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Mental health of palestinian undergraduates during the War on Gaza: a cross-sectional study on PTSD, CPTSD, and psychological distress

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Armed conflicts severely impact civilian mental health, with prolonged exposure linked to complex trauma presentations. This cross-sectional study investigated the prevalence of post-traumatic stress disorder (PTSD), complex PTSD (CPTSD), and psychological distress among 819 Palestinian undergraduate students across West Bank universities during the Gaza war. Data were collected between February and April 2024 using an online survey that included the International Trauma Questionnaire (ITQ; ICD-11 criteria) and the General Health Questionnaire-12 (GHQ-12). Associations between conflict exposure variables and mental health outcomes were analyzed using non-parametric statistics and multinomial logistic regression. Mental health conditions were highly prevalent: 87.2% (95% CI: 84.7–89.4%) reported psychological distress, and 51.9% met criteria for a PTSD diagnosis, with 25.5% classified as PTSD-only and 26.4% as complex PTSD. Disturbances in self-organization were present in 38.6% of participants. Female students exhibited greater PTSD symptom severity compared to males (median = 12 vs. 10, $p < 0.001$). Multinomial logistic regression revealed that crossing four or more military checkpoints was associated with over three-fold higher odds of both PTSD-only (AOR = 3.66) and CPTSD (AOR = 3.42), while prior mental health diagnoses specifically predicted CPTSD (AOR = 2.07) but not PTSD-only. Religious coping was predominant (90.4%), yet only 2.6% had accessed professional mental health services. These findings reveal a substantial mental health crisis among Palestinian university students, underscoring the need for expanded, culturally sensitive, and context-based mental health interventions within universities.

Keywords PTSD, Complex PTSD, Trauma, Palestinian students, Conflict exposure, Mental health, Distress, Checkpoints

Abbreviations

PTSD	Post-traumatic stress disorder
CPTSD	Complex post-traumatic stress disorder

Warfare remains one of the most destructive human experiences and has a long-term consequence on the mental health of civilian populations[1]. A systematic review and meta-analysis study estimated that within the conflict-affected populations, 22.1% had experienced a mental disorder at some point, such as depression, anxiety, post-traumatic stress disorder, bipolar disorder, or schizophrenia[1]. Research in long-standing conflict zones such as Syria, Afghanistan, and Ukraine consistently highlights the lifelong mental health toll of war[2–4]. For instance,

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over half of the Ukrainian adults in 2022 reported experiencing symptoms of mental distress, with 54% suffering from anxiety and 47% from depression[4,5].

In the occupied Palestinian territories, decades of ongoing and prolonged political and military occupation have subjected the Palestinians to cumulative traumatic experiences due to widespread political violence, including the loss or injury of loved ones, personal injury, repeated displacement, destruction of buildings, or witnessing assaults[6,7]. This chronic exposure to political violence has severely affected the mental health of Palestinians, leaving individuals experiencing elevated rates of psychological distress and posttraumatic stress disorder (PTSD)[6,7]. Since the beginning of the latest war, an estimated 45,057 individuals have been killed between 7 October 2023 and 17 December 2024 in the Gaza Strip, 107,041 reported injured, and 1.9 million (90% of the population) were displaced, with widespread destruction of civilian infrastructure[8,9]. Recent findings show that 67.9% of displaced adults in the Gaza Strip have PTSD symptoms according to DSM-5 criteria, with 79.3% and 84.5% of participants reporting moderate to severe levels of anxiety and depression, respectively[10].

The West Bank, even if it is not directly bombarded, faces severe psychological impacts due to state violence, military invasion, movement restrictions, inspections at checkpoints, and mass arrests[11]. Following the war in October 2023, 770 deaths and 6,913 injuries were reported in the West Bank by November 2024 [12]. This conflict has also led to exacerbated movement restrictions, increased economic strain, and heightened psychological distress, all of which have severely disrupted healthcare services[11].

