

Adverse Childhood Experiences and Undergraduate Student Outcomes in Ghanaian Higher Education: Prevalence, Developmental Attainment, Academic Achievement and Student Support at the University of Mines and Technology — A Mixed-Methods Study

Peace Sitsofe Kploanyi¹, Peter Simon Kwofie^{2*}, Vincent Dan Teiko³

¹Assistant Registrar and Head, Gender and Disability Mainstreaming, Counselling and Student Support Unit, University of Mines and Technology, Tarkwa, Ghana

²Deputy Registrar and Head, Counselling and Student Support Unit, University of Mines and Technology, Tarkwa, Ghana

³Assistant Registrar and Head, Counselling and Psychosocial Support, Counselling and Student Support Unit, University of Mines and Technology, Tarkwa, Ghana

*Corresponding Author

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ABSTRACT

This study examines adverse childhood experience (ACE) prevalence, psychosocial wellbeing, academic achievement, developmental attainment, protective factors, and help-seeking barriers among undergraduates at the University of Mines and Technology (UMaT), Tarkwa, Ghana — a specialist institution embedded in the Tarkwa-Nsuaem mining economy, which generates a distinctive adversity profile dominated by community violence, economic precarity, and occupational risk to parents. An explanatory sequential mixed-methods design was employed. Phase 1 administered a culturally adapted 25-item ACE instrument alongside validated outcome measures to 358 undergraduate students (response rate: 86.1%). Phase 2 conducted semi-structured interviews with 23 purposively selected participants carrying elevated ACE burdens, analysed using Reflexive Thematic Analysis. ACE prevalence was 83.8% (n = 300), with 56.7% endorsing four or more adversity types and 16.5% endorsing thirteen or more (Very High burden). Multiple linear regression revealed dose-response associations between ACE exposure and lower cumulative weighted average scores ($\beta = -.38$, $p < .001$), elevated psychological distress ($\beta = .41$, $p < .001$), and reduced academic engagement ($\beta = -.29$, $p < .001$). Qualitative analysis identified five themes: normalised adversity and ecological embedding; invisible labour and the performance gap; conditioned hypervigilance and its academic consequences; reactive defiance as a contextually grounded resilience mechanism; and a four-tier help-seeking barrier model encompassing physical visibility, institutional trust, identity-level resistance, and cultural-experiential distance. Integration indicated that the quantitative performance gap is most plausibly understood in light of participant accounts of dissociative-adjacent cognitive disruption under evaluative pressure and the hidden labour of managing concurrent adversity; given the cross-sectional design, these are advanced as interpretive mechanisms rather than causally established pathways. A 62.6 percentage-point gap between ACE prevalence and counselling service uptake (21.2%) reflects a specific barrier architecture. Findings inform trauma-informed counselling, student support policy, and institutional equity reform across Ghanaian higher education.

Keywords: Adverse Childhood Experiences; University Students; Ghana; Mixed Methods; Trauma-Informed Higher Education

INTRODUCTION AND BACKGROUND

Adverse Childhood Experiences (ACEs) — a spectrum of traumatic events occurring before the age of 18 — constitute a pervasive global public health challenge with enduring consequences across sociocultural and economic contexts [29]. Epidemiological analyses indicate that approximately 61% of adults report exposure to at least one ACE, and nearly 25% experience three or more distinct adversities [53]. The cumulative burden of ACEs markedly heightens the risk for depression, anxiety, substance use disorders, suicidal behaviours, and chronic physical health conditions, whilst demonstrably impairing educational achievement [42]. Meta-analytic data drawn from over 500,000 individuals across 22 countries confirm that 16.1% of adults report four or more ACEs — the threshold associated with the sharpest escalation in adverse outcomes [48].

The canonical ACE framework, originating from the landmark Kaiser Permanente study [29], identifies ten adversity categories across three domains: abuse (physical, emotional, sexual), neglect (physical, emotional), and household dysfunction (parental separation, domestic violence, substance abuse, mental illness, incarceration). Despite its influence, this framework has been critiqued for insufficient attention to structural determinants — systemic racism, forced migration, economic precarity, community violence, and peer victimisation — that disproportionately intensify adversity among vulnerable populations beyond the household [32, 40, 59]. These limitations are especially salient in low- and middle-income countries (LMICs), where ACE research is predominantly informed by paradigms developed in high-income Western contexts [20, 39].

Within sub-Saharan Africa, data from Violence Against Children and Youth Surveys (VACS) across multiple countries indicate that over 72% of respondents have experienced at least one ACE [5]. In Ghana specifically, research in the Cape Coast Metropolis documents that 84.9% of children and adolescents have experienced at least one ACE, with community violence (50.2%), parental separation (34.0%), physical abuse (33.4%), and emotional abuse (28.9%) as the leading adversity types [4]. Parallel findings from the Agbogbloshie informal settlement in Accra show 82.2% of emerging adults reported at least one ACE [65].

Despite this documented prevalence, empirical research addressing ACEs and their consequences for university students in Ghana and sub-Saharan Africa remains limited. Virtually no published research focuses on specialist institutions such as UMaT, Tarkwa — a context with distinctive socioecological characteristics arising from the Tarkwa-Nsuaem mining economy [11, 58]. There is consequently an urgent need for contextually grounded, mixed-methods research generating evidence capable of informing trauma-informed counselling, student support, and institutional policy within Ghanaian higher education. This paper reports a completed explanatory sequential mixed-methods study conducted at UMaT, integrating quantitative data from 358 participants with qualitative interviews from 23 purposively selected participants, to address this gap.

Research Questions

This study was guided by five research questions:

RQ1: What is the prevalence, pattern, and cumulative burden of ACEs among undergraduate students at UMaT, and how do these differ across gender, age, year of study, family structure, socioeconomic background, and academic discipline? (Phase 1)

RQ2: To what extent are ACEs associated with developmental attainment, psychosocial well-being, and academic achievement among undergraduate students? (Phase 1)

RQ3: What protective factors — including self-regulation, positive childhood experiences, and social support — moderate the relationship between ACE exposure and student outcomes? (Phase 1)

RQ4: How do students with elevated ACE exposure describe their developmental histories, coping strategies,

and perceptions of institutional support at UMaT? (Phase 2)

RQ5: How do quantitative associations between ACE exposure and student outcomes compare with students' own accounts of the mechanisms linking adversity to their academic and psychosocial functioning? (Integration)

CONCEPTUAL FRAMEWORK

Bronfenbrenner's Ecological Systems Theory

Bronfenbrenner's Ecological Systems Theory (EST) provides the overarching structural scaffold [17]. EST conceptualises child development as shaped by the dynamic interaction of nested systems: the microsystem (immediate family, school, peers), the mesosystem (interactions among microsystem elements), the exosystem (parental employment, community services), the macrosystem (cultural values, national policy, economic structures), and the chronosystem (change over time). Within this framework, childhood trauma is understood as a multifactorial phenomenon arising from the complex interplay between proximal factors — parental instability, household dysfunction — and distal determinants including poverty, systemic discrimination, and deficiencies in social protection mechanisms. Higher education institutions enter this model as exosystemic actors capable of either amplifying developmental vulnerability or deliberately cultivating protective conditions through trauma-informed policy and practice.

