

Original Research Article

Perceived effect of COVID-19-related closures and industrial strike actions on the academic performance of pharmacy students in Southwestern Nigeria

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Abstract

Purpose: To evaluate the perceived impact of COVID-19 lockdowns and the recent industrial strike action on the academic performance, study habits and coping mechanisms among undergraduate pharmacy students in Southwestern Nigeria.

Methods: A descriptive cross-sectional survey was conducted among 344 pharmacy students at the 200 to 500 levels at accredited Schools of Pharmacy in Southwestern Nigeria in 2024. Data were obtained using a structured questionnaire and analysed using descriptive statistics, weighted averages (WA), paired t-tests, and the Kruskal-Wallis H test. Due to recall bias, this study is interpreted as a self-reported retrospective survey instead of longitudinal data.

Results: Developing a study timetable (34 %) and prioritising tasks by deadline (32 %) were the most common academic workload strategies. Regular exercise (38 %) and setting realistic academic goals (29 %) were the most frequently cited stress-reduction approaches. A paired t-test revealed no statistical difference between pre-COVID-19 and post-COVID-19 GPA, while a significant difference was observed between pre-COVID GPA and post-strike GPA ($P = 0.107$ and $P = 0.023$, respectively). Weighted averages show a decline in reading culture during the strike and perceived difficulty of exams after the strike, with WAs of 3.95 and 3.81, respectively. Mean rank comparisons using Kruskal-Wallis H tests revealed significant differences between the universities for online learning satisfaction, clinical experience and self-reported GPA.

Conclusion: Both COVID-19 closure and post-pandemic ASUU strike disrupted study habits and academic performance, with the strike producing the larger and statistically significant self-reported GPA decline. Pharmacy schools should establish academic-continuity contingency plans and provide structured academic and mental-health support following prolonged disruptions. Clinical training must be accorded maximum protection during such periods.

Keywords: Academic performance, ASUU strike, Coping strategies, COVID-19, Higher education disruptions, Nigeria, Pharmacy students

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INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic disrupted health-professional education on a global scale. In Nigeria, higher institutions closed in March 2020 under a Federal Ministry of Education directive and remained largely shut for approximately seven months [1]. For pharmacy schools, which depend heavily on synchronised laboratory sessions, clinical rotations, and supervised dispensing practicals, the transition to emergency remote teaching exposed significant deficiencies in digital infrastructure, internet connectivity, and institutional preparedness [2,3]. Studies involving pharmacy students in Nigeria during the lockdown showed elevated psychological distress, declines in reading duration and extension of graduation timelines, among affected cohorts [4,5].

Worsening the pandemic-era disruptions, the Academic Staff Union of Universities (ASUU) has been involved in 16 work stoppages since 1981; these have led to several years of lost academic time [6]. The longest single industrial action in recent memory, the 2022 – 2023 strike, severely compressed the academic calendar across all Nigerian public universities and lasted approximately eight months. Strikes often lead to offsetting academic calendars and the condensation of teaching and examination periods. It could negatively affect students' reading culture, academic motivation, and psychological well-being. It could cause a reduction in grade point averages resulting from inadequate preparation time that post-strike examination affords [7,8]. For pharmacy students, the effects of shutdowns from strikes may be particularly consequential, as laboratory and practical exercises, clinical rotations, and professional matriculation are highly dependent on synchronous contact time [9].

Past work considered either the impacts of COVID-19-associated transitions to online learning environments [10] or the consequences of university-wide strikes [7-8]. However, few studies comparatively considered how both events uniquely impacted pharmacy trainees in Southwestern Nigeria. Given that this survey was cross-sectional and conducted in 2024, it's possible that some of the junior students at 200 level were not enrolled as undergraduates when the 2020 shutdown occurred. Thus, the manuscript's findings have been presented as self-reported and perceived effects, rather than attempting causal longitudinal estimations.

This study aims to determine the perceived impact of school closures during COVID-19 and subsequent ASUU strikes on pharmacy students' academic performance, reading culture, and use of coping mechanisms in Southwestern Nigeria. The differences in students' experiences across Schools of Pharmacy were also determined.

METHODS

Study design and setting

This descriptive cross-sectional survey was conducted between May and July 2024 among undergraduate pharmacy students in five accredited Schools of Pharmacy in Southwestern Nigeria: Obafemi Awolowo University, University of Ibadan, University of Lagos, Olabisi Onabanjo University and Afe Babalola University. The study assessed students' self-reported academic experiences during and after COVID-19-related closures and the post-pandemic ASUU strike. The design was appropriate for describing perceived academic effects and coping strategies but not for establishing causality.