In the West Bank, university students face both direct and indirect stressors[13,14]. The extremely challenging environmental conditions have prevented many Palestinian students from accessing their universities across the West Bank; thus, they conduct online education as an alternative[14]. Adverse stressors, such as school closures, displacement, educational disruptions, and broken routines, can overwhelm student's sense of stability, increase anxiety and perceived helplessness, placing them at heightened risk for post-traumatic stress disorder[13]. Conversely, some students are required to attend the university campus for clinical or laboratory instruction and thus frequently navigate Israeli checkpoints established to control Palestinian movement. These checkpoints result in prolonged delays and disrupt students' daily routines while eliciting feelings of fear, humiliation, insult, and oppression[15,16].

Beyond direct violence, it is important to consider the potential mental health impact of exposure to war news through media content[17,18]. Even indirect exposure via news and social media can trigger anxiety, uncertainty, distress, and PTSD in observers[19]. Palestinian students witnessed traumatic media coverage of the violence in Gaza, such as graphic news of bombings and civilian casualties, which indirectly undermined their emotional well-being and academic concentration[13]. Unlike their peers in neighboring countries (e.g., Jordan or Lebanon) who watch the Gaza war from afar, West Bank students experience these events as personal trauma. Gaza is part of their homeland, so attacks there mean their own friends and relatives are in danger, evoking intense fear and grief beyond what distant observers might feel.

Post-traumatic stress disorder (PTSD), as defined by the eleventh version of the International Classification of Diseases (ICD-11), is a mental disorder that individuals develop after being exposed to an extremely life-threatening event, such as war, sexual assault, or natural disasters[20]. Core symptoms include re-experiencing the trauma in the form of flashbacks or nightmares, avoidance of trauma-related stimuli, and a persistent sense of current threat[20]. Complex PTSD (CPTSD) represents a distinct diagnostic category under ICD-11[21,22]. It is specifically associated with exposure to prolonged, repeated, or inescapable traumatic events, such as torture, slavery, domestic violence, or war atrocities[21,22]. In addition to the core symptoms of PTSD, CPTSD is characterized by disturbances in self-organization (DSO): affective dysregulation (emotional instability and outbursts), negative self-concept (feelings of worthlessness, guilt, or failure), and interpersonal difficulties (chronic problems in forming or maintaining relationships)[21,22].

Understanding the mental health impact of the Palestinian context requires theoretical frameworks that go beyond conventional trauma models. Traditional PTSD frameworks assume that trauma is a past event from which individuals are recovering; however, the continuous traumatic stress (CTS) model proposed by Eagle and Kaminer (2013) recognizes that in settings of ongoing political violence, individuals are simultaneously coping with past trauma while facing continued and anticipated threat[23]. This framework is highly applicable to Palestinian students, who are not recovering from a single traumatic event but rather navigating daily exposure to military checkpoints, raids, and the ever-present threat of escalation. Additionally, university students fall within the developmental stage of emerging adulthood (ages 18–25), a period characterized by identity formation, growing autonomy, and relational development[24]. When these normative developmental tasks are disrupted by chronic conflict, young adults may be at heightened risk for complex trauma responses.

In addition to trauma symptoms, psychological distress is an essential construct in assessing mental health in conflict zones. The General Health Questionnaire-12 (GHQ-12) is one of the most popular instruments used to assess psychological distress among both community and clinical populations[25,26]. Due to the tool's short nature and intercultural applicability, it has proven particularly useful in humanitarian and conflict contexts, including communities using the Arabic language[25–27].

Although PTSD has been relatively well-studied in Palestinian populations, CPTSD and DSO remain critically underexplored, especially among university students. This research gap is concerning, given the repeated and prolonged nature of the trauma experienced in the region. Moreover, despite the examination of the mental health of college students during the recent war, none to date have assessed for symptoms of CPTSD or psychological distress, nor have any included all the major universities in the West Bank. Therefore, this study aims to examine the prevalence of ICD-11 PTSD and CPTSD, and psychological distress among undergraduate students in the West Bank during the 2023–2024 wartime. Additionally, the study investigates the associations of these mental health outcomes with demographic factors, as well as conflict-related experiences. Our findings aim to inform mental health policymakers and university services, urging the inclusion of tailored psychological support for Palestinian undergraduates during and after armed conflict.

