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EDITED BY
Elvira G. Rincon-Flores,
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REVIEWED BY
Dennis Arias-Chávez,
Continental University, Peru
Cristina Corina Bentea,
Dunarea de Jos University, Romania

*CORRESPONDENCE
Chalachew Kassaw
✉ 1234berekassa@gmail.com

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Predictor of low academic achievement among Dilla university students, southern Ethiopia, 2024

Chalachew Kassaw[1,2]* and Valeriia Demareva[2]

[1]Department of Psychiatry, Dilla University, Dilla, Ethiopia, [2]Department of Cyber Psychology, Lobachevsky State University, Nizhny Novgorod, Russia

Introduction: In Ethiopia, despite its growing higher education sector, student achievement rates remain concerningly low. Understanding the multifaceted factors influencing academic performance is crucial for improving educational equity and quality. This study delves into potential predictors of academic achievement among Ethiopian higher education students, examining individual characteristics, institutional elements, and broader socioeconomic influences.

Methodology: This survey enrolled 362 respondents and was conducted from December 7, 2023 till January 22, 2024. Simple random sampling, validated assessment tools and online data collection methods were employed to select and collect information from respondents. Data entry and analysis was done using Epi-info 7.0 and SPSS 25, respectively. Logistic regression analysis method was used to determine the association between the outcome and independent variable.

Result: The current results show that 166 (45/9%) of participants have GPAs below 3.18. Gender, social sciences/humanities or business/economics majors, suboptimal class environments, inadequate laboratory facilities, chronic illness, class sizes, low emotional coping skills, poor academic self-perception, and high social media use emerged as significant predictors of low academic achievement.

Conclusion: This study identified factors associated with academic achievement. Female students, optimal learning environments, and smaller class sizes were linked to better performance, while social sciences/humanities or business/economics, inadequate facilities, and high social media use increased the risk of low achievement. Personal characteristics like emotional coping, self-perception, and chronic illness also played a role. These findings suggest interventions targeting individual and environmental factors could improve student outcomes.

KEYWORDS

predictor, academic achievement, higher education student, Dilla University, Ethiopia, low-resource setting

Introduction

Learning empowers individuals to shape their own destinies, sharpen their critical thinking abilities, and actively participate in the advancement of their communities (DeBoer, 2019). Ethiopia, home to a population exceeding 100 million, boasts a fast-growing higher education system. The government's unwavering dedication to enhance

access and quality has fueled the remarkable expansion of higher education institutions throughout the country (Jiru, 2020). As compared to other African countries, Ethiopia's university system is young and focused on infrastructure, faculty training expansion and student enrollment (Ferede et al., 2022). While most African countries' higher education institutions receive higher research budgets through international collaborations, Ethiopian universities get only very limited government funding (Akuru, 2019). Currently, there is a strong emphasis on science and technology, quality assurance, economic development and obtaining valuable resources and expertise (Shkabatur et al., 2022). In higher education, academic success stands tall as a key gauge of both student advancement and the effectiveness of teaching and learning practices. It reveals areas where teaching excels and where improvements can be made (Alam and Mohanty, 2023). However, contemporary universities face challenges attracting new students in the face of a competitive educational landscape. To address this and enhance the overall educational standard, student performance needs to be a cornerstone in curriculum development (Uy et al., 2023). Beyond mere grades and rankings, academic achievement holds profound significance for students, directly influencing their future job prospects and overall well-being (Mesmar et al., 2023).

To understand the multifaceted nature of academic success, evaluations should extend beyond grade point average, encompassing factors such as task performance and interpersonal skills. Student satisfaction is a crucial driver of engagement and success in higher education (Jiang et al., 2022). When students feel content with their learning environment, teaching methods, and overall academic experience, they are more likely to flourish, demonstrate commitment to university goals, complete their studies successfully, adapt to the organizational culture, and persist in their chosen field (Almusharraf and Khahro, 2020). This satisfaction fosters a positive learning atmosphere, leading to improved academic performance and higher grades. Modern educational institutions must understand the factors that fuel student achievement to provide effective support and drive student success (Daily et al., 2020). Communication gaps between teachers and students, inadequate guidance from tutors, insufficient learning facilities, and family constraints exacerbated by poverty levels can all hinder academic performance (Alsadoon et al., 2022). Furthermore, research indicates that academic preparedness plays a significant role in student outcomes. In conjunction with student engagement, academic facilities also exert a powerful influence on learning success (Wei and Chou, 2020). Students can unlock their full potential and bridge the achievement gap by cultivating effective study habits, nurturing intrinsic and extrinsic motivation, and fostering a positive learning environment (Chukwunemerem, 2023). Mastering time management, setting clear objectives, and employing interactive learning strategies, such as active participation, are vital for effective studying. Developing these skills empowers students to manage their workload, set achievable goals, and engage meaningfully with course materials (Wolters and Brady, 2021). Furthermore, educational achievement thrives on both internal and external motivators. The intrinsic desire for self-improvement and the external drive for success or recognition of effort can fuel a student's academic journey (Saleh et al., 2023). A supportive learning environment where students feel safe and secure is paramount in fostering collaborative learning and active engagement in academic activities. Cultivating a learning environment characterized by strong teacher-student relationships and abundant resources transforms classrooms into havens for academic success (Heilporn et al., 2021). Equipping classrooms with libraries, books, and supportive faculty mentors provides the foundation for academic excellence to flourish (Oleson, 2023).

Research conducted in diverse cultural and educational backgrounds highlights several predictors of academic achievement, including socio-economic status, parental involvement, student motivation, study habits, and time management skills (Tiwari and Mishra, 2023).

Literature review

There are different grading systems for students of higher education in developed, sub-developed and developing countries (Kaliisa et al., 2019).

