Discover Education

https://doi.org/10.1007/s44217-026-01170-0

Article in Press

Social determinants of academic performance among undergraduate health professional students at Mbarara University of Science and Technology, Uganda

Received: 9 October 2025

Accepted: 23 January 2026

Published online: 02 February 2026

Cite this article as: Namwase J., Maling S., Opolot I. *et al.* Social determinants of academic performance among undergraduate health professional students at Mbarara University of Science and Technology, Uganda. *Discov Educ* (2026). https://doi.org/10.1007/s44217-026-01170-0

Joyce Namwase, Samuel Maling, Ismail Opolot, Julius Kyomya, Ronald Omolo Ouma, Alain Favina, Safina Nakkazi, Rogers Turyamusiima, John Semuwemba, Lydia Nakirya & Edith K. Wakida

We are providing an unedited version of this manuscript to give early access to its findings. Before final publication, the manuscript will undergo further editing. Please note there may be errors present which affect the content, and all legal disclaimers apply.

If this paper is publishing under a Transparent Peer Review model then Peer Review reports will publish with the final article.

ARTICLE IN PRESS

© The Author(s) 2026. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creativecommons.org/licenses/by/4.0/.

ARTICLE IN PRESS

Social determinants of academic performance among undergraduate health professional students at Mbarara University of Science and Technology, Uganda

Joyce Namwase[1], Samuel Maling[1], Ismail Opolot[2], Julius Kyomya[3], Ronald Omolo Ouma[4], Alain Favina[1], Safina Nakkazi[5], Rogers Turyamusiima[6], John Semuwemba[4], Lydia Nakirya[7], Edith K. Wakida[8,9]*

[1]Department of Psychiatry, Faculty of Medicine, Mbarara University of Science and Technology, Mbarara, Uganda

[2]Department of Public Health, Clarke International University, Kampala, Uganda

[3]Department of Pharmacy, Faculty of Medicine, Mbarara University of Science and Technology, Mbarara, Uganda.

[4]Department of Physiology, Faculty of Medicine, Mbarara University of Science and Technology, Mbarara, Uganda

[5]Department of Pediatrics and Child Health, Faculty of Medicine, Mbarara University of Science and Technology, Mbarara, Uganda

[6]Department of Community Health, Faculty of Medicine, Mbarara University of Science and Technology, Mbarara, Uganda

[7]Department of Humanities and Social Sciences, Kampala International University, Kampala, Uganda

[8]Alpha Center for Research Administration, Mbarara, Uganda

[9]Department of Medical Education, California University of Science and Medicine, Colton, CA, United States

ARTICLE IN PRESS

ARTICLE IN PRESS

*Corresponding author: Joyce Namwase, Tel: +256779002276, Email: *joycenamwase@gmail.com*

Abstract

Background: Academic performance among health professional students is influenced by social determinants. This study assessed factors associated with academic performance among undergraduate health professional students at Mbarara University of Science and Technology (MUST), Uganda.

Methods: We conducted a cross-sectional survey among 335 undergraduate students using a self-administered questionnaire. Academic performance was categorized as poor or good. Bivariable and multivariable logistic regression analyses were performed to identify factors independently associated with poor academic performance.

Results: Of the 335 students (mean age 23.86 ± 6.4 years), 70.8% demonstrated good academic performance. In multivariable analysis, female students had significantly higher odds of poor academic performance compared with male students (AOR = 1.95; 95% CI: 1.01–3.78). Third-year students were more likely to have poor academic performance than fifth-year students (AOR = 4.27; 95% CI: 1.06–17.20). In contrast, students with high online social media engagement had significantly lower odds of poor academic performance compared with those with low engagement (AOR = 0.30; 95% CI: 0.12–0.74).

Conclusion: Female gender and being in the third year of study were associated with higher odds of poor academic performance, while high online social media engagement was associated with lower odds of poor

ARTICLE IN PRESS

academic performance. Targeted academic support for vulnerable student groups and structured approaches to online engagement may help improve academic outcomes.

Keywords: Cumulative grade point average, undergraduate health professional students, academic performance, social determinants

Background

Academic performance among university students is influenced by a complex interplay of individual, social, and environmental factors. The definition of academic performance was adopted from [1] as 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).

Poor academic performance remains a significant challenge despite the universities' efforts to provide adequate resources and services for students [2]. Furthermore, even with significant government investment in the education sector, most students fail to achieve good academic performance at all levels of education [3]. Studies reveal that higher learning institutions have an increasing number of students who still do not graduate on time, suggesting that they did not perform well in their studies [4]. While good academic performance is crucial, research highlights the crucial role of social determinants such as finances, study habits, health, and family support in shaping academic outcomes [5].