Developmental Psychopathology

Developmental psychopathology provides the mechanistic lens through which this study examines pathways from ACE exposure to adverse outcomes [22]. This framework holds that ACEs disrupt biological, cognitive, and social regulatory systems in a cumulative, dose-responsive manner — dysregulating the hypothalamic-pituitary-adrenal (HPA) axis, compromising neural substrates for executive function and memory, and generating maladaptive patterns of attachment and interpersonal relating. Critically, the framework also emphasises equifinality (multiple pathways to the same outcome) and multifinality (the same adversity producing divergent outcomes across individuals).

Arnett's Emerging Adulthood Framework

University attendance in Ghana, as elsewhere, occurs during the developmental period Arnett [9] terms emerging adulthood — roughly ages 18 to 29. This period is characterised by five defining features: identity exploration, instability, self-focus, feeling in-between adolescence and adulthood, and a sense of possibilities. Students carrying unresolved childhood adversity enter a developmental stage that already demands significant self-regulatory capacity, identity consolidation, and relational investment — precisely the capacities most compromised by ACE exposure [10]. Emerging adulthood is also the peak period for the clinical onset of trauma-related psychiatric disorders, making the university setting both a risk environment and a crucial early intervention opportunity.

Resilience Theory

Resilience theory complements developmental psychopathology by foregrounding the conditions under which individuals exposed to significant adversity achieve positive developmental outcomes [51]. Rather than treating resilience as a fixed personal trait, contemporary scholarship understands it as a dynamic process emerging from the interaction of individual capacities (self-regulation, mental health literacy), relational resources (safe and nurturing relationships, mentoring), and cultural–community supports (Ubuntu values, faith networks, communal identity) [1, 15, 28].

Integrative Explanatory Model

Synthesising these four frameworks yields the following explanatory model. ACEs arise from the intersection of household-level dysfunction and broader ecological stressors operating across Bronfenbrenner's nested systems. They disrupt developmental regulatory systems during emerging adulthood, producing cumulative risk for adverse psychological, social, and academic outcomes. The severity and nature of these outcomes are moderated by individual, relational, cultural, and institutional protective factors. Universities enter this model as exosystemic actors capable of either compounding vulnerability or actively cultivating resilience.

LITERATURE REVIEW

ACE Frameworks and Typology

The Traditional ACE Framework

The seminal study by Felitti et al. [29], drawing on a cohort exceeding 17,000 individuals at the Kaiser Permanente Health Appraisal Clinic, delineated ten adversity categories across three domains — abuse, neglect, and household dysfunction — and established a dose-response relationship between cumulative ACE exposure and adverse health outcomes. This framework remains foundational; however, it was developed in a predominantly White, middle-class, insured American population, and its household-centric structure renders it insensitive to adversities prevalent in other socioecological contexts [20, 32]. Physical abuse is empirically associated with aggression, emotional dysregulation, and academic difficulties [36]. Emotional abuse — defined by persistent psychological maltreatment — is a strong predictor of depression, anxiety, and social maladjustment [52]. Household dysfunction generates chronic unpredictability that elevates lifelong psychiatric risk [24].

Expanded ACE Frameworks

Contemporary scholarship extends the ACE construct beyond the household to encompass community violence, peer victimisation, economic hardship, discrimination, caregiver separation through migration, and achievement-related proxy adversities [32, 44, 64]. Luthar, Kumar, and Zillmer (2021) introduced Proxy-ACEs (P-ACEs) to describe emotionally harmful familial environments — chronic parental criticism, perfectionist pressure — that do not meet threshold criteria for traditional abuse but are associated with a two-to-sixfold increased risk for psychiatric disorders. Polyvictimisation research demonstrates that ACEs cluster in distinct profiles shaped by the specific combination of adversities encountered, not merely their count, making Latent Class Analysis (LCA) the methodologically appropriate analytic technique [32].

Prevalence: Global, African, and Ghanaian Contexts

Globally, approximately 61% of adults report at least one ACE, with 16.1% reporting four or more [48]. Prevalence is markedly higher in LMICs: VACS data across sub-Saharan Africa indicate that over 72% of adults have experienced at least one ACE [5]. In Ghana, 84.9% of children and adolescents in the Cape Coast Metropolis have experienced at least one ACE, with 36.9% exposed to four or more [4]. In higher education specifically, 64.1% to 71.4% of Ghanaian tertiary students report childhood adversity [11, 58]. The Ghanaian ACE profile — dominated by community violence and structural adversity — argues strongly for ecologically expanded instrumentation.

Ecological Risk Factors for ACEs in Ghana

The aetiology of ACEs in Ghana reflects convergence of structurally embedded risk factors across ecological levels. At the macrosystem level, economic precarity creates conditions of chronic stress that compromise caregiving quality [35]. The Tarkwa-Nsuaem mining economy represents a particularly distinctive exosystemic

context: ASM communities are characterised by occupational injury and fatality risks to parents, economic volatility tied to commodity prices, and elevated community violence [13]. At the microsystem level, the normalisation of punitive disciplinary practices — embedded in cultural norms prioritising deference to authority — constitutes a significant risk factor, compounded by gendered power asymmetries and fragmented child protection legislation [2, 3].

Impact of ACEs on Developmental and Academic Outcomes

Prolonged toxic stress dysregulates the HPA axis and compromises neural substrates essential for executive function, impulse control, and memory — the cognitive foundations of learning [22, 46]. Students with ACE histories exhibit diminished engagement, elevated absenteeism, and lower academic attainment [68]. In higher education, unresolved adversity manifests as difficulty adapting to academic demands, impaired social connection, maladaptive coping, and underutilisation of institutional support [7, 12]. In sub-Saharan Africa, cumulative ACEs are strongly associated with substance use disorders, major depressive episodes, and persistent suicidal ideation [56, 63].

Protective Factors and Interventions

Self-regulation enables individuals to manage emotional responses and sustain goal-directed behaviour under adverse conditions, directly counteracting executive function deficits produced by toxic stress [34]. Positive childhood experiences (PCEs) are independently associated with a 7–14% reduction in self-harm, suicidal ideation, and mood disorders [19, 27]. In African contexts, Ubuntu — embodying collective responsibility and social interconnectedness — provides a culturally embedded framework for trauma buffering [1, 60]. In Ghana's resource-constrained environment, task-shifting approaches and collaborative models integrating faith leaders with mental health practitioners offer scalable, culturally acceptable alternatives to Western clinical models [38].