The study participants were registered pharmacy students from the selected universities, specifically those in 200- to 500-level courses who agreed to take part and were available when data were gathered. Students who declined consent or returned substantially incomplete questionnaires were excluded. All five academic levels were included to capture perspectives from both early-career and advanced students, and to reflect the range of COVID-19 and strike exposure across cohorts. As data were collected in 2024, the study did not account for all respondents having firsthand undergraduate experience with the 2020 COVID-19 closure; all findings related to COVID-19 are reported as such and interpreted based on participants' perceived or self-reported experiences.

Population and sampling

Enrolment data sourced from the administrative offices of the respective Schools of Pharmacy revealed the population size (N = 2,890): University of Lagos (630), University of Ibadan (435), Olabisi Onabanjo University (481), Obafemi Awolowo University (622) and Afe Babalola University (722). Using the Krejcie and Morgan formula [11], the minimum sample size required was 339 students. After adjusting for 10 % non-response rate, the target sample size was therefore 373 students. Proportionate stratified random sampling was used to allocate students to each of the universities. Students were thereafter selected from each academic level. A

total of 344 useable questionnaires were returned and analyzed, representing a response rate of 92.2 %.

Ethical clearance

Ethical approval was obtained from the Health Ethics Committee of the Institute of Public Health, College of Health Sciences, Obafemi Awolowo University, Ile-Ife (IPH/ OAU/12/2459). Written informed consent was obtained from participants before they were enrolled in the study. The study was conducted according to the ethical guidelines laid down in the Helsinki Declaration and procedures ensured confidentiality and anonymity of all participants' information.

Instrument design

Data collection instrument was a structured questionnaire containing mainly closed-ended questions to obtain information about participants' sociodemographic characteristics, mode of learning post COVID-19 pandemic, self-reported GPA(s) at the time(s) indicated, current reading habits, coping mechanisms and stress management, as well as views about effects of ASUU strike. Questions were adopted from earlier questionnaire/survey and adjusted to meet the aim of the study [12,13]. Face and content validity were done by experts in pharmacy education. Questions were piloted among 30 pharmacy students to ascertain the clarity and practicability of questions. Reliability coefficient was statistically acceptable ($\alpha = 0.724$).

Data collection

Data were gathered during a span of three months through Google Forms. Informed consent page stated the purpose of the study; participants were free to participate, their information would be confidential, and they could withdraw at any time. Students could only proceed to the questionnaire after they filled in informed consent. It took the students approximately 5 minutes to complete the questionnaire. Students self-reported their GPA if asked to compare.

Data analysis

Data were analysed using IBM SPSS Statistics version 26 (IBM Corp., Armonk, NY, USA). Frequencies and percentages described categorical variables. Weighted averages (WA) summarised five-point Likert-scale items, interpreted as: Strongly Disagree (SD): 0.1 – 1.0;

Disagree (D): 1.1 – 2.0; Neutral (N): 2.1 – 3.0; Agree (A): 3.1 – 4.0; Strongly Agree (SA): 4.1 – 5.0. Paired t-tests compared self-reported GPA at the three time points (before COVID-19, after COVID-19 and after the post-pandemic ASUU strike). The Kruskal-Wallis H test assessed inter-institutional differences in selected academic and coping variables. The significance threshold was set at $P < 0.05$.

RESULTS

Respondents' demographic information

Table 1 shows the socio-demographic characteristics of the 344 participants who responded from the five selected Schools of Pharmacy in Southwestern Nigeria. The majority were aged 21 – 25 years (63 %), females (55 %) and singles (99 %). More respondents were from 500 level (35 %), followed by students in their 400 level (29 %) and 300 level (27 %). Afe Babalola University and University of Lagos had the highest response rate of 23 % each, while 22 % were from Obafemi Awolowo University. Olabisi Onabanjo University and University of Ibadan were 16 and 15 % of the response rates, respectively. Respondents' learning pattern after COVID-19 period was mainly blended (62 %), as 23 % responded that they were learning on campus only, while 15 % responded that they were learning online only.