ARTICLE IN PRESS

Globally, studies have demonstrated that academic performance is shaped by social determinants, such as socioeconomic status, psychosocial factors, and digital engagement [6]. Evidence from both high-income countries and low- and middle-income countries (LMICs) show that household income, academic support, family stress, parental education and excessive social media have an impact on university students' performance [7, 8]. Findings from Uganda indicate that parental education plays a critical role in shaping students' academic achievement, with higher parental educational levels associated with improved academic outcomes [5, 9]. Poor academic performance is often linked to irregular class attendance, low parental education, unstable family dynamics, excessive social media use [10] and frequent clubbing [11]. This study employed the expectancy-value theory (EVT), developed by Atkinson, which postulates that a person's drive to participate in a task is influenced by their belief in the likelihood of success and the importance they attribute to the task [12]. In educational settings, these elements play a crucial role in shaping students' behaviors and performance in academics [13].

Health professions students require special attention in relation to academic performance, as they are expected to impart health knowledge at the community level upon graduation.

Health profession students refer to those undergoing training to maintain health in humans through the application of the principles and procedures of evidence-based medicine and caring [14]. In this study,

ARTICLE IN PRESS

health profession students refer to undergraduate students at MUST who are pursuing a degree in one of the following fields: Laboratory Science, Medicine and Surgery, Pharmaceutical Sciences, Physiotherapy, Nursing, or Pharmacy.

Despite the recognized impact of social determinants on academic performance, research exploring these factors among university students in our setting is limited. This study aimed to examine the social determinants that influence academic performance among university students at MUST. We determined the level of academic performance (good and poor) and identified the social determinants of academic performance among university students at MUST. Understanding these determinants is essential for developing targeted interventions that can mitigate the adverse effects of negative social influences and enhance the academic success of students. Therefore, this study aimed to (1) determine the level of academic performance among undergraduate health professions students at MUST, and (2) identify social determinants associated with academic performance.

Methods

Study Design

This study employed a cross-sectional quantitative design to examine the social determinants of academic performance among undergraduate health professional students. Data were collected between May and June 2024.

ARTICLE IN PRESS

Study Setting

The study was conducted at Mbarara University of Science and Technology (MUST), situated in Mbarara City, southwestern Uganda, approximately 286 kilometers southwest of the capital, Kampala. MUST hosts several undergraduate health sciences programs and attracts students from diverse backgrounds, providing an appropriate environment for examining factors influencing academic performance.

Study population and sampling

The study participants were undergraduate health professions students at MUST. The sample size was 382, calculated using the Kish-Leslie formula [15] using a percentage of 34.4% of poor academic performance [3] , 95% confidence interval, and a non-response rate of 10%.

The study used a database of all undergraduate health professional students obtained from the academic registrar. Participants were selected by simple random sampling using an online app, “Stat Trek random number generator” [16]. Selected participants were then approached by a research assistant with the help of class leaders to explain the study.

Inclusion and exclusion criteria

All undergraduate health professional students at MUST at the time of study, aged 18 years and above, were included in the study, while those with physical illnesses were excluded.

Data collection procedures

ARTICLE IN PRESS

The data were collected using a structured, self-administered questionnaire, which was designed by the research team after reviewing similar published articles [3, 17]. The questionnaire items were adapted to fit the local context of Ugandan university students, and the draft instrument was reviewed by the study team to ensure content validity, clarity, and relevance. The questionnaire was then pretested before it was administered to the study participants. The finalized questionnaire was administered to participants, who were instructed to select the most appropriate response for each item.

Data collection tools

The study questionnaire had 3 sections: (i) Part A had demographic factors, (ii) Part B consisted of questions from the Berkman-Syme Social Network Index (SNI), and (iii) Part C had questions from the Social Media Use Integration scale.

ARTICLE IN PRESS

Academic performance as an outcome variable was categorized as good for students with a CGPA of 3.5 and above, who had no retakes or repeats, and as poor for those with a CGPA of less than 3.5, who had retakes or repeats. This category of academic performance was agreed upon by the research team in consultation with the academic registrar at MUST, and a review of previous literature [3]. The offline social network (SNI) was assessed using the Berkman-Syme Social Network Index [18] which was adopted and has been used frequently in research. The SNI score was used to make three categories of social network groups:1-3 indicates "limited", 4-5 represents "medium", and 6 and above

ARTICLE IN PRESS

represents "diverse" SNI [19]. The SNI has good validity and reliability [18] and has been used in several studies [20].