In Ethiopia, the grading system for higher education students was out of 4.00 points, and mean grade point averages range from 2.81–3.34 (Kassaw and Demareva, 2023). Various factors associated with academic achievement in higher education students were identified across different parts of the world. In developed countries, cognitive, motivational, emotional, behavioral factors and tuition fee were determined as predictors of academic achievement (Raza et al., 2021), whereas educational resource, quality of education, family and financial support were associated with academic success in developing countries (Rodríguez-Hernández et al., 2020).

There is a scarcity of studies on higher education in Ethiopia, even for universities that have operated for more than two decades. Recognizing the significant variations across cultural and institutional contexts necessitates context-specific research that delves into the unique challenges and strengths of Ethiopian higher education students. To address the context predictors and increase the representatives and generalizability of study findings, this study included variables after extensively reviewing previous literature done at a continent and national level. In addition, various reforms have been applied to Ethiopian higher education students to bring a change in academic success and quality of education. As a result, strict university entrance exam monitoring, re-medial programs for those who had low entrance exam scores, pre-department common course teaching and exit exams for prospective graduates were the main reforms launched in the Ethiopian higher education system. Conducting research after the application of new reforms is vital to understand the impact of such reforms on the academic achievement of higher education students (Van Thong, 2023; Hiran and Dadhich, 2024). Therefore, this study aimed to determine the predictors of academic

Abbreviations: AOR, Adjusted odds ratio; COR, crude odds ratio; CI, confidence interval; P-value, probability value; ETB, Ethiopia birr; SD, Standard deviation; DREEM, The Dundee Ready Education Environment Measure; GPA, Grade point average; SNNPR, Southern Nations and Nationalities peoples and Region of Ethiopia; PhD, Doctor of Philosophy.

achievement and its associated factors among higher education students attending Dilla University, 2024.

Materials and methods

Study area and period

The study took place at Dilla University, situated in the Gedeo zone within the Dilla city administration of the Southern Nations and Nationalities Region (SNNR), Ethiopia. It is located at a distance of 365 km from the capital city, Addis Ababa. Data collection occurred within Dilla University, which comprises three campuses: the main campus, Odaya campus, and the medicine and health campus. Dilla University has 45 undergraduate, 25 masters and 7 PhD degree programs (PhD in Public Health, PhD in Education with four specializations (Curriculum and Teacher Education, Special Needs and Inclusive, Educational Psychology, and Educational Leadership), PhD in Natural Resources Management for Sustainable Agriculture, and PhD in Multiculturalism). The university has courses on engineering and technology, computing and informatics, health and medicine, agriculture and natural resource, business and economics, social science and humanities, educational and behavioral science and law. Currently 5,690 students are attending Dilla University. The university was classified as a second-generation institution, established more than two decades ago, and focuses on applied science disciplines.

Sample size determination

The sample size was determined using the single population proportion formula using a proportion of previous studies (66%; Tadese et al., 2022). It was conducted using a proportion formula $n = Z\alpha/2^{*}pq/d^2$, 95% Confidence interval, 5%, margin of error (d^2) = 0.05, $p = 0.66$, $q = 0.34$ and non-response rate 5%. $n = (1.96)^2$ (0.66; 0.34) / $(0.05)^2$, $n = 345$. Non-response rate = 5%* 345. 345+ 17.

Final sample size = 362.

Sampling procedure

This study focused on undergraduate Dilla university students. To select a representative number of students from each college and department, researchers employed a simple random sampling (SRS) technique. Moreover, a proportional allocation was applied across each college, department, and year/batch of students (Figure 1).

Eligibility criteria

Participation was restricted to regularly enrolled students in the designated departments who were present and competent to participate at the time of data collection. Students excluded from the study included those with non-regular enrollment status, mental or physical limitations, and those who declined participation.

Variables

Dependent variable

Academic performance/achievement/grade point average score.

Independent variables

Sociodemographic characteristics: Age, Gender, Marital status, Religious affiliation, Residence and Monthly pocket money.

Academic factor: Scientific area, Department, Year of Study, Number of students in the class and dormitory, Number of vacation days, well-equipped classroom with comfortable facilities, Internet access, class room condition, Student's perception of teachers, Students' Academic self-perception, Student's social self-perceptions, Disagreements with faculty members, Miss a class due to menstruation, Enough demonstration or laboratory space and English language proficiency.

Psychosocial factors: Self-Esteem, Pro-social behavior, Social media use, Social support, Depression, Suicidal behavior, Perceived stress and Psychological distress.

Health-related factors: Having history of chronic medical illness, Sexual experience, Experience painful or extended menstrual cycles, and receives medicines or visits health facilities due to menstrual-related pain.

Data collection instrument

Grade point average

Grade point average (GPA) reflects student's overall academic standing, based on a weighted average of grades across all courses. It is a summary statistic that represents a student's average performance in their studies over a stated period of time such as one semester (Sadler, 2023). In this study those respondents with grade point average less than a mean score (< 3.18) were considered as Low academic achiever and > 3.18, High academic achiever.

Oslo social support

The Oslo Social Support Scale-3 (OSSS-3) is a brief and cost-efficient instrument designed to evaluate the level of social support experienced by individuals. The total score range from 3 to 14 and score 3–8 was categorized as low social support, 9–12, moderate social support (9–12) and 12–14, stronger social support. The OSSS-3 has demonstrated satisfactory internal consistency, as evidenced by a reliability coefficient of 0.64. (Masa et al., 2022). In this study, the scale had a Cronbach alpha of 0.81.

Sleep quality

The Pittsburgh Sleep Quality Index (PSQI), a 19-item self-report measure, was employed to assess sleep quality over the past month. Using a cutoff score of >5/21, the PSQI demonstrated 82% sensitivity and 56.2% specificity in identifying poor sleep. The PSQI comprises seven 0–3 component scores measuring subjective sleep quality, sleep latency, duration, efficiency, disturbances, medication use, and daytime dysfunction, which are then summed to generate a global score (0–21). Higher scores indicate greater sleep disruption, with ≥5 suggesting poor sleep quality (Nelson et al., 2022). In this study, the scale had a Cronbach alpha of 0.85.

