they may ask examination questions	477	51.6	91	9.8	356	38.5	0.86	0.94
I plan well in advance for the best way of handling a study subject	453	49	173	18.7	298	32.3	0.83	0.88
I review course material with my classmates while studying for examinations	458	49.6	93	10.1	373	40.4	0.90	0.944
I test my knowledge before taking an examination by means of mock	462	50	139	15	323	35	0.84	0.90
While studying I regularly summarize the course material in my own words	480	51.9	122	13.2	322	34.8	0.82	0.91

**Table 7** Bivariate and multivariate logistic regression analysis for academic performance and its associated factors among health science students at Eastern Ethiopia University's 2022 (N=924)

Variable		Academic performance		COR(95%CI)	AOR(95%CI)	P-Value
		Poor AP	Good AP			
Gender	Male	140(26.9%)	380(73.1%)	1.33(1.003–1.76)		
	Female	133(32.9%)	271(67.1%)	1		
Residence	Urban	202(36.6%)	350(63.4%)	1		
	Rural	71(19.1%)	301(80.9%)	2.44(1.79–3.34)	2.8(1.9–3.93)	.00
Father educational status	Informal education	134(37.1%)	227(62.9%)	1		
	Formal education	139(24.7%)	424(75.3%)	1.81(1.35–2.39)		
Sexual partner	Yes	61(40.4%)	90(59.6%)	1		
	No	212(27.4%)	561(72.6%)	1.79(1.25–2.57)	2.47(1.64–3.72)	.00
Current field is your Choice	Yes	176(27.4%)	467(72.6%)	1.39(1.03–1.89)		
	No	97(34.6%)	184(65.5%)	1		
Test anxiety	Yes	172(33.5%)	342(66.5%)	1		
	No	101(24.6%)	309(75.4%)	1.53(1.151–2.05)		
Academic competence	Poor	119(34.7%)	224(65.3%)	1		
	Good	154(26.5%)	427(73.5%)	1.43(1.104–1.966)		
Test competence	Poor	118(39.3%)	182(60.3%)	1		
	Good	155(24.8%)	469(75.2%)	1.96(1.46–2.633)	1.94(1.4–2.6)	.00
Time management	Poor	192(37.6%)	319(62.4%)	1		
	Good	81(19.6%)	332(80.4%)	2.46(1.82–3.33)	2.29(1.67–3.15)	.00
Strategic study	Poor	158(36.3%)	277(63.7%)	1		
	Good	115(23.5%)	374(76.5%)	1.885(1.39–2.46)	1.81(1.33–2.45)	.00

performance of students. The odds of good academic performance were two [AOR=2.47, 95%CI=1.64–3.72] times higher in students who did not have a sexual partner as compared to their counterparts.

Test competence was significantly associated with the academic performance of students. Students with good test competence were almost two times more likely to attain good academic points compared to their counterparts [AOR=1.94, 95% CI=1.4–2.6].

Time management was significantly associated with the academic performance of students. Students with good time management were more likely to register

good academic grades compared to their counterparts [AOR=2.29, 95%CI=1.67–3.15].

Lastly, strategic study was significantly associated with the academic performance of students. Students with good strategic study were almost two times more likely to have good academic performance as compared to their counterparts [AOR=1.81, 95%CI=1.33–2.45].

## Discussions

This study revealed that the overall magnitude of good academic performance among health science students at Eastern Ethiopia University's was 70.5%, with a (95%

CI of 0.67–0.73). This finding was almost in line with the study conducted in Gonder (72.5%) [12], Malaga (73.4%) [21], and Tehran University (71.4%) [6]. However, the result of this finding was lower than the studies done at West Coast University (75%) [7], University of Houston (77.3%) [4], China (75.4%) [21], and South Africa (78%) [22]. In fact the academic performance of university students from developed countries tends to be higher than that of their peers in developing countries due to several interrelated factors. These factors encompass educational access, quality of education, socio-economic conditions, and institutional frameworks [19, 23].

It was also higher than studies done at Hawassa University (66%) [17], Arbaminch University (52%) [13], and Mizan Tepi (53.3%) [20]. These discrepancies might be due to differences in sample size, population, or the different tools used to measure academic performance. The previous study's was done with a small sample size; study participants were non-health students except for Mizan Tepi, and theory and skill examinations were used to assess academic performance rather than GPA.

In this study, the odds of good academic performance were almost higher in students with rural residence as compared to their counterparts. This finding was in line with studies conducted at Wolaita Sodo University [16], Gonder University [12], and South African universities [22], Tehran University [6], Ardebil University [24], and Nigeria [25]. This may be due to the fact that students from rural areas may prioritize their education because they aren't exposed to numerous opportunities for work until they enroll in college. It's also possible that they gave their all to finish college with an outstanding score [26].