An online social network was assessed using the Social Media Use Integration scale [21], which was adopted, and the total score is interpreted as a minimum of 24 is “low engagement”, 25 to 35 is “moderate engagement”, and 36 and above is “high engagement”. The scale has good validity and reliability and has been validated in South Africa, where the scale demonstrated validity and reliability across different and demographically diverse samples [21, 22]. The detailed interview guide is provided as a Supplementary File (Dataset 1).

Data quality control

The structured questionnaire was prepared in English, and participants were given a brief explanation of the study's goal, advantages, and risks. The participants were also assured of the privacy of their personal information.

ARTICLE IN PRESS

To ensure clarity and relevance to the study context, the draft study questionnaire was pretested with 10 participants in Bishop Stuart University in Mbarara city in Southwestern Uganda, which has a similar student population to the study setting. The pretest assessed clarity of questions, appropriateness of response options, and general comprehensibility. Feedback from the pretest was used to modify the wording and structure of several items to improve the final instrument. The study tool was reviewed by the study team for completeness and consistency

ARTICLE IN PRESS

The outcome of the pretest was excluded from the primary research. Based on the results of the pretest, the final data-gathering instrument was improved. Additionally, participants had the right to withdraw from the study at any point during the interview if they felt uncomfortable.

Data management and analysis

Data were collected on Google Forms via a link shared with study participants, and the form included checks. The data in the Google document were double-entered into Microsoft Excel and then exported to STATA version 17 (Stata Corp, 4905 Lakeway Drive, College Station, Texas 77845, USA) for cleaning and analysis. The data were stored on a laptop with a protected password to hinder accessibility from those who are not on the study team.

We compared all studied variables to the dependent variable to test if there was a significant difference in the distribution of participant characteristics between the two groups. Categorical variables were summarized using frequencies and proportions, and then a Chi-square test or Fisher's exact test was used to compare the proportions in the dependent variable's categories. Bivariate and multivariable logistic regression analyses were performed to identify independent predictors of academic performance. Variables with a p-value of ≤0.25 in the bivariable logistic regression were included in the final model. A p-value <0.05 was considered to be statistically significant.

Ethical approval

ARTICLE IN PRESS

The Institutional Review Board (IRB) of Mbarara University of Science and Technology approved the study (approval number MUST-2024-1445). Permission was also sought from the Dean, Faculty of Medicine.

Results

Social demographic characteristics of undergraduate health profession students at Mbarara University of Science and Technology

A total of 335 students completed the survey, yielding a response rate of 87.7%. The mean age of participants was 23.86 years (SD = 3.42), with a median (IQR) age of 23 years and age range of 20 - 41 years. Most respondents were male (252/335; 75.2%). The mean year of study was 2.61 (SD = 1.25), Table 1.

Table 1: Baseline characteristics of undergraduate health profession students at Mbarara University of Science and Technology, May - June 2024 (N=335)

Characteristic	Category	n (%)
Gender	Male	252 (75.2)
	Female	83 (24.8)
Religion	Muslem	33 (9.9)
	Catholic	124(37.0)
	Pentecostal	52 (15.5)
	Protestant	104 (31.0)
	Others	22 (6.6)
Program of study	Bachelor of Medical Laboratory Science	54 (16.1)

ARTICLE IN PRESS

	Bachelor of Medicine and Surgery	99 (29.6)
	Bachelor of Science in Nursing	75 (22.4)
	Bachelor of Pharmaceutical Science	26 (7.8)
	Bachelor of Pharmacy	49 (14.6)
	Bachelor of science in physiotherapy	32 (9.6)
Year of study	1	88 (26.3)
	2	67 (20.0)
	3	89 (26.6)
	4	70 (20.9)
	5	21 (6.3)
Type of sponsorship	Government	102 (30.4)
	Private	233 (69.6)

ARTICLE IN PRESS

Proportion of health professions students with good academic performance at Mbarara University of Science and Technology.

Good academic performance was observed in (237/335; 70.8%) of students. A higher proportion of male students demonstrated good academic performance compared with female students (187/252, 74.2% vs. 50/83, 60.2%). Students with a diverse offline social network had a higher proportion of poor academic performance (43/91, 47.3%) compared with those with a limited offline social network, Table 2.