Methods

Study design and setting

This cross-sectional study employed a quantitative approach to examine mental health outcomes among Palestinian undergraduate students during the 2023–2024 Gaza conflict. Data collection occurred between February 10 and April 6, 2024, corresponding to approximately 4–6 months after conflict onset, when initial acute stress responses may have stabilized into more persistent psychological patterns. The study was conducted across multiple universities in the West Bank, Palestine, selected to ensure geographical representation across different governorates. The primary target institutions included: Al-Quds University (Jerusalem), Birzeit University (Ramallah and Al-Bireh), Al-Najah University (Nablus), Bethlehem University (Bethlehem), Arab American University (Jenin), Palestine Polytechnic University and Hebron University (Hebron). Additional participants were recruited from other accredited universities in the region to enhance sample representativeness.

Participants and eligibility criteria

We targeted Palestinian undergraduate students enrolled in recognized universities in the West Bank. Eligibility for participation in this study was determined based on specific inclusion and exclusion criteria. To be included, individuals had to be currently enrolled as undergraduates, aged between 17 and 26 years, of Palestinian nationality, able to read and comprehend Arabic, and willing to provide informed consent. Participants were excluded if they were postgraduate students, on academic leave or suspension, or if they submitted incomplete survey responses.

Sampling strategy and sample size calculation

A two-stage sampling approach was employed to ensure representative coverage across the West Bank. First, seven major universities were purposively selected using cluster sampling based on geographical distribution and student enrollment size. Second, convenience sampling was employed within each university based on student availability and willingness to participate. While the resulting sample was predominantly female (75.1%), this partially reflects the gender composition of Palestinian university enrollment. The overrepresentation is also consistent with the higher response rate of women in health surveys[28].

Sample size calculation

Based on Palestinian Ministry of Higher Education enrollment data indicating approximately 65,000 students across target universities. The sample size was calculated using the OpenEpi online calculator for cross-sectional studies with an assumed PTSD prevalence of 50%, 95% confidence level, and 5% margin of error, yielding a minimum required sample of 382 participants. However, to enhance statistical power and representativeness, we aimed to recruit 850 participants.

Data collection

Data were collected through a structured, self-administered online questionnaire developed using Google Forms, selected due to the shift toward online education during the conflict and to ensure participant safety and accessibility. Formal agreements were established with university administrations for email distribution through official university systems, with additional recruitment occurring through university Facebook groups and student organizations, where participants were encouraged to share the survey with eligible peers. Survey completion time averaged 15–20 min, with technical support available via email for participants experiencing difficulties.

A total of 892 responses were received. After excluding 37 pilot study participants, 22 incomplete responses, and 14 participants who did not meet inclusion criteria, the final analytical sample comprised 819 participants. The exact response rate could not be calculated, as the survey was distributed through multiple overlapping channels (institutional emails, university social media pages, and student organizations), precluding a reliable estimate of the total number of students reached.

Measures and instruments

The questionnaire contained two main sections: demographic information and standardized mental health assessments.

Sociodemographic and conflict-related variables: A comprehensive questionnaire assessed demographic characteristics, including age, gender, university affiliation, place of residence, academic major, year of study, and socioeconomic status. Conflict-related variables included economic impact assessment (whether current conflict negatively affected family economic situation), number of military checkpoints crossed regularly, exposure to violence, and access to mental health services.