This study also revealed that the odds of good academic performance were higher for students who did not have a sexual partner as compared to their counterparts. This finding was consistent with studies done at Debre Berhan University [27], Wolaita Sodo University [28], and Sumatera, Utara [29]. The possible explanation could be that students who have a sexual partner can be attributed to reduced distractions from studies, decreased emotional turmoil, avoidance of health risks associated with sexual activity, lower engagement in risky behaviors, and higher academic aspirations. These factors collectively contribute to a more focused and productive educational experience for students who choose to abstain from sexual relationships during their formative years [30, 31].

Test competence was also significantly associated with the academic performance of students. Students with good test competence were more likely to attain good academic points compared to their counterparts. This finding was in line with studies conducted at Pakistan [32], Nigerian pharmacy schools [33], and universities in Amsterdam [34]. This may be due to the fact

that test competence may boost the ability to deal with and muddle through the amount of course material for examinations. Further, it enables students to manage the difficulties associated with the study material as well as prepare for examinations [32, 34].

Students with good time management were more likely to register good academic grades compared to their counterparts. This finding was in line with studies done at Nigerian pharmacy schools [29], universities in Amsterdam [34], Gomel University [35], Mediterranean University [36], Dumlupinar University [37], Malaysia, Abdul-Aziz University [38], Iran [39], Maharashtra, India [40], and Copperbelt University [41]. This may be due to the fact that good time management enables students to prioritize, which in turn gives importance to more important matters. In addition to that, better time management may result in an improved quality of work produced by students. As time management skills improve, students may not have to resort to last-minute studying before examinations, thus improving academic achievement [33, 34].

Lastly, strategic study was significantly associated with the academic performance of students. This finding was in line with studies done in Qatar [42], Tehran [6], Bulacan [43], the VU University Medical Center in Amsterdam [44], and Saudi Arabia [45]. This significant association between strategic study practices and academic performance is supported by evidence highlighting the effectiveness of resource utilization, metacognitive awareness, goal setting, continuous assessment, and structured learning environments. Students who adopt strategic approaches to studying are better equipped to manage their learning processes, leading to improved academic outcomes [43].

### Study implications

Economic growth and the need for skilled workers both depend on education. According to the current data, students' academic achievement was higher than it had been in previous recent Ethiopian research. Students with academic ability have been found to enjoy greater employment benefits, a higher income, and higher levels of confidence and self-worth.

### What does this study add?

Even though few studies were done in Ethiopia, there was no clear evidence regarding the role of cognitive and learning issues such as academic competence, test competence, time management, strategic studying, and test anxiety on the academic performance of students. However, the present study has examined the role of cognitive and learning issues through the Study Management and Academic Results Test (SMART), a validated



international tool. Finally, the three domains of cognitive and learning issues like test competence, time management, and strategic studying were significantly associated with the academic performance of students. So since this is the first finding in Ethiopia, it can be used as baseline data by different responsible bodies and other stakeholders to improve the quality of education.

### Strengths and limitations of the study

The strength of this study includes, that it was a multi-center study with a maximum sample size of 924. In addition to that, the study has used the Study Management and Academic Results Test (SMART), a validated international tool that helps measure study- and examination-related cognitions, time management, and study strategies that have not been used so far in Ethiopia. The study has some limitations like the reliance on self-reported data. Self-reported measures can introduce biases, such as social desirability bias, where participants may overestimate their academic performance or underreport negative behaviors. Additionally, the cross-sectional design of the study restricts the ability to establish causal relationships between identified factors and academic performance, making it difficult to determine whether certain behaviors directly influence academic outcomes or vice versa.

### Conclusions and recommendations

In the present study, nearly three-fourths of the participants had good academic performance. Increased odds of good academic performance were observed among students with rural residence, not having sexual partner, good test competence, good time management, and strategic study. Collaborative and multidisciplinary efforts shall be made to boost students' academic performance.

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### Authors' contributions

MH is the main author and he was made substantial contributions from the start of the research idea to proposal development, data collection, analysis and interpretation of data and preparation of the manuscript. AA, MGM, TED, NKW, DE, LWL, AMD, and MM and, ETF: were participated in proposal development, data analysis and preparation of the manuscript for publication. All authors read and approved the final version of the manuscript.

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### Data availability

Data related to this manuscript is available on the hand of corresponding author and will be obtained under a reasonable request.

### Declarations

#### Ethics approval and consent to participate

Ethical approval was obtained from the Dire Dawa University Institutional Review Board (IRB). A formal letter of permission was submitted to the respective colleges of health sciences of universities under the study. The importance of the study was explained to the participants of the study. A consent letter was attached to the cover page of each questionnaire; the written informed consent was obtained after the objective of the study, the benefits and risks of the study were explained for the study participants. The right of respondents to withdraw from the study or not to participate at all was explained and respected. The information collected from the study participants was kept confidential and was used only for the study purpose.

#### Consent for publication

Not applicable.

#### Competing of interests

The authors declare no competing interests.

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