Table 2: Univariate analysis of social determinants of academic performance of undergraduate health profession students at

ARTICLE IN PRESS

Mbarara University of Science and Technology, May - June 2024

(N=335)

Characteristics	Academic Performance n (%)		P value
	Good 237 (70.8)	Poor 98 (29.2)	
Age	23.4 ± 3.0	24.8 ± 4.1	0.001
Sex			
Male	187 (74.2)	65 (25.8)	0.016
Female	50 (60.2)	33 (39.8)	
Religion			
Catholic	92 (74.2)	32 (25.8)	
Moslem	19 (57.6)	14 (42.4)	0.066
Pentecostal	35 (67.3)	17 (32.7)	0.353
Protestant	77 (74.0)	27 (26.0)	0.979
Others	14 (63.6)	8 (36.4)	0.309
Program of study			
Bachelor of Medical Laboratory Science	45 (83.3)	9 (16.7)	
Bachelor of Medicine and Surgery	82 (82.8)	17 (17.2)	0.432
Bachelor of Science in Nursing	65 (86.7)	10 (13.3)	0.090
Bachelor of Pharmaceutical Science	20 (76.9)	6 (23.1)	0.435
Bachelor of Pharmacy	37 (75.5)	12 (24.5)	0.942
Bachelor of science of physiotherapy	26 (81.3)	6 (18.8)	0.921
Year of study			
5	14 (66.7)	7(33.3)	
1	76 (86.4)	12 (13.6)	0.039
2	45 (67.2)	22 (32.8)	0.966
3	48 (53.9)	41 (46.1)	0.293

ARTICLE IN PRESS

ARTICLE IN PRESS

4	54 (77.1)	16 (22.9)	0.336
Type of sponsorship			
Private	164 (70.4)	69 (29.6)	
Government	73 (71.6)	29 (28.4)	0.827
Amount of monthly pocket money, mean ±SD #	105066.4 ± 132058.5	181836.7 ± 173543.1	<0.001
Offline social network			
Limited	146 (77.7)	42 (22.3)	
Medium	43 (76.8)	13 (23.2)	0.891
Diverse	48 (52.7)	43 (47.3)	<0.001
Social Media Use Integration scale (online)			
Low engagement	133 (72.3)	51(27.7)	
Moderate	57(69.5)	25 (30.5)	0.644
High engagement	47(68.1)	22 (31.9)	0.515

ARTICLE IN PRESS

Factors associated with academic performance among health professions students at Mbarara University of Science and Technology, May and June 2024

We conducted both bivariate and multivariate logistic regression analysis to determine factors associated with academic performance among health professions students. In multivariate analysis, female students had significantly higher odds of poor academic performance compared with male students (AOR = 1.95, 95% CI: 1.01–3.78; p = 0.046). Students in their third year of study were more likely to have poor academic performance than those in their fifth year (AOR = 4.27, 95% CI: 1.06–17.20; p = 0.041). In contrast, students with high levels of social media use integration had significantly lower odds of poor academic

ARTICLE IN PRESS

performance compared with those with low engagement (AOR = 0.30, 95% CI: 0.12–0.74; p = 0.009), Table 3.

Table 3: Bivariate and multivariate regression analysis of social determinants of academic performance of undergraduate health profession students at Mbarara University of Science and Technology, May - June 2024 (N=335)

Characteristics	Academic Performance n (%)		COR (95% C.I)	p-value	AOR (95% C.I)	P-value
	Good 237(70.8)	Poor 98(29.2)				
Age in years, Mean ± SD	23.43 ± 3.04	28.89 ± 4.05	1.12 (1.04-1.19)	0.001	1.01 (0.92-1.11)	0.754
Sex						
Male	187 (74.2)	65 (25.8)	1.00		1.00	
Female	50 (60.2)	33 (39.8)	1.89 (1.12-3.20)	0.016	1.95 (1.01-3.78)	**0.046**
Course of study						
Bachelor of Medical Laboratory Science	36 (66.7)	18 (33.3)	1.00		1.00	
Bachelor of Medicine and Surgery	72 (72.7)	27 (27.3)	0 .75 (0.36-1.53)	0.432	1.04 (0.42-2.56)	0.916