Coping strategies adopted by pharmacy students

Table 2 summarises coping strategies employed during the pandemic and the ASUU strike. In managing academic workload, 33.7 % of students developed a specific study schedule and 32.3 % prioritised tasks by deadline; however, 25.9 % reported not studying at all during the period. For stress management, regular physical exercise was the most frequently cited strategy (38.1 %), followed by setting realistic academic goals (29.4 %). Creating uninterrupted study time (43.6 %) and designating a dedicated home study space (40.1 %) were the most common study-environment adaptations. Both during COVID-19 and following the ASUU strike, effective time management was rated the single most helpful coping strategy (40 and 34.9 %, respectively).

Effect of the COVID-19 pandemic and ASUU strike on academic performance

Table 3 presents the paired t-test comparisons of self-reported GPA across the three time points.

Table 1: Demographic characteristics of respondents

Variable (n=344)	Items (n=344)	Freq	%
Age (Years)	18-20	99	29
	21-25	218	63
	26-30	24	7
	Above 30	3	1
Gender	Male	154	45
	Female	190	55
Level of study	200	31	9
	300	95	27
	400	100	29
	500	118	35
Marital Status	Married	5	1
	Single	339	99
School of Pharmacy	ABUAD	79	23
	OAU	77	22
	OOU	55	16
	UI	52	15
	UNILAG	81	23
Type of learning after COVID-19	Both Online and on campus	214	62
	On-campus	78	23
	Online	52	15

Table 2: Strategies adopted by pharmacy students to cope with their academic challenges during the COVID-19 pandemic and post-pandemic ASUU strike (N = 344)

Variable	Items	Freq	%
During the pandemic, how did you manage your time for studying and academic coursework?	Developed a specific study schedule	116	33.7
	I did not study at all.	89	25.9
	Prioritised tasks based on deadlines	111	32.3
	Utilised time-management apps or tools	28	8.1
What strategies did you employ to manage stress and maintain mental well-being while coping with academic challenges during the pandemic?	Mindfulness or meditation practices	59	17.2
	Regular exercise or physical activities	131	38.1
	Seeking support from peers or mental health resources	53	15.4
	Setting realistic academic goals	101	29.4
How did you adapt your study environment to accommodate the changes brought about by the pandemic and the post-pandemic ASUU strike?	Set boundaries for uninterrupted study time	150	43.6
	Utilised noise-cancelling headphones or music	56	16.3
	Created a dedicated study space at home	138	40.1
Looking back, what key strategies do you believe were most effective in helping you cope with academic challenges during the pandemic?	Adaptation of study habits	89	25.9
	Effective time management	138	40.1
	Regular communication with peers and professors	44	12.8
	Utilization of online resources	73	21.2
Looking back, what key strategies do you believe were most effective in helping you cope with academic challenges during and after the ASUU strike?	Adaptation of study habits	88	25.6
	Effective time management	120	34.9
	Utilization of online resources	85	24.7
	Regular communication with peers and professors	51	14.8

By contrast, the comparison of pre-COVID-19 GPA with post-ASUU-strike GPA yielded a statistically significant decline (mean difference = -0.105, $P = 0.023$). Since the GPA comparisons are based on self-reported scores and students would have been differentially exposed to COVID-19 based on level, these results are best understood as students' retrospective changes in academics vs. longitudinal academic measures.

Perceived impact of ASUU strike on reading habits and academic confidence

Table 4 presents the weighted-average analysis of students' agreement with five statements about strike-related academic effects. The strongest endorsement was for reduced reading habits during strike periods (WA = 3.95), followed by perceived difficulty of post-resumption examinations (WA = 3.81). Students also agreed

that strikes did not contribute positively to academic performance (WA = 3.53) and that they eroded confidence in the relevance of academic study to career development (WA = 3.40). The weakest but still positive agreement was for a self-reported CGPA reduction when examinations were conducted immediately post-strike (WA = 3.21).

Differences in students' experiences across pharmacy schools

Significant inter-institutional differences were identified for online-learning satisfaction after COVID-19 (χ^2 (4) = 47.54, $P < 0.001$), clinical experience after COVID-19 (χ^2 (4) = 52.01, $P < 0.001$), and self-reported GPA before COVID-19 (χ^2 (4) = 88.25, $P < 0.001$), after COVID-19 (χ^2 (4) = 89.70, $P < 0.001$), and after the ASUU strike (χ^2 (4) = 87.41, $P < 0.001$). Differences were also observed in participation in virtual study groups (χ^2 (4) = 26.50, $P < 0.001$), communication with lecturers (χ^2 (4) = 10.42, $P = 0.034$), and communication with classmates (χ^2 (4) = 9.63, $P = 0.047$). No statistically significant inter-institutional differences were detected for coping strategies or mental wellbeing approaches, suggesting that students across the five institutions managed academic stress in broadly similar ways.