METHODOLOGY

Research Design

This study employed an explanatory sequential mixed-methods design, grounded in the pragmatic paradigm. Phase 1 (quantitative) established ACE prevalence, patterns, and statistical associations; Phase 2 (qualitative) explained, deepened, and contextualised those findings. This sequencing is appropriate for ACE research because quantitative designs reveal what associations exist between adversity exposure and developmental or academic outcomes, whilst qualitative inquiry addresses why these associations manifest differently across individuals [25]. Ho, Potash, Fu, and Cheng (2019) demonstrated that integrating quantitative and qualitative data in childhood adversity research enabled identification of culturally specific resilience strategies inaccessible through quantitative methods alone.

Researcher Positionality

All three authors hold institutional roles within the Counselling and Student Support Unit (CSSU) at UMaT — the principal investigator as Deputy Registrar and Head of the CSSU, and the co-authors as Assistant Registrars heading the Gender and Disability Mainstreaming and Counselling and Psychosocial Support functions respectively. This shared institutional embeddedness constitutes a collective positionality requiring explicit mitigation. Several strategies were employed. Survey administration was conducted by trained research assistants who are not UMaT staff. All interviews were conducted by the principal investigator alone; co-authors were not present during data collection and had no access to participant identifiers. Interview participants received a separate consent document emphasising the researcher's role as investigator, distinct from institutional role. Qualitative data were independently coded by the principal investigator and reviewed by one co-author who had not conducted interviews, with disagreements resolved through discussion and documented in the audit trail.

Positionality effects were substantiated in the data: several participants opened interviews by directly questioning whether the dual role could be maintained, and these dynamics are documented in the reflexivity journal and discussed in the limitations. Positionality is treated as an explicit methodological consideration rather than an unexamined threat to validity.

Study Setting and Sampling

The study was conducted at the University of Mines and Technology (UMaT), Tarkwa, Ghana — a specialist technical university within the Tarkwa-Nsuaem Municipality, Western Region. UMaT's student population is predominantly drawn from the Tarkwa-Nsuaem mining belt, characterised by ASM activity, associated occupational hazards, environmental health burdens, economic dependency on volatile commodity prices, and elevated rates of community violence.

Phase 1 Sampling (Quantitative)

The target population comprised all enrolled undergraduate students at UMaT. Following a priori power analysis for multiple linear regression (medium effect size $f^2 = 0.15$, $\alpha = .05$, power = 0.80) with a 20% non-response correction, 358 participants were recruited through stratified random sampling with strata defined by academic faculty and year of study.

Phase 2 Sampling (Qualitative)

Participants for the qualitative phase were purposively selected from Phase 1 respondents using criterion sampling (four or more ACEs endorsed) combined with maximum variation sampling to ensure diversity across gender, academic discipline, socioeconomic background, and outcome profile. Twenty-three participants were recruited, with sample sufficiency determined through thematic saturation [37]. Table 1 presents the participant matrix. Eight participants whose transcripts generated the primary thematic and theoretical contributions are profiled individually; the remaining fifteen are represented as a variation band (ACE types 4–15; CWA 44–65%), as their accounts contributed to saturation without introducing new theme structures. Verbatim extracts from this broader cohort are integrated into the thematic analysis where they extend or complicate the primary accounts.

Table 1. Phase 2 Participant Profile Matrix

Code	Gender	Year	Programme	ACE Types	CWA	CSSU	Profile
P03	Male	Year Four	Mining Engineering	15	44%	No	Very High ACE — impaired — non-help-seeker
P04	Male	Year Three	Minerals Engineering	16	49%	No	Very High ACE — impaired — non-help-seeker
P07	Female	Year Two	Economics & Industrial Organisation	12	50%	No	High ACE — recovering trajectory
P08	Female	Year One	Environmental and Safety	8	61%	Yes	Moderate ACE — positive trajectory

Code	Gender	Year	Programme	ACE Types	CWA	CSSU	Profile
			Engineering				
P11	Male	Year Three	Minerals Engineering	17	48%	No	Very High ACE — impaired — non-help-seeker
P15	Female	Year Three	Environmental and Safety Engineering	14	62%	Yes	Very High ACE — resilience case
P19	Male	Year Two	Computer Science and Engineering	13	57%	No	High ACE — moderate trajectory
P22	Male	Year Four	Geomatic Engineering	16	52%	No	Very High ACE — near-failed, recovering
P01–P02, P05–P06, P09–P10, P12–P14, P16–P18, P20–P21, P23	Mixed	Year One–Four	Multiple	4–15	44–65%	Mixed	Full variation matrix — saturation sample

Data Collection Instruments

Adapted ACE Questionnaire

Given the documented limitations of the standard 10-item ACE questionnaire in LMIC contexts [4, 21], an adapted instrument was employed extending beyond the original items to include: community violence, peer victimisation (including bullying), child labour, poverty-related neglect, orphanhood, and caregiver migration. The adaptation drew on the Center for Youth Wellness ACE Questionnaire [18] and the expanded taxonomy proposed by Finkelhor et al. [32], reviewed by a panel of five Ghanaian mental health practitioners and educational researchers for cultural appropriateness, and piloted with 30 undergraduate students at a comparable institution. The pilot produced a Cronbach's α of .81 for the full 25-item instrument, with item-total correlations ranging from .31 to .67; two items with marginal loadings were revised for clarity before main data collection. The final instrument demonstrated adequate internal consistency in the main sample ($\alpha = .84$).

The adaptation followed a structured, multi-stage cross-cultural adaptation procedure rather than ad hoc item addition. First, candidate items were generated from the source instruments [18, 32] and supplemented with adversities identified as locally salient in the Ghanaian and Tarkwa-Nsuaem mining context, namely community violence, child labour, poverty-related neglect, orphanhood, and caregiver migration arising from labour mobility. Second, items were forward-translated into Twi and independently back-translated into English by separate bilingual translators, with discrepancies reconciled by the research team to preserve conceptual rather than literal equivalence. Third, the five-member expert panel rated each item for relevance and cultural appropriateness;

items that did not meet the panel's agreement threshold were either reworded or removed, and this content-validity review determined the final 25-item pool. Fourth, the instrument was cognitively pre-tested during piloting with 30 students at a comparable institution to confirm that item wording was interpreted as intended, after which the two items with marginal item-total correlations were revised for clarity before main data collection.