ARTICLE IN PRESS

Bachelor of Science in Nursing	60 (80.0)	15 (20.0)	0.50 (0.22-1.11)	0.090	0.63 (0.24-1.66)	0.355
Bachelor of Pharmaceutical Science	20 (76.9)	6 (23.1)	1.46 (0.56-3.83)	0.435	1.43 (0.44-4.57)	0.543
Bachelor of Pharmacy	33 (67.4)	16(32.6)	0.96 (0.42-2.20)	0.942	1.14 (0.42-3.10)	0.792
Bachelor of science in Physiotherapy	21 (65.6)	11(34.4)	1.04(0.41-2.63)	0.921	1.24 (0.39-3.92)	0.705
Year of study						
5	14 (66.7)	7 (33.3)	1.00		1.00	
1	76 (86.4)	12 (13.6)	0.31(0.11-0.94)	0.039	1.05 (0.23-4.75)	0.945
2	45 (67.2)	22 (32.8)	0.98 (0.34-2.76)	0.966	3.62 (0.88-14.84)	0.073
3	48 (53.9)	41 (46.1)	1.71(0.63-4.63)	0.293	4.27 (1.06-17.20)	**0.041**
4	54 (77.1)	16 (22.9)	0.59 (0.20-1.72)	0.336	2.72 (0.63-11.75)	0.178
Amount of pocket money in a month, mean ± SD #	105066.4 ± 132058.5	181836.7 ± 173543.1	1.00 (1.00-1.01)	<0.001	1.00 (0.99-1.00)	0.061
Location of the previous secondary school						

ARTICLE IN PRESS

ARTICLE IN PRESS

Rural	71 (63.4)	41 (36.6)	1.00		1.00	
Urban	166 (74.4)	57 (25.6)	0.59 (0.36-0.96)	0.037	0.63(0.34-1.13)	0.126
Offline social network						
Limited	146 (77.7)	42 (22.3)	1.00		1.00	
Medium	43 (76.8)	13 (23.2)	1.05 (0.51-2.13)	0.891	1.17 (0.51-2.65)	0.706
Diverse	48 (52.7)	43 (47.3)	3.11 (1.82-5.32)	<0.001	1.82 (0.89-3.72)	0.100
Social Media Use Integration scale						
Low engagement	133 (72.3)	51(27.7)	1.00		1.00	
Moderate engagement	57(69.5)	25 (30.5)	1.14 (0.64-2.02)	0.644	0.75 (0.37-1.49)	0.417
High engagement	47 (68.1)	22 (31.9)	1.22 (0.66-2.22)	0.515	0.30 (0.12-0.74)	**0.009**

ARTICLE IN PRESS

Discussion

This study investigated the determinants of academic performance among undergraduate health professional students at MUST. Good academic performance was high (70.8%) according to the study findings. Being Female (AOR =1.95, 95% CI = 1.01-3.78), in year three (AOR = 4.27, 95% CI = 1.06-17.20), and high engagement in online social

ARTICLE IN PRESS

networks (AOR = 0.30, 95% CI = 0.12-0.74) were significant factors associated with academic performance. The observed level of good academic performance of 70.8% is consistent with other studies conducted in Ethiopia [3] and Nigeria [23], which reported prevalences of good academic performance of 66% and 64.2%, respectively. Since Uganda, Ethiopia, and Nigeria are all low- and mid-income countries (LMICs), there may be similarities in the study setting as well as in the study population of undergraduate university students, which accounts for the similarities in these findings.

Although the logistic regression analysis identified the significant determinants of academic achievement among undergraduate students at MUST, the goodness-of-fit assessment revealed a lack of adequacy (Pearson chi-square p = 0.0017). This suggests that this model may not accurately reflect the complexity of factors influencing academic performance. The lack of fit could be due to other variables that were not accounted for and thus incorporated into the model. Other studies reported sleep quality as an important determinant of academic performance. The omission of these variables in the current analysis may have limited the model's explanatory power. Additionally, the model failed to account for potential interaction effects among the variables identified as significant in this study. Thus, future studies should incorporate those other variables and investigate the interaction effects to improve the predictive model and understanding of the factors influencing academic performance.

ARTICLE IN PRESS

Our study found that male students had higher odds of good academic performance, which is similar to some literature from LMICs. For example, [24-27], found a negative correlation between academic performance and gender, suggesting that male students often outperform females. Possible explanations include better study habits or motivation among male students.

Demographic variables, including age, gender, and race, have been shown to influence academic achievement. For instance, [28, 29] highlight the impact of these factors on students' academic outcomes. In Uganda and other LMICs, studies have reported mixed results regarding the relationship between gender and academic performance. For example, [10] reported that female students tend to have better academic outcomes, which may be linked to superior memory retention across various types, including episodic, spatial, short-term, visual, and specific memories. It's important to consider physiological factors that may affect female students' academic performance. Dysmenorrhea, or painful menstruation, can lead to missed lectures and examinations, reduced participation in class discussions, and difficulty concentrating on studies, potentially resulting in lower academic achievement. A study conducted at Princess Nourah Bint Abdulrahman University in Riyadh found that 92% of female students experienced primary dysmenorrhea, with 57.6% reporting moderate-to-severe pain, which significantly impacted their academic performance [30]. These findings underscore the complexity of gender-related academic performance disparities.