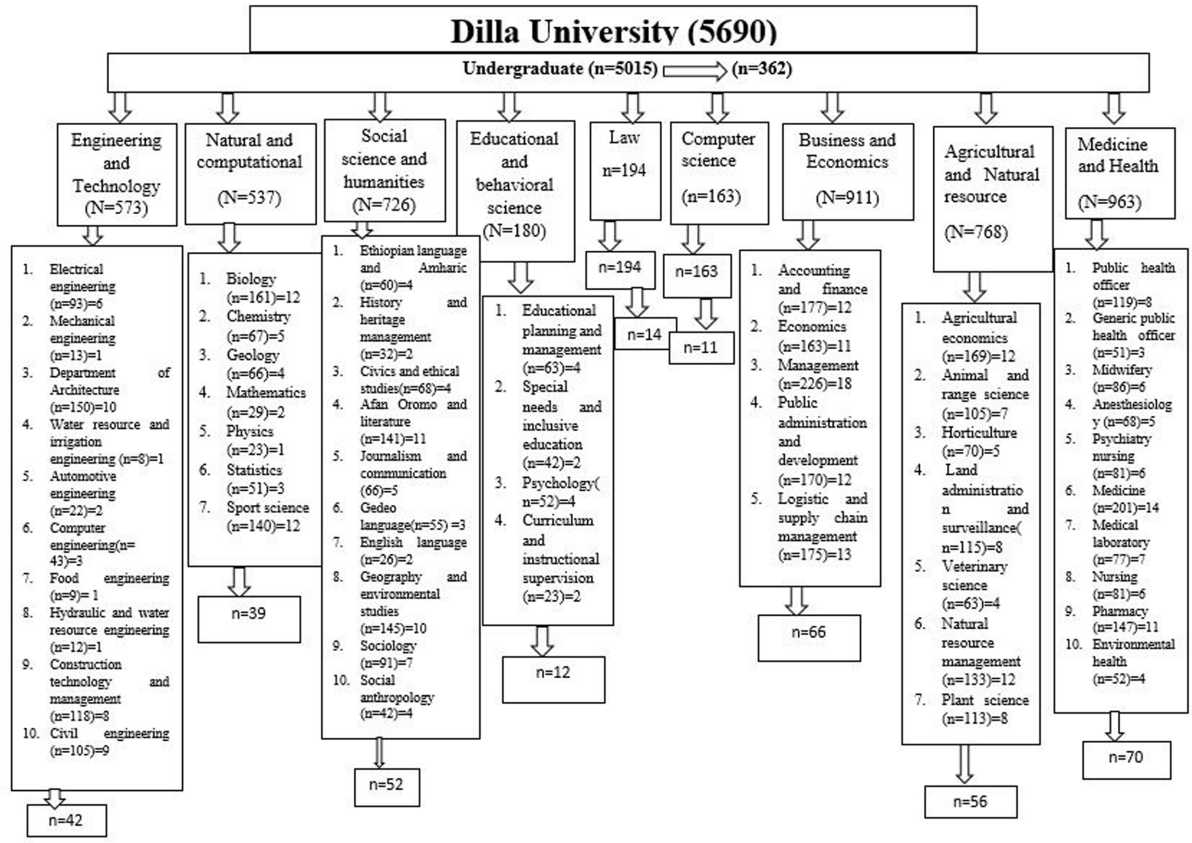

FIGURE 1
Proportional allocation sampling procedure of respondents attending undergraduate programs at Dilla university (n = 362).

Psychological distress

The Kessler Psychological Distress Scale (K-10) is a widely used tool for measuring psychological distress. It consists of 10 questions about emotional well-being, with scores ranging from 10 to 50. Higher scores indicate greater distress, with categories defined as 10–19 (wellness), 20–24 (mild disorder), 25–29 (moderate disorder), and 30–50 (severe distress). The K-10 has a sensitivity rate of 70% and a specificity rate of 67% (Andersen et al., 2011). In this study, the scale had a Cronbach alpha of 0.78.

Perceived stress

The Perceived stress scale (PSS)-10 is a 10-question survey that measures how much stress people feel in their daily lives. Each question asks how often they have experienced something stressful in the past month, with ratings from 0 (never) to 4 (very often). Those respondents scored >13/40 were classified as experiencing perceived stress. The internal consistency of the tool for Ethiopian higher education students was 0.71 (Cohen et al., 1983). In this study, the scale had a Cronbach alpha of 0.84.

Social media addiction

The Bergen Social Media Addiction Scale (BSMAS) is a 6-item scale used to assess social media addiction severity. It covers difficulties associated with excessive social media use within the past year. This cross-culturally validated tool demonstrates good sensitivity and specificity for problematic social media use. The BSMAS has a strong internal consistency, with a Cronbach's alpha of 0.91. It utilizes a five-point Likert scale (1 = very rarely, 5 = very often). Scores are calculated out of 30, with the maximum indicating potential problematic usage (Mengistu et al., 2023). In this study, a score above the mean was considered as "high" and below the mean as "low" social media use. In this study, the scale had a Cronbach alpha of 0.89.

The Beck Depression Inventory (BDI) is a 21-item self-administered scale developed by Aaron T. Beck in 1961 used to assess depression severity. Its strength lies in its well-established psychometric properties, particularly its reliability as evidenced by Cronbach's alpha coefficients above 0.85. The total score range from 0 to 63 and categorized as minimal (1–13), mild (14–19), moderate (20–28), and severe (29–63) depressive symptoms (Teshome Hambisa et al., 2020). In this study, a score below 13/63 was considered as "No depression" and > 13/63, "Yes depression ". In this study, the scale had a Cronbach alpha of 0.89.

Substance use

The alcohol, Smoking, and Substance Involvement Screening Test (ASSIST-3.0) was used to evaluate the individuals' current alcohol, tobacco, chewing gum, and cannabis use. It was designed by the World Health Organization to identify the use of psychoactive substances

and associated issues in patients receiving primary care. The scale has sensitivity and specificity of 97 and 90%, respectively (Qeadan et al., 2023).