Standardized Instruments

International trauma questionnaire (ITQ): The ITQ is an 18-item self-report instrument developed to assess PTSD and Complex PTSD (CPTSD) symptoms in accordance with the ICD-11 criteria[29]. The scale covers two subscales. First, PTSD subscales have three symptom clusters measuring re-experiencing (2 items), avoidance (2 items), and sense of current threat (2 items). Second, Disturbances in Self-Organization Subscale, which consist of three clusters measuring affective dysregulation (2 items), negative self-concept (2 items), and disturbances in relationships (2 items). In addition to three items each for PTSD and DSO functional impairment. Respondents are categorized as having PTSD or CPTSD based on threshold criteria across these symptom clusters. Items are rated on a 5-point Likert scale (0 = not at all, 4 = extremely) referring to symptoms experienced in the past month. Scoring follows ICD-11 diagnostic algorithms, requiring scores ≥ 2 on at least one symptom from each cluster,

plus significant functional impairment. The ITQ has demonstrated strong internal consistency (Cronbach's α values typically between 0.84 and 0.92) in samples of veterans, adults, refugees, and university students and good construct validity. Cross-cultural validation has shown adequate reliability and measurement invariance across gender, race, and education levels, with acceptable model fit across the six symptom dimensions in confirmatory factor analysis (CFA)[29–32].

General health questionnaire-12 (GHQ-12): The GHQ-12 [33] is a widely-used screening instrument for psychological distress and general mental health problems experienced over the past few weeks. 12 items are rated on a 4-point Likert scale using the Likert scoring method (0-1-2-3), yielding total scores ranging from 0 to 36, to assess the severity of distress. The cut-off score of ≥ 16 was used based on recent validation studies in similar populations[34]. The GHQ-12 exhibits robust internal consistency (e.g., Cronbach's α values typically in the 0.70–0.90 range) in samples of refugees, adolescents, adults, and university students and demonstrates solid construct validity, with exploratory and confirmatory factor analyses supporting both one-dimensional and multi-factor models depending on the population[35,36]. As a sensitivity analysis, the binary scoring method (0-0-1-1) with a standard cutoff of ≥ 4 was also applied to assess the robustness of prevalence estimates across different scoring approaches[26].

Stress-coping strategies scale: Adapted from Długosz (2023), this instrument assesses war-related coping mechanisms through 8 binary (yes/no) items categorized into three types: problem-focused coping (2 items), emotion-focused coping (4 items), and avoidant coping (2 items)[37].

Translation and cultural adaptation: All standardized instruments were translated from English to Arabic using forward-backward translation procedures by independent bilingual researchers. Content validity was established through review by three experts in psychology, psychiatry, and public health with experience in Palestinian contexts.

Pilot testing: A pilot study was conducted with 37 students from Al-Quds University to assess survey comprehensibility and completion time. Based on pilot feedback, minor wording adjustments were made to improve clarity. The pilot sample was excluded from the main analysis.

Internal consistency reliability

All measurement instruments demonstrated good to excellent internal consistency reliability. The General Health Questionnaire-12 (GHQ-12) exhibited excellent internal consistency (Cronbach's $\alpha = 0.90$). The PTSD ($\alpha = 0.86$) and DSO ($\alpha = 0.89$) subscales of the International Trauma Questionnaire, demonstrated good internal consistency. These reliability coefficients exceed the minimum acceptable threshold of 0.7 and support the psychometric adequacy of the Arabic translations used in this Palestinian student population.

Data management and statistical analysis

Data analysis was conducted using Jamovi version 2.3, with statistical significance set at $p < 0.05$. Prior to analysis, data normality was assessed using visual inspection of distributions and confirmed by the Shapiro-Wilk test. Non-parametric statistical methods were employed given the non-normal distribution of data, with descriptive statistics presented as medians and interquartile ranges for continuous variables and frequencies with percentages for categorical variables. Mental health outcomes were analyzed through descriptive statistics, prevalence rates of mental health conditions, PTSD, and DSO symptom cluster analysis, and complex PTSD diagnostic patterns. Demographic factors and group differences were examined using Mann-Whitney U tests for gender comparisons and Kruskal-Wallis tests for checkpoint exposure effects on mental health outcomes. Age-related associations were assessed using Spearman's rank correlation coefficients. Furthermore, to identify independent predictors of diagnostic status, multinomial logistic regression was conducted with diagnostic category (no PTSD diagnosis [reference], PTSD-only, or CPTSD) as the dependent variable. Predictor variables included gender, age, number of checkpoint crossings, economic impact of the conflict, prior mental health diagnosis, and chronic physical conditions. Adjusted odds ratios (AOR) with 95% confidence intervals were calculated, and overall model fit was assessed using the likelihood ratio chi-square test and McFadden's pseudo-R^2.