ARTICLE IN PRESS

Our study found a significant relationship between academic performance and year of study, with third-year students disproportionately experiencing poor academic outcomes. This observation is consistent with the broader empirical literature, which indicates that as students' progress through university, particularly into clinical or final-year studies, they encounter compounding academic and psychosocial pressures that can impair their performance.

Younger students, often in their first or second year, may benefit from more structured curricula, fewer extracurricular obligations, and heightened motivation, factors that can positively influence academic success [31]. Conversely, third-year students, especially in health-related courses, often face an abrupt shift in expectations, transitioning from theoretical learning to clinical or practical engagement, which can introduce unfamiliar stressors and cognitive overload [32]. For students in three-year degree programs, the final year entails additional burdens such as independent research and career uncertainty. Meanwhile, those in longer programs (e.g., medicine) typically begin intensive clinical placements in their third year. These placements need not only time and emotional energy but also require students to navigate complex interpersonal dynamics with supervisors, patients, and peers, all while attending formal lectures and preparing for their exams [33]. Similarly, [34] showed that maladaptive coping mechanisms, such as procrastination and avoidance, were more prevalent in later-year nursing

ARTICLE IN PRESS

students under chronic stress, contributing to reduced performance and burnout.

According to this study, a low level of online social network activity was substantially linked to poor academic achievement. The negative association observed in the bivariate analysis was reversed in the multivariate model after adjusting for factors such as age, suggesting confounding by these factors.

Our findings are consistent with earlier research that shows good academic performance is associated with students' use of social networks [35-37]. It’s proposed that social media improves academic performance when used as a tool for open learning, resource sharing, peer feedback, engagement, and collaborative tasks, which favor student-centered learning and can improve learning outcomes. Studies reveal that academic performance is better with online engagement when instructors design activities that purposefully exploit social media’s collaborative features, rather than treating platforms as purely social spaces for entertainment. The similarity in these findings may be due to similarity in study population [35] while [37] was systematic review thus may have included literature from similar settings like Uganda.

ARTICLE IN PRESS

However, previous studies have reported mixed findings with some reporting weak, negative or no significant association between social media use and academic performance. For example, this is consistent with earlier research that shows a decrease in academic performance is associated with students' use of social networks, including excessive

ARTICLE IN PRESS

social media usage [17, 26, 27]. It is thought that social media use can distract students from their academic work, especially when students receive both educational and entertainment messages, as it may be hard for them to concentrate on their lectures to improve academic performance [38, 39]. Furthermore, the students may spend their free time on online chatting on social media over academic activities like revising, thus have poor academic performance [39]. These findings could be similar because of the similar age bracket of study participants.

Increased internet use by undergraduate students leads to increased online bullying, i.e., cyberbullying, which leads to a lack of concentration and underperformance [40]. Furthermore, evidence suggests that the overuse of social media is associated with high stress, which negatively impacts students' academic performance [10]. Conversely, some studies have reported no significant association between social media use and academic performance, though many participants believed social media helped them academically [41]. Taken together, the contrasting findings in previous studies highlight the complexity of this relationship between online engagement and academic performance.

ARTICLE IN PRESS

Limitations

This was a cross-sectional study design, which limits causal inference. This was mitigated by robust statistical analysis to establish the strength of associations, providing a strong foundation for hypothesis generation and future longitudinal studies. The findings are based on data from a single medical school, and the generalizability of these results in other

ARTICLE IN PRESS

medical schools is unclear. While acknowledging this limitation, the study design ensured a representative sample from the study site, and the results were contextualized within existing literature to highlight similarities and differences. There is a possibility of recall bias due to self-report, as participants might have overestimated or underestimated certain behaviors, such as social network usage. This was reduced by using validated survey tools, and participants were assured of anonymity to encourage honest responses. There was a lack of controls to limit the survey to selected participants, which may have allowed unauthorized responses and potentially impacted data quality. This was mitigated by screening the responses for inconsistencies, and participation was tracked to ensure that the majority of the data came from the intended population. The study tools used (Berkman–Syme Social Network Index and Social Media Use Integration scale were not validated within our specific study context, which may affect the reliability and generalizability of our findings.

ARTICLE IN PRESS

Conclusions

The study findings suggest that demographic factors and high engagement in online social networks may play a critical role in shaping academic outcomes among these students. These findings highlight the intricate relationship between social factors and academic achievement. This suggests that interventions tailored to gender-specific needs, year of study, and online behavior patterns may foster a more supportive academic environment.