The average reliability of the ASSIST has a Cronbach's α range of 0.58–0.90 and has good validity tested in various countries (WHO ASSIST Working Group, 2002). The definition of a current substance user was those individuals who used in the last 3 months. In this study, the scale had a Cronbach alpha of 0.91.

Test anxiety

The Westside Test Anxiety Inventory (WTAI) is a 10-item measurement scale with 5-point Likert response used to determine test anxiety. The total score range from 10 to 50; those who Scored ≥30 indicated test anxiety. The assessment scale has 87 and 79% sensitivity and specificity, respectively (Talwar, 2019). In this study, the scale had a Cronbach alpha of 0.94.

Coping strategy

The Coping Inventory for Stressful life Situations-21 (CISS-21), is a well-validated 21-item self-report measure that demonstrates robust psychometric properties in assessing three distinct coping styles utilized during stressful situations: task-oriented, emotion-oriented, and avoidance-oriented. The instrument exhibits strong internal consistency (Cronbach's alpha exceeding 0.70) and possesses a firmly established three-factor structure. Each three subscale items had a 5-point Likert scale response and respondents who scored above the mean score (Jabbar et al. 2024) were categorized as "high" and "low" if they scored below the mean score. In this study, the scale had a Cronbach alpha of 0.95.

Self-esteem

The Rosenberg Self-Esteem Scale (RSE), developed by the sociologist Morris Rosenberg, is a self-esteem measure widely used in social science research. The RSE self-esteem scale (10-item, 4-point Likert) assessed self-esteem with excellent reliability (test–retest correlations ≥0.85). Low self-esteem responses are operationalized through specific answer patterns: "disagree" or "strongly disagree" for items 1, 3, 4, 7, and 10 and "strongly agree" or "agree" for items 2, 5, 6, 8, and 9. Scoring for items 3, 7, and 9 combines responses, with two or three correct answers counting as one item. The total score ranges from 0 to 30, and those scored <15 were considered as Problematic low self-esteem (Akhter and Ferdous, 2019). In this study, the scale had a Cronbach alpha of 0.82.

Prosocial behavior

The Pro-socialness Scale for Adults (PSA), is a 16-item measure with 5-point Likert scale used to assess prosocial behavior. It demonstrates excellent reliability with Cronbach's alpha of 0.90, McDonald's omega (0.896), and moderate test–retest reliability (0.674). The total score was out of 80 and Scores were interpreted as follows: <55 indicates low prosocial behavior, 55–69 moderate, and > 69 high (Getahun Abera, 2023). In this study, the scale had a Cronbach alpha of 0.76.

The Dundee Ready Education Environment Measure (DREEM) was developed to measure the educational environment in higher education students. It contains a 50-item question survey and covers five subscales: Academic self-perception, student perception of teachers, student's social perception, Students' Perception of Atmosphere, and student perceptions of learning. Scores range from 0 (strongly disagree) to 4 (strongly agree), with higher scores indicating a more positive environment. The total score is out of 200, Scores between 0 and 50 indicate very poor experiences, 51–100 highlight plenty of problems, 101–150 suggest a more positive than negative environment, and 150–200 paint a picture of an excellent learning experience (Agarwal et al., 2020). The survey rates Student perception of teacher on a scale of 0–44, with 0–11 indicating "abysmal," 12–22 suggesting "need for improvement," 23–33 signifying "progressing well," and 34–44 praising "model teachers." Similarly, Students' academic self-perception was assessed on a 0–32 scale, with 0–8 reflecting "feeling entirely lost," 9–16 suggesting "facing challenges," 17–24 indicating "growing positivity," and 25–32 signifying "confidence." Finally, student's social perception or their sense of belonging is evaluated on a 0–28 scale, with 0–7 meaning "feeling miserable," 8–14 suggesting "an unfriendly environment," 15–21 indicating "somewhat neutral," and 22–28 highlighting "a thriving social experience (Costa et al., 2021). In this study, respondents who scored above the mean were considered as "high" and below a mean score, "Low." In this study, the scale had a Cronbach alpha of 0.82.

Data collection tool and procedures

In order to ensure the high quality of the data, the data collectors in this study underwent comprehensive training on data collection procedures and protocols prior to engaging in the actual data collection activities. The data collection process involved the utilization of a self-administered questionnaire in English. The structured google link questionnaire[1] was used to take information from respondents through their telegram, and email account. This questionnaire consisted of various components that assessed different aspects of the respondents. The first part focused on gathering socio-demographic characteristics of the respondents; the second part was about academic factors. The third part examined psychosocial factors (including psychological distress, social media use, beck depression inventory, sleep quality, perceived stress, self-esteem, suicidal behavior and social support) that influence academic achievement. The fourth part of the questionnaire was Health factors related with academic achievement.

Data quality control

Rigorous quality control measures were implemented throughout the data collection process. The questionnaire underwent meticulous design and adaptation, followed by comprehensive training for data collectors and supervisors. A pre-test with a student sample provided valuable feedback, leading to questionnaire revisions and a realistic time estimate for data collection. To maintain high data quality, supervisors closely monitored the process, actively resolving any encountered issues through open communication.

1 https://forms.gle/svGUX6KxmWJ12cSA7

Data processing and analysis

Data analysis was carried out using a SPSS (Statistical Package for the Social Sciences) Version 25. To evaluate associations between academic achievement (dependent) and various factors (independent), both crude and adjusted odds ratios were calculated. Categorical factors underwent chi-square tests for validity. Results were visualized using frequency tables, charts, and graphs. Descriptive statistics included means and standard deviations (normal data) and medians with interquartile ranges (skewed data), ensuring normality checks. Bi-variable and multivariable logistic regression models identified significant associations. Variables with p-values ≤0.025 in bi-variable analysis entered the multivariable model, where factors with p-value <0.05 were deemed statistically significant for affecting academic achievement. The logistic regression analysed linearity, outlier, normal distribution, multi-collinearity and homoscedasticity.