DISCUSSION

This study evaluated pharmacy students' self-reported perceptions of how COVID-19-related closures and the 2022 – 2023 ASUU strike affected their academic performance, reading habits, and coping strategies across five Schools of Pharmacy in Southwestern Nigeria. The findings are interpreted in light of the differential COVID-19 exposure of the sampled cohorts and the self-reported, retrospective nature of GPA data.

The predominant coping strategies reported-structured study scheduling, deadline-based task prioritisation, regular physical exercise, and effective time management- are consistent with adaptive behavioural responses documented in comparable student populations. Teuber *et al*

[14] demonstrated, in a longitudinal study of German university students, that higher physical activity levels were associated with lower stress loads and better academic performance indices during disrupted academic periods. The finding that approximately one quarter (26 %) of students reported not studying at all during disruptions is concerning and aligns with observations from the Lebanese pharmacy student cohort studied by Fadel *et al* [13], in which high levels of psychological distress, including anxiety and depressive symptoms, were documented post-COVID-19, conditions that are known to disrupt motivation and self-regulated learning.

Time management was consistently identified as the most effective adaptive strategy across both disruption events, a finding that concurs with the cross-sectional study by Alyami *et al* [15], which reported a significant positive association between time-management practices and academic performance among students in Saudi Arabia.

The paired t-test for the self-reported pre-COVID-19 and post-COVID-19 GPA showed no statistically significant difference between them. It is important to note that this finding requires careful contextualisation. A non-significant GPA change may reflect recall inaccuracy since the comparison was made retrospectively in 2024 (approximately four years after the 2020 closure), or it could also reflect genuine academic resilience. The absence of a significant GPA effect as obtained in this study is similar to the findings of Cavanaugh *et al* [16], who reported the heterogeneous nature of student performance during COVID-19, contrasting with what was commonly assumed, with some students struggling significantly while others adapting effectively. It is important to emphasize here that most 200-level students (non-repeating) surveyed in 2024 were not yet pharmacy undergraduates in 2020 and would not have directly experienced the closure to provide useful information; their responses regarding COVID-19 would therefore be their perception or those of others.

Table 3: Paired t-tests of GPAs before COVID-19, after COVID-19 and after the post-pandemic ASUU strike

Comparison	Mean diff.	SD	SE mean	95 % CI	t	df	P-value
Pre-COVID-19 GPA vs. Post-COVID-19 GPA	-0.067	0.766	0.041	-0.148 to 0.014	-1.618	343	0.107 (NS)
Pre-COVID-19 GPA vs. Post-ASUU-strike GPA	-0.105	0.847	0.046	-0.195 to -0.015	-2.291	343	0.023*

NS = not significant; * $P < 0.05$. SD = standard deviation; SE = standard error; CI = confidence interval

Table 4: Influence of ASUU strike actions on students' reading habits

S/N	Question	SD	D	N	A	SA	WA
1	ASUU strike has never contributed to your academic performance	38 (11%)	63 (18%)	45 (14%)	74 (21%)	124 (36%)	3.53
2	Your reading habit reduces during ASUU strike	18 (5%)	35 (10%)	38 (12%)	107 (31%)	146 (42%)	3.95
3	Examinations conducted immediately after ASUU strike are usually tough	15 (4%)	36 (10%)	68 (20%)	107 (31%)	118 (34%)	3.81
4	Your CGPA reduces when examinations are conducted immediately after ASUU strike	31 (9%)	72 (21%)	93 (27%)	87 (25%)	61 (18%)	3.21
5	ASUU strike makes you lose confidence in academics as being significant to your career	39 (11%)	56 (16%)	58 (17%)	111 (32%)	80 (23%)	3.40

WA = weighted average. Scale key: SD = Strongly Disagree (1); D = Disagree (2); N = Neutral (3); A = Agree (4); SA = Strongly Agree (5). WA interpretation: 0.1 – 1.00 = strongly disagree; 1.1 – 2.0 = disagree; 2.1 – 3.0 = neutral; 3.1 – 4.0 = agree; 4.1 – 5.00 = strongly agree

Consistent with the broader literature, Isah *et al* [4] found that Nigerian pharmacy students reported decreased reading duration and academic disruptions during the 2020 lockdown, though long-term GPA effects were not tracked longitudinally in that study. The transition to emergency remote teaching, which Hodges *et al* [17] distinguished from planned online learning, occurred under conditions of poor digital infrastructure and unreliable power supply, factors Ebohon *et al* [18] identified as major contributors to student dissatisfaction with virtual learning in Nigerian universities.