ARTICLE IN PRESS

Recommendation

We recommend that the Ministry of Education develop guidelines on social media use in higher education. Universities should educate students on effective time management and responsible social media use. Targeted academic advising and mentorship programs for female students and those in early years should also be considered.

List of Abbreviations

MRRH: Mbarara Regional Referral Hospital, MUST: Mbarara University of Science and Technology, UISTF: Uganda Independence Scholarship Trust Fund, CGPA: Cumulative Grade Point Average, LMICs: low- and middle-income countries.

Declarations

Ethics approval

This study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical clearance was obtained from the Research and Ethics Committee of Mbarara University of Science and Technology (approval number: MUST-2024-1445). Clinical trial number: not applicable.

Informed consent

Informed consent was obtained electronically from all participants prior to participation.

Consent for publication

Not applicable

ARTICLE IN PRESS

Availability of data and materials. The original contributions presented in the study are included in the article/ supplementary Material (Dataset 1); further inquiries can be addressed to the corresponding author.

Competing interests

The authors declare no competing interests.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors' contributions

JN, IO, and ROO contributed to research conception and data analysis. JN, SN, JK, RT, AF, LN and JS contributed to data analysis, interpretation of data, writing and revision of the draft manuscript. EKW, SM provided scientific guidance throughout the project. All authors have read and approved the final manuscript

ARTICLE IN PRESS

Acknowledgements

We appreciate Uganda Independence Scholarship Trust Fund (UISTF) for their support in form of tuition at the time when this data was collected.

References

1. Talib, N. and S.S.J.P.J.o.P.R. Sansgiry, *Determinants of Academic Performance of University Students.* 2012. **27**(2).
2. Blessing, M., *Challenges Contributing to Poor Academic Performance in University Students and Potential Solutions.* 2024.
3. Tadese, M., A. Yeshaneh, and G.B.J.B.M.E. Mulu, *Determinants of good academic performance among university students in Ethiopia: a cross-sectional study.* 2022. **22**(1): p. 395.
4. Ab Razak, W.M.W., et al., *Academic performance of university students: A case in a higher learning institution.* 2019: p. 1294–1304-1294–1304.

ARTICLE IN PRESS

5. Ozcan, M.J.E.R.J., *Factors affecting students' academic achievement according to the teachers' opinion.* 2021. **6**(1): p. 1-18.
6. Costa, A., et al., *Determinants of academic achievement from the middle to secondary school education: A systematic review.* 2024. **27**(6): p. 3533-3572.
7. Falayi, O.O., *Impact of Parental Involvement on the Academic Performance of African American Elementary School Students: A Multiple Regression Analysis.* 2023.
8. Drajeaa, A.J. and C.J.G.E.R. O'Sullivan, *The influence of parental education and family income on Children's education in Rural Uganda.* 2014. **1**(3).
9. Enock, T. and O.J.N. Living, *Influence of Parental Educational Background on Student Academic Performance in Selected Schools in Makindye Division, Kampala Uganda.* 2025. **5**(1): p. 27-37.
10. Shahjahan, M., et al., *Factors influencing poor academic performance among urban university students in Bangladesh.* 2021. **10**(4): p. 1140-1148.
11. Asrese, K. and H.J.P.o. Muche, *Online activities as risk factors for Problematic internet use among students in Bahir Dar University, North West Ethiopia: A hierarchical regression model.* 2020. **15**(9): p. e0238804.
12. Atkinson, J.W.J.P.r., *Motivational determinants of risk-taking behavior.* 1957. **64**(6p1): p. 359.
13. Rosenzweig, E.Q., A. Wigfield, and J.S. Eccles, *Expectancy-Value Theory and Its Relevance for Student Motivation and Learning*, in *The Cambridge Handbook of Motivation and Learning*, K.A. Renninger and S.E. Hidi, Editors. 2019, Cambridge University Press: Cambridge. p. 617-644.
14. Organization, W.H., *Transforming and scaling up health professionals' education and training: World Health Organization guidelines 2013*. 2013: World Health Organization.
15. Kish, L.J.A.s.r., *Sampling organizations and groups of unequal sizes.* 1965: p. 564-572.
16. Stat, T., *Random number generator*. 2011.
17. Kassaw, C. and V.J.P.o. Demareva, *Determinants of academic achievement among higher education student found in low resource setting, A systematic review.* 2023. **18**(11): p. e0294585.
18. Lubben, J.E., *Assessing social networks among elderly populations.* Family and community health, 1988. **11**(3): p. 42-52.
19. Kornej, J., et al., *The association between social network index, atrial fibrillation, and mortality in the Framingham Heart Study.* Scientific reports, 2022. **12**(1): p. 1-11.
20. Santini, Z.I., et al., *The association of social support networks and loneliness with negative perceptions of ageing: Evidence from the Irish Longitudinal Study on Ageing (TILDA).* Ageing & Society, 2019. **39**(5): p. 1070-1090.