Ethics approval and consent to participate

Adhering to ethical principles, the study obtained formal ethical approval from the college's medical and psychiatric department institutional review board (duirb/694/2023). Prior to involvement, potential respondents received comprehensive information about the study's objectives and their right to withdraw at any point without prejudice. Informed consent, through verbal agreement, was secured from respondents willing to participate before data collection commenced. Respondents confidentiality and information privacy were prioritized, with data access restricted to the principal investigator and advisors, excluding disclosure to any third party.

Results

Socio-demographic characteristics

This study enrolled 362 respondents and 111 (30.6%) of them were female in gender. The majority (73.8%, 267) resided in urban areas, and over half (62.4%, 226) received less than 1,000 Ethiopian birr per month from their parents. Regarding religious affiliation, 48.1% (174) of them identified as Orthodox, 37.2% (135) Protestant, and 14.6% (53) Muslim.

Academic-related factors

The study revealed concerning academic performance and learning environment factors among respondents. The average GPA score was 3.18, and 45.9% ($n = 166$) of respondents scored below the average, indicating low academic achievement. Additionally, a significant portion of respondents reported challenges with the learning environment: 34.0% ($n = 123$) lacked access to comfortable classrooms and 51.6% ($n = 18$) perceived inadequate laboratory facilities. The mean (standard deviation) score of respondents for student perception of teachers was 24.0 (SD = 7.0), 21.0 (SD = 6.0) for academic self-perception, and 14.0 (SD = 4.0) for student social perception. Furthermore, academic preparedness was low, with 66.3% ($n = 240$) of respondents scoring below 65% on the entrance exam and 61.0% ($n = 221$) below 60% in English proficiency. Moreover, 43.3% ($n = 157$) of respondents reported low academic self-perception, and 68.2% ($n = 247$) reporting low student-teacher perceptions (see Table 1).

Health related factors

This survey indicated 75 (20.7%) respondents had chronic medical illness. Notably, 225 (62.2%) of them reported no prior sexual experience. Focusing on the female population, the analysis revealed that 29 (26.2%) of them experienced menstrual pain, with 4 (13.8%) resorting to medication for pain management and 7 (23.5%) missing classes due to menstrual pain.

Psychosocial factors

This finding showed that 175 (48.3%) of respondents reported poor social support, and 182 (50.3%) indicated poor cognitive function. The mean (standard deviation) score of respondents for cognitive function was 18.6 ± 8.0, for student perception was 24.0 ± 7.0, for academic self-perception was 21.0 ± 6.0, and for student social perception was 14.0 ± 4.0. Regarding coping mechanisms, the mean (standard deviation) score was for task coping, 24.0 ± 6.0, emotional coping, 22.0 ± 5.0, and avoidance coping, 22.0 ± 5.0. The mean (standard deviation) score of respondents for social media use was 17.0 ± 4.0. For the above-mentioned psychosocial variable, we categorized scores below the mean/average values as "low" and above the mean score as " high" (see Table 2).

Socio-demographic regression analysis result

According to the multinomial logistic regression analysis result, respondents with female gender had AOR = 0.34, 95% CI (0.19–0.69) to low academic achievement. This finding indicated that females had 66% reduced likelihood of low academic success compared to males (see Table 3).

Academic-related factors

A multivariable logistic regression analysis revealed that respondents studying social sciences and humanities had AOR = 2.11, 95% CI (1.03–2.79) and business and economics AOR = 3.24, 95% CI (2.13–5.68) times higher odds of low academic achievement as compared to respondents in medicine and health science faculties (see Table 4).

Facility-related factors associated with academic achievement

This survey analysis revealed many facility-related factors associated with low academic achievement: having an optimal

TABLE 1 Academic-related factors of respondents attending undergraduate program at Dilla University ($n = 362$).

Variable	Category	Frequency	Percent
Faculty	Engineering and Technology	42	11.6
	Natural and computational science	39	10.7
	Social science and humanities	52	14.3
	Educational and behavioral science	12	3.3
	Law	14	3.8
	Computer science	11	3
	Business and Economics	66	18.2
	Agricultural and Natural resource	56	15.4
	Medicine and Health	70	19.3
Batch Year	1st Year	28	7.7
	2nd Year	59	16.3
	3rd Year	169	46.7
	4th Year	102	28.2
	5th Year	4	1.1
Comfortable class	No	123	34.0
	Yes	239	66.0
Internet	No	179	49.4
	Yes	183	50.6
Enough laboratory equipment	No	187	51.6
	Yes	175	48.3
Disagreement with faculty	No	330	91.2
	Yes	32	8.8
Class room temperature	Cold	12	3.3
	Hot	268	74.0
	Optimal	82	22.7
Category entrance score	< 65%	240	66.3
	>65%	122	33.7
English score	<60%	221	61.0
	>60%	141	39.0
Number of students in class	<28	121	33.4
	>28	241	66.6
Vacation days	<14 days	200	55.2
	> 14 days	162	44.8
Academic self-perception	Low	157	43.3
	High	205	56.6
Student social perception	Low	198	54.6
	High	154	42.5
Student perception of teachers	Low	115	31.5
	High	247	68.2

TABLE 2 Psychosocial-related factors of respondents attending undergraduate program at Dilla University ($n = 362$).