Psychometric evaluation drew on both the pilot and main samples. Internal consistency was acceptable in the pilot (Cronbach's $\alpha = .81$; item-total correlations .31–.67) and in the main sample ($\alpha = .84$). Items were scored dichotomously (endorsed or not endorsed) and summed to a cumulative ACE count, consistent with the dose-response scoring convention of the original framework [29]. Because the adapted measure extends an established framework rather than introducing a wholly new construct, formal validation in this study was confined to content validity and internal-consistency evidence; criterion validation against an external trauma or distress measure, and full structural (dimensionality) validation, were beyond the present scope and are identified in the limitations as a priority for subsequent psychometric work. The full adapted item set is available from the corresponding author to support replication and independent appraisal.

Outcome and Protective Factor Measures

Phase 1 additionally administered: (a) the Kessler Psychological Distress Scale [45] for psychosocial well-being; (b) self-reported cumulative GPA and the University Student Engagement Inventory [50] for academic functioning; (c) the Brief Self-Control Scale [66] for self-regulation; (d) the Positive Childhood Experiences Scale [15]; and (e) the Multidimensional Scale of Perceived Social Support [69].

Semi-Structured Interviews

Phase 2 employed individual semi-structured interviews of 60–90 minutes, guided by an instrument developed directly from Phase 1 findings. Interviews were conducted in English or Twi according to participant preference, audio-recorded with consent, and transcribed verbatim. Transcripts were member-checked with a sub-sample of participants prior to analysis.

Data Analysis

Quantitative Analysis (Phase 1)

Descriptive statistics characterised ACE prevalence, type distribution, cumulative burden, and demographic variation. Multiple linear regression examined predictive relationships between ACE exposure and continuous outcome measures, controlling for demographic covariates. Latent Class Analysis (LCA) was conducted using Mplus version 8 [54] to identify distinct adversity profiles. Solutions ranging from two to six classes were estimated and compared on the Bayesian Information Criterion (BIC), sample-size adjusted BIC (SABIC), entropy, and the Lo–Mendell–Rubin likelihood ratio test, following standard practice for class enumeration [57]. Moderation analyses tested whether self-regulation and positive childhood experiences buffered the ACE–outcome relationship ($p < .05$; effect sizes reported as Cohen's f^2).

Qualitative Analysis (Phase 2)

Phase 2 data were analysed using Reflexive Thematic Analysis [16], following six phases: familiarisation with data, generating initial codes, constructing themes, reviewing themes, defining and naming themes, and producing the analytic report. A codebook was developed inductively from the data but informed deductively by the conceptual framework. Trustworthiness was enhanced through member checking with a sub-sample of six participants, an audit trail maintained in NVivo, and ongoing documentation in the researcher's reflexivity journal.

Integration of Phases

Integration occurred at two levels [30]. At the design level, Phase 2 interview protocols were developed in response to Phase 1 findings. At the interpretation level, quantitative findings and qualitative themes were synthesised using a joint display aligning statistical associations with corresponding qualitative accounts of the mechanisms underlying those associations. Research Question 5 was answered at this integration stage.

Ethical Considerations

Ethical approval was obtained from UMaT's Institutional Review Board and the Ghana Health Service Ethics Review Committee. Informed consent was obtained in writing from all participants, with explicit assurance that participation was voluntary and withdrawal carried no academic or institutional penalty. Anonymity was maintained through participant codes. A distress protocol was operational throughout data collection: all participants received a printed card with CSSU contact information and Ghana's national mental health helpline details. No data collected from a participant who withdrew after expressing acute distress were retained. Data were stored on encrypted institutional servers accessible only to named research team members.

PHASE 1: Quantitative Findings

Sample Characteristics

A total of 358 undergraduate students participated in Phase 1 (response rate: 86.1%). The sample comprised 265 males (74.0%) and 87 females (24.3%), consistent with UMaT's male-dominant enrolment profile; three participants (0.8%) identified as Other or preferred not to state their gender. Participants ranged in age from 18 to 30 years ($M = 23.7$, $SD = 3.8$). Year of study distribution was: Year One, 27.1% ($n = 97$); Year Two, 24.0% ($n = 86$); Year Three, 21.5% ($n = 77$); Year Four, 27.4% ($n = 98$). The majority of participants were supported financially by parents or guardians (57.0%) or relatives (9.5%), with 14.5% on scholarships and 16.5% self-supporting or on student loans. A substantial minority (28.8%) were in some form of employment alongside their studies.

ACE Prevalence and Burden (RQ1)

ACE prevalence was 83.8% ($n = 300$), with 56.7% of the sample reporting four or more ACE types endorsed and 16.5% reporting thirteen or more adversity types (Very High ACE burden). The most prevalent adversity types were: community violence (71.6%); economic hardship and poverty-related neglect (63.2%); parental conflict and intimate partner violence (54.7%); physical abuse (48.4%); caregiver emotional unavailability (44.2%); and parental separation or abandonment (39.5%). Sexual abuse was endorsed by 9.7% of participants. The expanded instrument items — community violence, child labour, and caregiver migration — were among the most frequently endorsed, confirming the inadequacy of the standard 10-item questionnaire for this population.

Significant variation in ACE burden was observed by year of study: Year Three students reported the highest mean ACE scores ($M = 6.8$, $SD = 5.5$), compared with Year One students ($M = 5.4$, $SD = 5.1$), suggesting either a cohort effect or the cumulative toll of unresolved adversity over time. Female students endorsed sexual abuse at significantly higher rates (15.8% vs. 5.3%, $\chi^2(1) = 14.67$, $p < .001$). LCA identified four distinct adversity profiles: (1) Low ACE (37.6%); (2) Household Dysfunction Dominant (24.2%); (3) Community-Ecological Dominant (21.3%); and (4) Polyvictimisation (16.9%), with the four-class solution offering superior fit ($BIC = 2,341.7$; entropy = .84).

Associations Between ACEs and Student Outcomes (RQ2)

Multiple linear regression analyses revealed statistically significant dose-response associations between ACE

burden and all primary outcome measures. Higher ACE exposure was significantly associated with lower CWA scores ($\beta = -.38$, 95% CI $[-.47, -.29]$, $p < .001$, $f^2 = .19$), elevated K10 distress scores ($\beta = .41$, 95% CI $[.32, .50]$, $p < .001$), reduced academic engagement ($\beta = -.29$, 95% CI $[-.38, -.20]$, $p < .001$), and lower self-regulation ($\beta = -.33$, 95% CI $[-.42, -.24]$, $p < .001$). These associations remained significant after controlling for age, gender, year of study, socioeconomic status, and academic faculty.

Very High ACE burden participants recorded mean CWA of 52.2% (SD = 7.5), compared with 59.2% (SD = 7.9) for Low ACE participants — a 7.0 percentage-point gap. Psychological distress was clinically elevated [26] in 61.2% of Very High ACE participants, compared with 12.3% of Low ACE participants. CSSU uptake was documented in 21.2% of the total sample, despite 83.8% ACE prevalence — a 62.6 percentage-point gap. Uptake was highest among Year Two students (29.1%) and lowest among Year One students (17.5%), with Year Three (19.5%) and Year Four (19.4%) showing comparable rates. Very High ACE burden participants had an uptake rate of 18.4%, suggesting a modest inverse relationship between need and service engagement.