Ethics approval and consent to participate

This study adhered to established ethical standards for research involving human participants and received ethical approval from the Research Ethics Committee of Al-Quds University (364/REC/2024) and official permissions from the participating universities prior to data collection. All methods were performed in accordance with the relevant guidelines and regulations, including the ethical principles outlined in the Declaration of Helsinki. Participation was entirely voluntary, with implied written consent obtained after participants read a comprehensive information sheet detailing study objectives, potential risks and benefits, confidentiality measures, and their right to decline participation. All data were encrypted and securely stored on servers accessible only to the research team to maintain confidentiality and anonymity. The survey information sheet included contact information for counseling services available to participants experiencing distress.

Result

The final analytical sample consisted of 819 Palestinian university students after excluding incomplete responses and those not meeting the inclusion criteria. Participant characteristics are presented in Tables 1 and 2. The sample was predominantly female (75.1%, $n = 615$) with a median age of 20 years (IQR = 2), and an age range (17–26 years). Geographical representation was achieved across all target governorates, with the largest participation from Hebron (23.0%), followed by Jenin (16.1%), Jerusalem (15.3%), and Ramallah (15.3%). Academic enrollment was distributed between healthcare-related fields (45.5%) and other disciplines (54.5%).

The majority of participants (86.7%, $n = 710$) reported that the current conflict had negatively affected their family's economic situation. Regarding mobility restrictions, 43.7% ($n = 358$) reported crossing no checkpoints

Characteristic	*n* (%)
Gender	
Female	615 (75.1)
Male	204 (24.9)
Geographic distribution	
Hebron	188 (23.0)
Jenin	132 (16.1)
Jerusalem	125 (15.3)
Ramallah	125 (15.3)
Bethlehem	114 (13.9)
Other governorates^a^	135 (16.4)
University affiliation	
Arab American University	205 (25.0)
Bethlehem University	162 (19.8)
Al-Quds University	113 (13.8)
Palestine Polytechnic University	113 (13.8)
Birzeit University	101 (12.3)
An-Najah National University	50 (6.1)
Hebron University	55 (6.7)
Other universities^b^	20 (2.5)
Academic major	
Engineering	171 (20.9)
Nursing & Health Professions	161 (19.7)
Medicine	108 (13.2)
Business	77 (9.4)
Arts & Literature	74 (9.0)
Dentistry	58 (7.1)
Other majors^c^	170 (20.7)

Table 1. Demographic and academic characteristics of the sample ($N = 819$). ^a^ Includes Nablus, Tulkarm, the Green Line territories, Qalqilya, Jericho, Tubas, and Salfit. ^b^ Includes Al Quds Open University, Palestine Technical University - Kadoorie, and Alzaytoonah University. ^c^ Includes Pharmacy, Education, Sciences, Law, Media Studies, Nutrition & Public Health, and Islamic Studies.

regularly, while 56.3% crossed one or more checkpoints daily. Most participants reported no chronic physical illnesses (88.4%) or family history of mental health conditions (89.6%). Previous mental health diagnoses were reported by a subset of participants, with anxiety disorders being most common (13.9%), followed by depression (10.9%), PTSD (4.2%), and other conditions (2.5% combined). Notably, 97.4% had not received mental health support from specialists during the current conflict period.

Mental health outcomes: descriptive statistics

Normality testing revealed that all primary mental health outcomes violated assumptions of normal distribution, necessitating non-parametric statistical approaches. Table 3 presents descriptive statistics for the main study variables.

Prevalence rates of mental health conditions

A large proportion of participants screened positive for psychological distress symptoms, with 87.2% of participants reporting psychological distress symptoms when the Likert scoring method was applied. Sensitivity analysis using the binary GHQ-12 scoring method with a cutoff of ≥ 4 yielded a psychological distress prevalence of 93%.