Variable	Category	Frequency	Percent
Social support	3–8	175	48.3
	9–11	173	47.8
	12–14	14	3.9
Social media	< 17 (Low social media)	151	41.7
	> 17 (High social media)	211	58.3
Depression	< 13 score (No depression)	136	37.5
	> 13 score (Yes depression)	226	62.4
Poor sleep quality	< 5 Good sleep quality	77	21.3
	> 5 poor sleep quality	285	78.7
Test anxiety	<30 (no problem)	234	64.6
	>30 (potential problem)	128	35.3
Task coping	Low task coping	127	35.0
	High task coping	235	64.9
Emotional coping	Low emotional coping	122	33.7
	High emotional coping	240	66.3
Avoidance	Low avoidance coping	121	33.4
	High avoidance coping	241	66.6
Cognitive functioning	Poor cognitive functioning	182	50.3
	Good cognitive functioning	180	49.7
Perceived stress	Low (< 13)	50	13.8
	High (> 13)	312	86.2
Psychological distress	No	206	56.9
	Yes	156	43.0
Pro-social behavior	Low	126	34.8
	High	236	65.1
Self esteem	Low	38	10.4
	High	324	89.6

class environment (AOR = 0.24, meaning 76% less likely; 95% CI = 0.12–0.74) and lacking sufficient laboratory facilities (AOR = 2.75, meaning 2.75 times more likely; CI = 1.34–3.64).

Additionally, classes with fewer than 28 students were also associated with lower academic achievement (AOR = 0.27, meaning 73% less likely; CI = 0.16–0.45; see Table 5).

Health-related variables of academic achievement

The absence of chronic illness was associated with a 68% reduction in the odds of low academic achievement (AOR = 0.32, 95% CI: 0.17–0.69; see Table 6).

TABLE 3 Socio-demographic-related factors regression analysis of respondents, January 2024 ($n = 362$).

Variables	Category	Academic achievement		COR (95% CI)	*p*-value	AOR(95% CI)	*p*-value
		< 3.18	>3.18				
Gender	Female	42	69	0.62 (0.39–0.98)	0.03	0.34 (0.19–0.69)	0.04
	Male	124	127	1		1	
Religion	Muslim	32	21	1.29 (0.68–2.47)	0.43		
	Orthodox	81	93	0.74 (0.47–1.16)	0.53		
	Protestant	73	62	1	1	1	
Residence	Rural	42	53	1.09 (0.683–1.75)	0.24		
	Urban	124	143	1	1	1	
Income	< 500 ETB	70	69	0.96 (0.56–1.6)	0.63		
	500–1,000 ETB	43	44	1	1	1	
	1,000–2000 ETB	40	46	1.12 (0.61–2.04)	0.18		
	> 2000 ETB	13	37	2.78 (1.30–5.94)	0.70		

TABLE 4 Academic-related factors regression analysis of respondents, January 2024 ($n = 362$).

Variables	Category	Academic achievement		COR (95% CI)	*p*-value	AOR(95% CI)	*p*-value
		<3.18	>3.18				
Faculty	Engineering and Technology	23	19	2.05 (0.94–4.46)	0.14		
	Natural and computational science	22	17	2.19 (0.99–4.86)	0.32		
	Social science and humanities	30	22	2.31 (1.11–4.8)	0.04	2.11 (1.03–2.79)	0.03
	Educational and behavioral science	7	5	2.37(0.68–8.24)	0.54		
	Law	8	6	2.26 (0.7–7.23)	0.89		
	Computer science	5	6	1.41 (0.39–5.08)	0.45		
	Business and Economics	50	16	5.29 (2.52–11.1)	0.03	3.24 (2.13–5.68)	0.02
	Agricultural and Natural resource	30	26	1.95 (0.96–3.99)	0.69		
	Medicine and Health	26	44	1		1	
Batch year	1st year	3	25	0.12(0.01–1.19)	0.17		
	2nd year	13	46	0.28 (0.04–2.20)	0.28		
	3rd year	111	58	1.91 (0.26–13.9)	0.15		
	4th year	39	63	0.62 (0.08–4.58)	0.23		
	5th year	2	2	1	1	1	1

Psychosocial variables of academic achievement

Respondents with high emotional coping skills were 4.15% more likely [AOR = 4.15, 95% CI: (2.12–6.24)], to have low academic achievement than their counterparts, while students with poor academic self-perception were 1.84 times more likely, AOR = 1.84 (1.27–2.87) and students with low social media use 68% less likely (AOR = 0.32, 95% CI: 0.15–0.67, $p = 0.04$) to have low academic achievement (see Table 7).

Discussion

In Ethiopia, where many students face significant economic challenges, understanding the factors that influence academic achievement is crucial for promoting educational equity and success. This study investigates the predictors of academic achievement among higher education students in low-resource settings, focusing on the interplay between individual, institutional, and socioeconomic factors. By identifying the key drivers of academic success, this study aims to inform interventions that can support students from disadvantaged backgrounds and contribute to a more inclusive and equitable higher education system at the country level.

In this study, the average GPA score of respondents was 3.18, and 166 (45.9%) of them fall under the category of low academic achievement (< 3.18). This finding (mean GPA = 3.18) was higher than the previous study done in Hawassa University (Tadese et al., 2022; Mean GPA = 2.75) and Wollo university (Getahun Abera, 2023; Mean GPA = 2.00) which might be explained by a difference in study setting, study period, curriculum change and multi-departmental involvement

TABLE 5 Facility-related factors regression analysis of respondents, January 2024, (n = 362).

Variables	Category	Academic achievement		COR (95% CI)	p-value	AOR(95% CI)	p-value
		<3.18	>3.18				
Comfortable class	No	102	21	7.49 (4.38–12.8)			
	Yes	94	145	1		1	
Enough internet	No	37	142	0.62 (0.38–1.01)	0.18		
	Yes	54	129	1		1	
Disagreement with faculty staff	No	162	168	1		1	
	Yes	14	18	1.24 (0.6–2.58)	0.15		
Class room temperature	Hot	127	141	1		1	
	Optimal	27	55	0.55 (0.32–0.92)	0.03	0.24 (0.12–0.74)	0.04
	Cold	5	7	0.79 (0.25–2.56)	0.32		
Enough laboratory equipment	No	66	100	3.51 (2.14–5.76)	0.03	2.75 (1.34–3.64)	
	Yes	31	165	1		1	
Entrance score	< 65%	115	125	1		1	
	>65%	51	71	0.81 (0.52–1.26)	0.45		
English score	< 60	102	119	0.78 (0.51–1.19)		1	
	>60	74	67	1			
Class number	< 28	36	85	0.36 (0.23–0.58)	0.04	0.27 (0.16–0.45)	0.03
	>28	130	111	1		1	
Vacation days	<14	115	85	1.06 (0.69–1.60)	0.27	1	
	>14	91	71	1			

of this study. In addition, the science and technology students might contribute to the better teaching-learning environment and student academic performance.