Protective Factor Moderation (RQ3)

Self-regulation significantly buffered the negative association between ACE exposure and academic outcomes ($\beta = .24$ for the interaction term, $p = .003$), though this effect was partial. Positive childhood experiences moderated the ACE-K10 relationship ($\beta = -.19$, $p = .012$), and perceived social support moderated engagement outcomes ($\beta = .21$, $p = .008$). These protective effects were additive rather than multiplicative — no single protective factor fully neutralised the impact of Very High ACE burden.

PHASE 2: Qualitative Findings

Phase 2 semi-structured interviews were conducted with 23 participants purposively selected from Phase 1 respondents carrying elevated ACE burdens. Participants ranged from Year One to Year Four, with disciplinary representation across engineering, applied sciences, and management programmes. Five themes were identified through Reflexive Thematic Analysis. Each is illustrated with verbatim extracts drawn from multiple participants; the analytic narrative integrates accounts across the dataset rather than relying on any single case.

Several of the analytic categories reported below are inductively derived constructs rather than established scale-based variables, and each is operationally defined at the point of first use to support transparency and replication. In brief: invisible labour denotes the cognitive and emotional effort expended on managing concurrent adversity that is not captured by, and therefore depresses, formal academic assessment; dissociative-adjacent cognitive disruption is defined in Theme 3; reactive defiance denotes an adversarial, affect-driven refusal to be defeated that functions as a short-term motivational resource distinct from hope or relational support; and cultural-experiential distance denotes a perceived gap between the lived experience of the help-seeker and that of the counsellor that operates as a relational barrier to service engagement. These constructs were generated from, and are evidenced against, the interview data rather than imported from prior instruments; their relationship to existing standardised measures is treated as an open empirical question in the limitations.

Theme 1: Normalised Adversity and Ecological Embedding

The most consistent finding across interviews was the extent to which participants had internalised childhood adversity as an unremarkable feature of life — not as exceptional trauma, but as the ordinary condition of their social world. This normalisation was not a cognitive defence strategy in the clinical sense; it reflected genuine epistemic constraint. Participants consistently described coming from communities in which the conditions generating adversity were near-universal, making deviation from that baseline imperceptible from within it.

P04, a Year Three Minerals Engineering student from Tarkwa, expressed this directly:

"I thought it was the way life was everywhere. I genuinely thought — this is what adult life looks like. Conflict over resources. People getting hurt. Men drinking because there's no other way to manage the pressure. I didn't know that other children were growing up differently. You can't miss something you don't know exists." (P04)

P11, also from Tarkwa in Year Three Minerals Engineering, offered an account with the same structure but different content — hunger during childhood attributed to personal failing rather than systemic poverty:

"There were times I went to school hungry and sat in class trying to follow what the teacher said. I didn't know then that hunger affected concentration. I thought I just wasn't smart enough on those days." (P11)

This cognitive misattribution — reading the consequences of structural deprivation as personal deficiency — was present across multiple interviews and carries significant implications for measurement validity. Participants who have normalised adversity may systematically underreport on ACE instruments that presuppose deviation from a non-adverse baseline, suggesting that even the high prevalence figures documented in Phase 1 (83.8%) likely represent conservative estimates. For P03, a Year Four Mining Engineering student who grew up in Bogoso following his father's death in a site accident, the normalisation extended to bereavement itself: the absence of space to grieve because the immediate economic emergency consumed everything is described not as a compound loss but simply as "how it was."

The ecological specificity of this normalisation was salient. P04's account situated adversity within the distinctive socioecological context of the Tarkwa-Nsuaem mining economy — commodity price volatility transmitted directly into household tension, community violence arising from galamsey disputes, and the contraction of safe social space. P22 described an equivalent contraction in Prestea — a community curfew imposed during chieftaincy and mining disputes when he was in secondary school: "You couldn't be outside after dark. For two months. I learned to read violence the way you learn to read weather." His account illustrates the chronosystemic accumulation of adversity that Bronfenbrenner's framework predicts but quantitative instruments rarely capture.

Theme 2: Invisible Labour and the Performance Gap

Across interviews, a consistent disjunction emerged between participants' self-assessed intellectual capability and their formal academic records. Participants repeatedly and precisely articulated the mechanisms through which unresolved adversity had impeded academic performance — not through lack of knowledge or effort, but through the hidden expenditure of cognitive and emotional resources on adversity-adjacent burdens that were invisible to the academic assessment system.

The theme was most extensively articulated by P04 in the context of his father's mining accident during Year Two examinations:

"The marks look the same as anyone else's marks. But they are not the same." (P04)

P11's project supervisor had described his analytical work as "among the best he's seen in his career at UMaT." P11 reflected on the contradiction this created:

"Forty-eight percent and among the best he's seen. Both things are true. That is not a small contradiction. That is the whole problem, in one sentence." (P11)

P07, a Year Two Economics and Industrial Organisation student, framed the gap in terms of what assessment instruments cannot see:

"Nobody looks at a fifty and asks 'What happened to her?' They look at it and think — this one is weak. The number does not see me back." (P07)

P03 drew the same boundary from the other side: "My CWA is forty-four percent... Every semester I have been managing something that is not visible in that number. The number does not know that I worked thirty hours last week. It does not know about my father. It just is what it is. A number with no context." The convergence of these accounts across participants with different adversity histories, programmes, genders, and year groups establishes the invisible labour thesis as a robust cross-participant pattern, not an idiosyncratic observation. The policy implications are direct: CWA as currently constructed measures performance under conditions, not capacity absent those conditions.

Theme 3: Conditioned Hypervigilance and Its Academic Consequences

A third theme emerged from participants' accounts of how academic functioning was disrupted not by conscious worry or distraction, but by involuntary somatic and cognitive responses triggered by evaluative academic environments. Two analytically distinct but mechanistically related sub-themes were identified: involuntary cognitive disruption in evaluative settings, and deliberate but adversity-conditioned evaluative avoidance.

Sub-theme: Involuntary Cognitive Disruption Under Evaluative Pressure

Three distinct phenomenological variants of this disruption were identified across the dataset, each independently reported without prompting.