Over half of the sample (51.9%) met ICD-11 criteria for PTSD, with 25.5% meeting criteria for PTSD only and 26.4% meeting criteria for Complex PTSD. Additionally, 38.6% met ICD-11 criteria for clinically significant disturbances in self-organization. Table 4 displays prevalence rates for clinically significant mental health conditions based on established cut-off scores and diagnostic criteria.

PTSD and DSO symptom cluster analysis

The most prevalent PTSD symptom cluster was a sense of current threat (78.4%), followed by re-experiencing (73.6%) and avoidance (67%). Functional impairment related to PTSD symptoms was reported by 90.4% of participants. Among DSO clusters, affective dysregulation was most common (82.8%), followed by relationship disturbances (72.8%) and negative self-concept (46.3%). Individual symptom cluster prevalence was examined according to ICD-11 criteria for PTSD and Complex PTSD diagnosis (Table 5).

Characteristic	*n* (%)
Economic impact on the family	
Negative impact	710 (86.7)
No impact	68 (8.3)
No information	41 (5.0)
Checkpoint crossings (regular)	
None	358 (43.7)
1 checkpoint	149 (18.2)
2 checkpoints	180 (22.0)
3 checkpoints	78 (9.5)
≥4 checkpoints	54 (6.6)
Health characteristics	
Chronic physical conditions	95 (11.6)
Family history of mental health conditions	85 (10.4)
Previous mental health diagnoses	
Anxiety disorders	114 (13.9)
Depression	89 (10.9)
PTSD	34 (4.2)
Other disorders^d^	21 (2.5)
Mental health support	
Received specialist support during the conflict	21 (2.6)

Table 2. Conflict-related exposures and health characteristics of the sample ($N = 819$). ^d^Includes bipolar disorder and schizophrenia.

Variable	*n*	Median	IQR	Range	Skewness
Psychological Distress (GHQ-12)	819	18	3	0–36	-0.003
PTSD Symptoms (ITQ-PTSD)	819	12	7	0–24	-0.41
DSO Symptoms (ITQ-DSO)	819	11	9	0–24	0.24

Table 3. Descriptive statistics for mental health outcomes ($N = 819$).

Condition	*n*	(%)	95% CI
Psychological Distress (GHQ-12 ≥ 16)	714	87.2	84.7–89.4
Psychological Distress (GHQ-12 ≥ 4)	762	93	91.1–94.6
PTSD Diagnoses (ICD-11 criteria)	425	51.9	48.4–55.4
PTSD Only (PTSD without DSO)	209	25.5	22.6–28.7
DSO Only	316	38.6	35.2–42.0
Complex PTSD (PTSD + DSO)	216	26.4	23.4–29.5

Table 4. Prevalence rates of mental health conditions ($N = 819$). 95% CI = 95% Wilson score confidence interval.

Demographic factors and group differences

Gender differences

Mann-Whitney U tests revealed significant gender differences across multiple mental health outcomes (Table 6). Female participants demonstrated significantly higher levels of PTSD symptoms (Median = 12, IQR = 7) compared to males (Median = 10, IQR = 8; U = 51926, $p < 0.001$). No significant gender differences were observed for DSO symptoms ($p = 0.614$) and psychological distress ($p = 0.094$). These findings suggest that female Palestinian university students may be experiencing greater trauma-related symptomatology during the ongoing conflict.

Checkpoint exposure

Kruskal-Wallis tests revealed significant relationships between checkpoint exposure and mental health outcomes (Table 7). Participants crossing more checkpoints demonstrated progressively higher levels of PTSD symptoms ($p < 0.001$) and DSO symptoms ($p < 0.001$). Psychological distress remained relatively stable across checkpoint groups, showing no significant variation ($p = 0.688$). These findings demonstrate an important pattern where increased exposure to mobility restrictions is associated with greater trauma-related symptomatology.