According to this study's result, female respondents had an AOR = 0.34: 95% CI (0.19–0.69), p-value, 0.04, indicating a 66% less likely chance of low academic success than males. This finding was contrary to the study done in Ajman University (Abdelrahman, 2020) and Mizan-Tepi University (Belay and Kassie, 2021), Wollo university (Getahun Abera, 2023) and Addis Ababa university (Ali et al., 2019).

This might be due to several factors, including the growing support program known as the 'zero plan'. This program addresses various challenges faced by female students such as socioeconomic, psychological and academic. It provides them with dedicated study spaces, refreshments, opportunities to discuss their daily struggles, and collaborative learning sessions to tackle tough topics within their fields. Additionally, the program offers financial assistance to students in need, all of which contribute to a more positive and productive learning environment for female students (Semela and Tsige, 2023).

This study found that respondents studying social sciences and humanities had AOR = 2.11, 95% CI (1.03–2.79), p-value, 0.03, while business and economics students had AOR = 3.24, 95% CI = (2.13–5.68), p-value, 0.02 meaning the students had significantly higher odds of low academic achievement than students in medicine and health departments. This finding was similar to a study done at Hawassa University (Tadese et al., 2022) and Wollo university (Getahun Abera, 2023). Disparities in low achievement rates between medical/health and social sciences/business fields may stem from assessment types, student motivation, and curriculum structure. Clear objective assessments in medicine/health lead to less achievement variability compared to subjective evaluations in other fields, potentially affecting low achievement rates. Additionally, stronger intrinsic motivation and clearer career paths in medicine/health might translate to better study habits compared to diverse yet potentially less focused motivations in other fields. Finally, structured curriculums in medicine/health may foster better time management and study skills compared to potentially challenging flexibility in other fields, affecting students who require a more external structure.

In this survey, respondents with an optimal class environment had AOR = 0.24, 95% CI (0.12–0.74), p-value, 0.04, meaning they were 76% less likely to be under the category of lower academic achievement. Participants in classes with fewer than 28 students had AOR = 0.27, 95% CI (0.16–0.45), p-value, 0.03, making them 73% less likely to be under the category of lower academic achievement. This study finding was in line with a study done at Debre Tabor and Mekelle Universities (Tadesse et al., 2022), Gondar University (Gebreslasie et al., 2020) and Jimma university (Tadesse et al., 2022). An optimal classroom environment, characterized by factors like positive teacher-student interactions, clear expectations, and effective learning strategies, might foster a supportive and engaging atmosphere, leading to better academic performance. Additionally, smaller class sizes might enable more personalized attention and interaction, potentially improving focus and comprehension, which could explain the association with higher academic achievement.

This study revealed that respondents who reported a lack of sufficient laboratory facilities had AOR = 2.75, 95% CI (1.34–3.64), p-value, 0.02, were more likely to have low academic achievement then their counterparts. This finding was consistent with a study done in

TABLE 6 Health related factors regression analysis of respondents, January 2024, ($n = 362$).

Variables	Category	Academic achievement		COR (95% CI)	*p*-value	AOR(95% CI)	*p*-value
		<3.18	>3.18				
Chronic illness	No	123	164	0.56 (0.33–0.93)	0.02	0.32 (0.17–0.69)	0.03
	Yes	43	32	1		1	
Sexual experience	No, I do not have any Experience	110	115	1		1	
	Yes, After marriage	30	25	1.25 (0.69–2.27)			
	Yes, Before marriage	46	20	2.40 (1.34–4.32)	0.16		
	Yes, but I am not married	6	10	0.63 (0.22–1.78)	0.63		
Painful menstruation	No	126	141	1		1	
	Yes	40	55	0.81 (0.51–1.31)	0.43		
Medicine for menstruation	No	134	178	1		1	
	Yes	32	18	2.36 (1.27–4.39)			
Miss class due to menstruation	No	134	143	1		1	
	Yes	32	53	0.64 (0.39–1.06)	0.36		

Mekelle university (Gebreslasie et al., 2020) and Addis Ababa university (Kelly et al., 2019). Lacking sufficient laboratory facilities could limit opportunities for hands-on learning and experimentation, hindering conceptual understanding and potentially lowering academic achievement.

This study revealed that respondents who reported that they had no current chronic medical illness were associated with a 68% reduction in the odds of low academic achievement (AOR = 0.32, 95% CI: 0.17–0.69), *p*-value, 0.03. This finding was complemented by a study finding done at Madda-Walabu University (Damota et al., 2019) and South Africa (Bantjes et al., 2021). Chronic illness might contribute to academic challenges through various mechanisms, such as increased absenteeism, fatigue, and difficulty in concentrating.

This study also revealed that respondents with high emotional coping skills AOR = 4.15, 95% CI (2.12–6.24), *p*-value, 0.001 and poor Academic self-perception AOR = 1.84, 95% CI, (1.27–2.87), *p*-value, 0.002 were more likely to have low academic achievement compared to respondents with low emotional coping and high academic self-perception. This study result was similar to a study done at Pakistan university (Kimo and Ayele, 2021) and Wallaga University (Feyisa et al., 2022). Students with high emotional coping skills might struggle to manage academic stress and challenges, leading to decreased focus, motivation, and engagement in schoolwork. Similarly, students with poor academic self-perception might lack confidence in their abilities, reducing their effort and persistence in the face of difficulties.