P04 and P11 — both male, both in Minerals Engineering, both from Tarkwa mining backgrounds — independently described the same mechanism of time-loss during examinations, using strikingly similar language. P04:

*"When I'm sitting in an examination hall and the invigilator walks past — something about the footsteps, the authority of the person, the silence and the **pressure — it takes me somewhere. Not anywhere specific. Just — somewhere uncomfortable. And I come back, and minutes have passed, and I have not written anything." (P04)*

P11, without having been asked about examinations specifically:

"When I sit in that hall and the invigilator is walking around... My mind goes somewhere else. Not blank — it goes back. I don't know where. And I come back and time has passed. I've lost fifteen, twenty minutes. Afterwards I can answer every question. But in the moment I just — I leave." (P11)

The independent convergence of these accounts across two different participants substantially strengthens the evidential basis for this mechanism. Notably, P04 spontaneously connected the experience to his early adversity history; P11 made the connection only when asked directly — and named it as new insight: "Maybe there is something similar. I hadn't connected that before." The partial nature of P11's connection is itself analytically significant: the mechanism operates whether or not the individual has cognitive access to its origin.

P07 described a distinct but structurally related variant: an examination freeze — not time-loss but a five-minute seizure at the start of every assessment — which she had partially reduced through self-management strategies but not eliminated. P03 described intrusive imagery under examination pressure — "flashes" of his father's accident and his mother's notification — that required active suppression, consuming the cognitive resources

examination performance requires. These three variants — time-loss, freeze, intrusive imagery — are phenomenologically distinct but mechanistically related: each represents an involuntary re-allocation of cognitive resources away from the examination task and toward threat-processing rooted in early adversity.

For analytic clarity, the umbrella construct linking these three variants is termed dissociative-adjacent cognitive disruption and is operationally defined as an involuntary, evaluation-triggered re-allocation of attentional and working-memory resources away from the academic task and toward threat-related processing, manifesting as time-loss, cognitive freezing, or intrusive trauma-related imagery during assessment. The qualifier “-adjacent” is deliberate: these phenomena were identified through Reflexive Thematic Analysis of participants’ first-person accounts rather than through a standardised dissociation instrument or structured clinical interview, and they are therefore not equated with a diagnosable dissociative disorder under DSM-5-TR or ICD-11 criteria. The construct denotes experiences that resemble, but were not clinically assessed against, formal dissociation; it functions as an interpretive, data-grounded category, and establishing its measurement alignment with validated dissociation scales (for example, the Dissociative Experiences Scale) is identified in the limitations as a direction for future research.

Sub-theme: Evaluative Avoidance and Pre-emptive Withdrawal

A second and structurally related but phenomenologically distinct manifestation of conditioned hypervigilance emerged in the form of deliberate but adversity-conditioned withdrawal from evaluative social environments. Unlike the involuntary dissociative disruptions described above, this pattern reflects a semi-conscious avoidance strategy that was adaptive under conditions of unpredictable threat but carries direct academic costs in higher education.

P04 described it in collaborative learning contexts — a behavioural consequence of exposure to unpredictable parental conflict:

“Sometimes in a group project when there’s disagreement I just — I let other people lead even when I know they are wrong, because I cannot make myself stay in that space.” (P04)

P07 described the same mechanism in her reluctance to raise her hand in lectures: “You don’t expose yourself when you’ve learned that exposure gets used against you.” P19 named it as pre-emptive withdrawal: “When I feel I might be judged and found wanting, I stop contributing in seminars... Because if you don’t try, you can’t be found inadequate.”

Whereas the dissociative variants in sub-theme 7.3.1 operate below the threshold of conscious choice, evaluative avoidance involves a learnt, semi-conscious decision to withdraw before being found wanting. Together, both sub-themes illustrate how the same ecological antecedent — chronic threat exposure in childhood — produces both involuntary and volitional forms of academic disengagement, each carrying direct consequences for participation, group work contribution, and the intellectual contestation that higher education requires.

Theme 4: Reactive Defiance as a Contextually Grounded Resilience Mechanism

Existing resilience literature foregrounds hope, mentorship, spirituality, and secure attachment as the primary buffers against ACE-related adverse outcomes. While these were present in the interview dataset, a fourth and analytically distinct resilience mechanism emerged that is not well-theorised in existing frameworks: a reactive defiance characterised not by optimism or relational support but by an adversarial refusal to be overcome. P04 named it explicitly:

“I will not give this situation the satisfaction of defeating me. That’s different from hope. Hope is nice. This is more like anger, directed productively.” (P04)

P03 articulated the same mechanism in structural terms: "I have no choice. Going back is not an option... So I go forward because there is nowhere else to go. That is not inspiration. That is just — the wall behind me is too close." P22 described the shift to refusal as a specific developmental moment: "Something about being back on campus in Year Two felt different because I'd decided — I will not become what I'm watching. That's not inspiration, exactly. It's more like refusal."

This mechanism was salient across male participants from mining-community backgrounds — precisely the population for whom conventional resilience resources (mentorship, institutional support, therapeutic engagement) were least accessible. The construct has partial antecedents in the literature. Tedeschi and Calhoun's (2004) post-traumatic growth framework describes adversity as generating new possibilities, but foregrounds meaning-making and cognitive restructuring rather than refusal. Spencer's (2006) Phenomenological Variant of Ecological Systems Theory (PVEST) documents identity-protective coping among marginalised youth, and resistance-based coping has been documented in African American adolescents facing structural adversity [14]. What distinguishes reactive defiance in this dataset is its affective register — not growth, not identity assertion, but an adversarial refusal that functions as fuel rather than resolution — and its explicit temporality, acknowledged by participants themselves as unsustainable beyond the early years of study. P04 himself identified its temporal limitation with precision:

"In Year One and Year Two you can run on stubbornness. By Year Three you realise you need something more sustainable. And I don't always have that." (P04)

This temporal dimension of resilience depletion is analytically significant. It suggests that reactive defiance may explain the relative stability of Year One and Year Two academic trajectories among high-ACE participants, followed by the steeper decline observed in Year Three and Year Four in the Phase 1 CWA data — a pattern consistent with Masten's [51] distinction between short-term persistence and sustainable adaptive functioning.

Spirituality constituted a secondary resilience resource across the dataset, though its function varied. P15 described prayer as active orientation: "A way of saying: this matters, I am here, let me be present." P11 described church attendance as the one campus space free of performance measurement. P22's church group off campus provided social normalcy. The register in each case is one of emotional regulation and relational grounding rather than the cognitive meaning-making through religious belief that the resilience literature tends to emphasise [28, 60].

P15 introduced a resilience mechanism not present in other accounts: naming — the acquisition of language for adversity through a psychology elective in Year Two:

"The lecturer was explaining trauma and the body. I thought: I know this. I have been living this. And for the first time I had language for it. I stopped thinking there was something wrong with me and started thinking something happened to me. Those are different things." (P15)

This transition from self-pathologising to contextual understanding — enabled by formal psychological education — functioned as a protective reframing that reduced the internalised shame associated with adversity and its consequences. It is the most theoretically significant resilience mechanism in the dataset that diverges from existing frameworks: it is neither relational nor spiritual nor regulatory, but epistemic. It complicates the multifinality principle by suggesting that access to psychological literacy may explain divergent outcome trajectories among students with equivalent ACE burdens.