ARTICLE IN PRESS

21. Jenkins-Guarnieri, M.A., S.L. Wright, and B. Johnson, *Development and validation of a social media use integration scale.* Psychology of popular media culture, 2013. **2**(1): p. 38.
22. Maree, T., *The social media use integration scale: Toward reliability and validity.* International Journal of Human–Computer Interaction, 2017. **33**(12): p. 963-972.
23. Olufemi, O.T., A.A. Adediran, and W.J.B.J.o.E. Oyediran, *Factors affecting students' academic performance in colleges of education in Southwest, Nigeria.* 2018. **6**(10): p. 43-56.
24. Munro, A.K., et al., *A systematic review of the menstrual experiences of university students and the impacts on their education: a global perspective.* 2021. **16**(9): p. e0257333.
25. Dahlawi, H., et al., *Effect of dysmenorrhea on the academic performance among students studying in princess nourah bint abdulrahman university, riyadh.* 2021. **5**(2): p. 588-588.
26. Kim, S.Y., et al., *The associations between internet use time and school performance among Korean adolescents differ according to the purpose of internet use.* 2017. **12**(4): p. e0174878.
27. Al-Yafi, K., M. El-Masri, and R.J.J.o.E.I.M. Tsai, *The effects of using social network sites on academic performance: the case of Qatar.* 2018. **31**(3): p. 446-462.
28. Al-Tameemi, R.A.N., et al., *Determinants of poor academic performance among undergraduate students—A systematic literature review.* 2023. **4**: p. 100232.
29. Rahman, S., et al., *Socio-economic factors affecting the academic performance of private university students in Bangladesh: A cross-sectional bivariate and multivariate analysis.* 2023. **3**(2): p. 26.
30. Bakhsh, H., et al., *Prevalence of dysmenorrhea among reproductive age group in Saudi Women.* 2022. **22**(1): p. 78.
31. Ribeiro, Í.J., et al., *Stress and quality of life among university students: A systematic literature review.* 2018. **4**(2): p. 70-77.
32. Kötter, T., et al., *Perceived medical school stress of undergraduate medical students predicts academic performance: an observational study.* 2017. **17**(1): p. 256.
33. Chaabane, S., et al., *Perceived stress, stressors, and coping strategies among nursing students in the Middle East and North Africa: an overview of systematic reviews.* 2021. **10**(1): p. 136.
34. Charlton, A.C. and L.G.J.J.o.P.N. Wofford, *Maladaptive coping behaviors in pre-licensure nursing students: An integrative review.* 2022. **39**: p. 156-164.
35. Ashraf, M.A., et al., *Social Media Improves Students' Academic Performance: Exploring the Role of Social Media Adoption in the Open Learning Environment among International Medical Students in China.* Healthcare (Basel), 2021. **9**(10).
36. Perez, E., et al., *A systematic review of social media as a teaching and learning tool in higher education: A theoretical grounding perspective.* 2023. **28**(9): p. 11921-11950.

ARTICLE IN PRESS

37. Manca, S. and M. Ranieri, *Facebook and the others. Potentials and obstacles of Social Media for teaching in higher education.* Computers & Education, 2016. **95**: p. 216-230.
38. Boahene, K.O., J. Fang, and F.J.S. Sampong, *Social media usage and tertiary students' academic performance: Examining the influences of academic self-efficacy and innovation characteristics.* 2019. **11**(8): p. 2431.
39. Sampasa-Kanyinga, H., J.-P. Chaput, and H.A.J.T.j.o.p.p. Hamilton, *Social media use, school connectedness, and academic performance among adolescents.* 2019. **40**: p. 189-211.
40. Peled, Y.J.H., *Cyberbullying and its influence on academic, social, and emotional development of undergraduate students.* 2019. **5**(3).
41. Takieddin, S.Z., et al., *Effects of social networking services on academic performance and self-esteem: A cross-sectional study among medical students.* J Family Med Prim Care, 2022. **11**(10): p. 6221-6226.

ARTICLE IN PRESS

ARTICLE IN PRESS

ARTICLE IN PRESS

ARTICLE IN PRESS

ARTICLE IN PRESS