In contrast to the COVID-19 findings, the ASUU strike produced a statistically significant self-reported GPA decline. This finding is consistent with the broader literature on industrial action effects on Nigerian university students. Nwagbala *et al* [7] documented significant strike-related academic disruption in Nigerian tertiary institutions, including loss of teaching continuity and reduced student motivation. Akintoye and Uhumwuango [18] similarly reported negative effects of frequent strike actions on student academic outcomes in Edo State universities. Pharmacy-specific evidence from Agbo *et al* [9] and Ofomata and Egolum [19] further confirms these effects. Weighted-average analysis showed the strongest student endorsement for reduced reading during strike periods, consistent with the learning-decay concept analogous to "summer learning loss" [20], particularly relevant given the eight-month strike duration.

Post-resumption examination difficulty and reduced CGPA further supported this pattern, while the reported decline in the students' academic confidence and motivation was consistent with evidence from Nigerian health-professions students affected by prolonged university closures and strike actions [21,22].

Inter-institutional differences in online-learning satisfaction and GPA likely reflect disparities in digital infrastructure and contingency planning [18], while the absence of such differences in coping and mental-wellbeing approaches suggests that student-level resilience support would be universally beneficial across institution types.

Limitations

This study has some limitations that should be considered when interpreting the findings. First, GPA data were entirely self-reported and could not be verified against academic records, introducing social desirability and recall biases. Second, as a cross-sectional study, no causal inferences can be drawn. Third, not all respondents had equivalent first-hand experience of the 2020 COVID-19 university closure: 200-level students were not yet undergraduates; their COVID-19-related responses therefore reflect perceived rather than directly experienced effects. Fourth, the findings are restricted to five Schools of Pharmacy in the Southwest geopolitical zone and may not generalise to pharmacy schools in other regions of Nigeria or to other health-professional programs. Finally, the study was conducted several years after the disruptions of interest, raising questions of recall validity that are particularly relevant for the COVID-19 comparisons.

CONCLUSION

The study found that pharmacy students in Southwestern Nigeria viewed the disruptions brought on by COVID-19 closures and ASUU strike after the pandemic as detrimental to their academic performance, reading patterns, psychological health, and clinical exposure. This

self-reported decline in GPA was larger and statistically significant after ASUU strike than after COVID-19-related closure. Institutional differences showed variability in Students' perceptions of school preparedness and recovery support packages across Schools of Pharmacy. University authorities and pharmacy faculties should prioritize academic-continuity planning, invest in proactive measures that improve blended-learning infrastructure, safeguard clinical learning time, and provide structured academic support and mental-health services after prolonged academic disruptions.

DECLARATIONS

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Conflict of interest

No conflict of interest is associated with this paper.

Contribution of authors

We declare that this work was done by the author(s) named in this article, and all liabilities pertaining to claims relating to the content of this article will be borne by the authors. A.O.J. and A.S.O. conceptualized and designed the study. A.O.J. and A.S.O. coordinated data collection and conducted the data analysis. W.O.E. provided academic oversight and supervision throughout the study. O.E.S., N.S.A., I.P.L., D.A.A., and J.O.O. contributed to data interpretation and provided critical intellectual input. A.O.J. and A.S.O. drafted the initial manuscript. All authors critically revised the manuscript for important intellectual content, read, and approved the final version for publication.

Ethical approval

Ethical approval for this study was obtained from the Health Ethics Committee of the Institute of

Public Health, College of Health Sciences, Obafemi Awolowo University, Ile-Ife (IPH/OAU/12/2459).

Availability of Data and Materials

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Use of Artificial Intelligence / Large Language Models

AI-assisted editing technology was only used for spell-check, grammar suggestions, and structuring of this manuscript. AI was not used to create study data or results, perform statistical analysis, interpret results or draw conclusions. All scientific decision-making and content were performed by the authors.

Use of Research Reporting Guidelines

This study was reported in accordance with relevant elements of the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines for cross-sectional studies.

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