Theme 5: A Four-Tier Help-Seeking Barrier Model

Phase 1 documented a 62.6 percentage-point gap between ACE prevalence (83.8%) and CSSU uptake (21.2%), with the inverse relationship between need and service engagement constituting the most immediately actionable

policy finding of the quantitative phase. Phase 2 qualitative data provided a detailed phenomenological account of this gap, with participants articulating not a single monolithic barrier to help-seeking but a sequenced, mutually reinforcing four-tier model — the fourth tier emerging from the dataset only through cross-participant analysis.

The first tier is physical visibility and stigma. Participants across year groups and genders described the CSSU's location — proximate to the administration building — as a primary deterrent. P04: "If I walk into the counselling unit, someone I know will have seen me walk in. And then — the story starts before anything has even been said inside." P07 expressed the same concern with specific reference to gendered judgment: "I'm already someone who is perceived as managing. If people knew I was struggling — it would change how they see me." The visibility barrier was mentioned by every participant who had not accessed the CSSU, regardless of year group or discipline, indicating its universality as a structural deterrent.

The second tier is institutional trust and data confidentiality. P22 articulated this most precisely, distinguishing between verbal assurance and structural certainty:

"I don't know what they do with what you tell them. Does it go somewhere? Does someone see a file? In Year One, if I'd gone and said 'I'm drinking too much and I'm not okay,' what would have happened? Would there have been a welfare flag on my record? I don't know." (P22)

P19 had heard a secondhand account of the CSSU from a friend who attended once and never returned: "He said it felt like a clinical thing — like they were looking for symptoms. And that put me off. I don't want to be looked at like a case. I want someone who sees me as a person who is also having symptoms, in that order." The sequencing — person before problem — was named independently by P19, P04, and P15, constituting one of the dataset's most operationally specific service design principles.

The third tier is the symbolic meaning of help-seeking as concession of independence. P04 named the irrationality of this barrier whilst reporting its continued force: "For someone who has managed alone for so long, that feels like a defeat. That's irrational — I know it's irrational. But the feeling is there." P03's formulation was more defiant: "Maybe I'm afraid they'll confirm what I suspect — that what I'm carrying is too heavy for this kind of support. Or maybe worse — that it's not heavy enough and they'll send me away with a pamphlet. Both possibilities feel bad." The self-aware recognition of irrationality — present in P04, P03, and P22 — confirms that mental health literacy does not by itself predict help-seeking behaviour. The barrier is identity-level and operates even when participants possess the cognitive framework to recognise it as such.

The fourth tier — emerging only through cross-participant analysis — is cultural-experiential distance. P11 named a barrier not reducible to visibility, confidentiality, or identity: a perceived gap between the counsellor's probable life experience and his own:

"I suppose the honest reason is — I don't think they'd understand... There's knowing the theory and there's knowing what it feels like when the soup has no fish because the gold price dropped." (P11)

P11 immediately qualified this: "If they are honest that they don't know, and ask me to teach them — that I could work with." This formulation is significant: the fourth barrier is not insurmountable, but it requires the counsellor to actively signal epistemic humility and contextual curiosity rather than assumed competence. It extends the help-seeking barrier model beyond structural and identity factors into the relational and cultural domain — and connects directly to the co-design vision participants articulated for an ideal service.

Importantly, the dataset also contains a positive CSSU encounter: P08 (Year One, moderate ACE burden) attended the CSSU in her second month at UMaT. She described the elements that enabled engagement: a female counsellor, unhurried attention, absence of clinical formality in the first encounter, and a focus on the immediate ("what happened this week") rather than the comprehensive ("your whole history"). P15 similarly described her

single CSSU contact in Year Two as having prioritised the immediate before the historical. Taken together, these accounts do not merely identify barriers — they constitute a participant-generated service design specification: lower the access threshold, relocate the service, offer anonymous initial contact, train for epistemic humility, and begin with today.

INTEGRATION: Meta-Inferences Addressing Research Question 5

Integration was achieved at both design and interpretation levels [30]. Phase 2 interview protocols were developed in direct response to Phase 1 patterns. At the interpretation level, quantitative findings and qualitative themes were synthesised in the joint display presented as Table 2, producing four meta-inferences that constitute the study's primary integrative contribution.

Table 2. Joint Display: Phase 1 Statistical Findings and Phase 2 Qualitative Explanations

Phase 1 Statistical Finding	Phase 2 Mechanism (Qualitative)	Meta-Inference
Very High ACE burden associated with CWA 7.0 percentage points below Low ACE peers ($\beta = -.38$, $p < .001$)	Dissociative-adjacent cognitive disruption in evaluative settings (three phenomenological variants: time-loss, freeze, intrusive imagery); invisible labour of concurrent crisis management; conflict-avoidance reducing collaborative learning participation	The CWA gap does not reflect differential intellectual capacity; it reflects the measurable academic cost of unaddressed adversity assessed by instruments blind to the conditions under which performance is produced. This is an equity problem, not a performance problem.
CSSU uptake 21.2% despite 83.8% ACE prevalence; modest inverse relationship with ACE burden (Very High ACE: 18.4%)	Four-tier barrier model: visibility → confidentiality uncertainty → identity-level resistance to help as concession → cultural-experiential distance. Barriers are sequenced and mutually reinforcing.	Low uptake is not apathy. It is the product of a specific barrier architecture operating across structural, psychological, and relational dimensions. Addressing visibility alone is necessary but insufficient; all four tiers require intervention, in sequence.
Self-regulation moderated ACE-outcome relationship ($\beta = .24$, $p = .003$) but did not neutralise Very High ACE effects; CWA declined by year of study	Reactive defiance as primary resilience mechanism — temporally limited, depleting by Year Three; epistemic naming as an additional mechanism not measured by BSCS; spirituality as emotional regulation rather than meaning-making buffer	Resilience in this population is not primarily individual-cognitive as Western models foreground. It is reactive-ecological and epistemic. It depletes across time in ways consistent with the Phase 1 year-of-study CWA gradient.
Very High ACE burden associated with clinically elevated	Distress experienced as chronic diffuse background noise rather than acute episode; financial precarity as ecological continuation of childhood	Elevated K10 scores in this population index a chronic adaptation to adversity rather than acute psychiatric disorder. Intervention models premised on acute presentation and self-referral

Phase 1 Statistical Finding	Phase 2 Mechanism (Qualitative)	Meta-Inference
psychosocial distress in 61.2% of participants vs. 12.3% Low ACE	adversity; distress managed through isolation and functional withdrawal, not help-seeking	will systematically miss the population carrying the greatest burden.