This study also reported that respondents with low social media use AOR = 0.32 95% CI, (0.15–0.67), *p*-value, 0.04 were about 68% less likely to have low academic achievement. This finding was supported by studies done in Wollo university (Awoke and Zikargae, 2023), and Metu university (Dule et al., 2023). Interestingly, students with low social media use free up time for studies, focus on studying courses, have enough time for academic activities, and are less inclined toward excessive social media use, which results in good academic achievement.

Strength of the study

This study has certain strengths. For example, numerous variables were included after reviewing worldwide research to understand the outcome and ensure adequate random sampling and sample size.

Limitation of study

This study has certain limitations despite a comprehensive assessment of the study subject. The first limitation of the study was a response bias due to the study data collection method being a google link questionaire. This study was done in a single institution and there might be issues of generalizability. There might be cause and effect relationship issues due to the cross sectional study nature. To address the above-mentioned drawbacks, it would be good to complement the study topic witha qualitative method, cohort study design and document review. Moreover, it would be good to include two or three other institutions in the country to increase the generalizability and representativeness of the findings.

Implication of the study

Theoretical implications

Gender and Academic Achievement: This study counters the belief that female students are low achievers. It is better to conduct future research to understand this new insight and difference.

Discipline and Academic Achievement: Respondents from social sciences & humanities and business & economics disciplines were low achievers; as a result, there should be discipline-specific support structures to address possible reasons of success.

Learning Environment and Achievement: The results of the study upkeep the theory that optimal classroom environments, sufficient labs, and smaller class sizes contribute positively to

TABLE 7 Psychosocial-related factors regression analysis of respondents, January 2024, ($n = 362$).

Variables	Category	Academic achievement		COR (95% CI)	*p*-value	AOR(95% CI)	*p*-value
		<3.18	>3.18				
Task coping	Low	61	64	0.76 (0.49–1.17)	0.65		
	High	132	105	1		1	
Emotional coping	Low High	140	100	5.17 (3.12–8.55)	0.001	4.15 (2.12–6.24)	0.001
	High Low	26	96	1		1	
Avoidance coping	Low	56	68	0.81 (0.52–1.24)	0.24		
	High	122	119	1		1	
Cognitive function	Poor	125	57	1		1	
	Good	89	91	1.33 (0.88–2.02)	0.32		
Academic self-perception	Poor	77	80	2.07 (1.35–3.19)	0.001	1.84 (1.27–2.87)	0.01
	Good	65	140	1		1	
Student social perception	Poor	97	101	1		1	
	Good	69	95	0.76 (0.5–1.15)	0.37		
Student perception	Poor	61	54	1.10 (0.71–1.72)	0.34		
	Good	125	122	1		1	
Pro social behavior	Low	55	71	0.87 (0.56–1.35)	0.19		
	High	111	125	1		1	
Perceived stress	No	18	32	0.62 (0.34–1.16)	0.49		
	Yes	148	164	1		1	
Psychological distress	No	99	107	1		1	
	Yes	67	88	0.82 (0.54–1.25)	0.37		
Social support	Poor	103	72	1.07 (0.36–3.22)	0.29		
	Moderate	55	118	0.35 (0.12–1.06)	0.74		
	Good	8	6	1		1	
Self esteem	Low	18	20	0.86 (0.44–1.68)	0.23		
	High	166	158	1		1	
Sleep quality	Good	20	57	0.33 (0.19–0.58)	0.001	1	
	Poor	146	139	1		1	
Depression	Yes	135	91	5.32 (3.26–8.68)			
	No	29	104	1		1	
Social media	Low	58	93	0.59 (0.39–0.91)	0.001	0.32 (0.15–0.67)	0.04
	High	108	103	1		1	
Test anxiety	No	113	121	1		1	
	Yes	53	74	0.77 (0.5–1.19)			

student success. This strengthens the significance of well-resourced institutions.

Student Characteristics and Achievement: The study highlights the importance of individual characteristics like emotional coping skills and chronic illness in academic achievement. This supports theories that well-being and self-management are fundamental for academic accomplishment.

Practical implications

University Admissions and Support: Colleges can reflect these influences during admissions to recognize students who might benefit from additional support.

Course Design and Delivery: Faculties can plan courses with specific requests of disciplines like social sciences & humanities and business & economics in mind.

Campus Environment: Campuses can create optimal classroom environments, improving laboratory facilities, and possibly reducing class sizes.

Student Wellbeing Programs: Higher education institutions can promote programs that heighten emotional coping skills and encourage discussion of chronic health issues among students.

Targeted Interventions: The study proposes modifying interventions to address specific encounters faced by different student groups.

Conclusion

This study identified several factors associated with low academic achievement among university students. Female students were less likely to experience low achievement than to males. Students in social sciences & humanities and business & economics had higher odds of low achievement compared to other disciplines. Furthermore, an optimal class environment, sufficient laboratory facilities, and smaller class sizes were associated with less chance of low academic achievement. The absence of chronic illness and high emotional coping skills were also protective factors. However, low academic self-perception and high social media use were associated with low achievement. These findings suggest the importance of considering gender, academic discipline, classroom environment, and individual characteristics when addressing academic success in university students. Moreover, these findings offer valuable insights for stakeholders seeking to improve academic outcomes of higher education students living in developing nations.

Data availability statement

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found in the article/Supplementary material.

Ethics statement

The studies involving humans adhered to ethical principles and the study obtained formal approval from both Dilla University IRB (DU-IRB/457/2024) and the college's medical and psychiatric department. Prior to involvement, potential participants received comprehensive information about the study's objectives and their right to withdraw at any point without prejudice. Informed consent, through verbal agreement, was secured from Participants willing to participate before data collection commenced. Participant confidentiality and information privacy were prioritized, with data access restricted to the principal investigator and advisors, excluding disclosure to any third party. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

CK: Writing – original draft, Writing – review & editing, Visualization, Data curation, Formal analysis. VD: Conceptualization, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2024.1438322/full#supplementary-material

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