These four meta-inferences produce insights that neither quantitative nor qualitative analysis could independently generate. Because the design is cross-sectional, these meta-inferences are advanced as interpretive, theory- and participant-informed accounts of how adversity and outcomes are related, not as causal claims; the verbs of explanation used below should be read in that interpretive sense. The first reframes the CWA gap from a performance problem to an equity problem. The second converts the uptake gap from a system success story to a system failure story and provides a specific, participant-derived architectural account of why. The third introduces reactive defiance and epistemic naming as resilience mechanisms not captured by the BSCS, partially re-interpreting the Phase 1 moderation finding. The fourth repositions the K10 findings within a framework of chronic adaptation, with direct implications for service design and outreach strategy. One productive tension between the phases warrants explicit acknowledgement. The qualitative data generate a strong narrative of inverse relationship between ACE burden and help-seeking — the most distressed students as the furthest from support. Yet the Phase 1 data show Very High ACE burden participants at 18.4% CSSU uptake, only marginally below the overall rate of 21.2% and above the Low ACE group in some analyses. Two interpretations are possible and both may be partially correct. First, uptake figures capture any contact with the CSSU, however brief, and may not distinguish between meaningful engagement and a single visit that did not lead to continued support — consistent with P15’s account of one visit that was helpful precisely because it was not clinically demanding. Second, the qualitative sample was selected for elevated ACE burden, which may have over-represented the sub-population for whom barriers are most salient; the quantitative sample captures the fuller distribution. Rather than resolving this tension by privileging one dataset, the integration holds it open as a substantive finding: the barrier model identifies the mechanism, while the uptake figures indicate that a minority of Very High ACE students do engage with the CSSU under the right conditions. The policy implication is not that the service has failed entirely, but that its reach is structurally constrained in ways the four-tier model explains.

DISCUSSION: IMPLICATIONS AND CONCLUSION

Taken together, the findings reframe two institutional metrics that are ordinarily read as indicators of student deficiency. The cumulative weighted average gap between high- and low-ACE students is reinterpreted as an equity signal — the measurable academic cost of unaddressed adversity assessed under conditions the instrument cannot see — rather than as evidence of differential ability. Likewise, the gap between ACE prevalence and counselling uptake is reinterpreted as the product of a sequenced, four-tier barrier architecture rather than as student apathy. The practical implication is that trauma-informed reform at UMaT, and in comparable Ghanaian institutions, should target the assessment-equity and service-access systems directly: relocating and destigmatising the counselling service, clarifying confidentiality, training counsellors for epistemic humility and contextual curiosity, and proactively reaching the Year Three and Year Four students whose trajectories the data show to be most at risk.

Limitations

Several limitations qualify these conclusions. First, the quantitative phase employed a cross-sectional design, which precludes causal inference. The dose-response associations reported in Phase 1, and the mechanistic accounts developed through integration in Phase 2, should therefore be read as patterns of association and as

participant-articulated, abductively reasoned interpretations rather than as demonstrated causal pathways. Where the integration describes adversity as producing or explaining academic and psychosocial outcomes, the language reflects the explanatory logic participants themselves advanced and the theoretical model guiding the study; it does not establish temporal precedence or causation, and reciprocal pathways — for example, current academic difficulty shaping the retrospective recall of adversity — cannot be excluded.

Second, academic achievement was indexed by self-reported cumulative weighted average and self-reported GPA rather than by official institutional transcripts. Although self-reported and recorded academic performance are generally well correlated, self-report introduces potential reporting error and social-desirability bias, and the present estimates of the ACE–attainment association would be strengthened by linkage to verified academic records. Relatedly, ACE exposure and psychosocial outcomes were measured through retrospective self-report, which is subject to recall bias and, as Theme 1 indicates, to systematic under-reporting where adversity has been normalised; the 83.8% prevalence figure is therefore likely a conservative estimate.

Third, validation of the adapted ACE instrument was confined to content validity and internal-consistency evidence; criterion validation against an external trauma or distress measure, and full structural (dimensionality) analysis, were beyond the scope of this study, and the instrument’s psychometric profile should accordingly be regarded as provisional. The inductively derived qualitative constructs — most directly dissociative-adjacent cognitive disruption — were likewise grounded in the interview data rather than aligned with validated standardised measures. Fourth, all three authors hold institutional roles within the CSSU; although the positionality mitigation strategies described in Section V were applied and their effects documented in the reflexivity journal, residual social-desirability and demand effects in participants’ accounts of institutional support cannot be fully eliminated. Fifth, the study was conducted at a single specialist, male-dominant technical university embedded in a distinctive mining economy; while this specificity is analytically valuable, it constrains statistical generalisation to other Ghanaian and sub-Saharan institutions, and the findings are therefore offered as analytically rather than statistically generalisable.

Directions for Future Research

These limitations indicate clear priorities for future research. Longitudinal and prospective cohort designs are needed to establish the temporal ordering and causal status of the associations observed here, particularly the year-of-study decline in attainment that the reactive-defiance depletion hypothesis predicts. Future studies should incorporate objective academic records in place of, or alongside, self-reported performance, and should pair the adapted ACE instrument with validated measures of dissociation, distress, and self-regulation in order to test the construct alignment of the inductively derived categories proposed here. Multi-site replication across diverse Ghanaian institutions, together with dedicated psychometric studies establishing the criterion and structural validity of the adapted instrument, would further strengthen the evidence base for trauma-informed reform in African higher education.

Conclusion

In conclusion, this mixed-methods study documents a high burden of adverse childhood experiences among undergraduates at UMaT and links that burden to measurable, patterned differences in academic attainment, psychosocial distress, and service engagement. Its principal contribution is integrative: it situates statistical associations within participants’ own accounts of the mechanisms connecting early adversity to present functioning, and in doing so reframes two institutional metrics — the attainment gap and the counselling-uptake gap — as questions of equity and access rather than of student deficiency. Read within the limits of a cross-sectional, single-institution design, the findings provide an empirically grounded and contextually specific basis for trauma-informed counselling, assessment, and student-support reform across Ghanaian higher education.

ETHICAL APPROVAL

Ethical approval was obtained from the Institutional Review Board of the University of Mines and Technology, Tarkwa (UMaT-IRB) and the Ghana Health Service Ethics Review Committee. All participants provided written informed consent. Participant anonymity was maintained through coded identifiers throughout data collection, storage, and reporting.

CONFLICT OF INTEREST

The authors declare no conflict of interest. All three authors hold institutional roles within the Counselling and Student Support Unit at UMaT. This dual positioning was explicitly addressed as a positionality consideration and managed through the mitigation strategies described in Section V.

DATA AVAILABILITY

Anonymised quantitative data supporting the findings of this study are available from the corresponding author upon reasonable request. Qualitative interview data are not publicly available due to the sensitive nature of participant disclosures and the terms of the ethics approval under which they were collected.

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