Symptom Cluster	*n*	(%)	95% CI
PTSD Clusters			
Re-experiencing (ITQ items 1–2)	603	73.6	70.5–76.6
Avoidance (ITQ items 3–4)	549	67	63.7–70.2
Sense of current threat (ITQ items 5–6)	642	78.4	75.4–81.2
PTSD functional impairment	740	90.4	88.1–92.3
DSO clusters			
Affective dysregulation (ITQ items 1–2)	678	82.8	80.0–85.3
Negative self-concept (ITQ items 3–4)	379	46.3	42.8–49.8
Disturbances in relationships (ITQ items 5–6)	596	72.8	69.6–75.8
DSO functional impairment	671	81.9	79.1–84.5

Table 5. PTSD and DSO symptom cluster prevalence ($N = 819$). 95% CI = 95% Wilson score confidence interval.

Outcome	Female ($n = 615$)	Male ($n = 204$)	Mann-Whitney U	Effect Size	*p*-value
PTSD Symptoms	12 (7)	10 (8)	51,926	0.17	**< 0.001**
DSO Symptoms	11 (8)	11 (9)	61,253	0.02	0.614
Psychological Distress	18 (2)	18 (3)	57,887	0.08	0.094

Table 6. Gender differences in mental health outcomes Among Palestinian University Students. Values presented as Median (IQR). Mann-Whitney U tests were used due to non-normal distributions. Effect size reported as rank-biserial correlation (r).

Checkpoint count	*n* (%)	PTSD symptoms	DSO symptoms	Psychological Distress
0 checkpoints	358 (43.7)	11 (8)	10 (9)	18 (3)
1 checkpoint	149 (18.2)	11 (7)	9 (9)	18 (4)
2 checkpoints	180 (22.0)	11 (7.25)	11 (8)	18 (2)
3 checkpoints	78 (9.5)	12 (7)	11.5 (8.75)	18 (3)
≥ 4 checkpoints	54 (6.6)	14 (6)	14 (6)	18 (2)
Kruskal-Wallis p-value		< 0.001	< 0.001	0.688
Effect size (ε^2)		0.03	0.026	0.002

Table 7. Mental health outcomes by checkpoint exposure Among Palestinian University Students. Values presented as Median (IQR). Kruskal-Wallis tests were used due to non-normal distributions. Effect size reported as epsilon-squared (ε^2).

Age effects

Spearman's correlation analyses revealed minimal age-related associations with mental health outcomes in this sample of Palestinian university students. Age demonstrated a weak but significant negative correlation with psychological distress (r = -0.078, $p = 0.026$), suggesting that older students reported marginally lower levels of psychological distress. However, age showed no significant associations with PTSD symptoms (r = -0.016, $p = 0.655$), DSO symptoms (r = -0.016, $p = 0.638$). The limited age variability in our sample (range 17–26) likely contributed to the absence of meaningful age-related patterns.

Stress-coping mechanisms

Analysis of the 8-item coping strategies scale revealed distinct patterns of adaptive and maladaptive coping (Table 8).

As demonstrated in the table, religious coping was the most commonly used strategy (90.4%), followed by distraction (75.0%) and active coping (67.6%). Most participants relied on emotion-focused approaches, including thinking that things could be worse (57.6%). Problem-focused strategies were less common, with only 36.4% seeking advice from others. Avoidant coping was also present, with 32.4% reporting they give up or don't know what to do, 13.1% using substances, and 11.0% taking sedatives. These findings reflect the predominance of religious and emotion-focused coping among Palestinian students, alongside concerning rates of avoidant strategies.

Coping strategy	*n* (%)	Coping type
Get mobilized/actively cope	554 (67.6)	Problem-focused
Focus on other things (distraction)	614 (75)	Emotion-focused
Think things could be worse	472 (57.6)	Emotion-focused
Pray to God for help	740 (90.4)	Emotion-focused
Seek advice from others	298 (36.4)	Problem-focused
Take sedatives	90 (11)	Avoidant
Give up/don't know what to do	265 (32.4)	Avoidant
Use alcohol/tobacco/stimulants	107 (13.1)	Avoidant

Table 8. Frequency of stress-coping strategies ($N = 819$).

Variable	PTSD-only vs. No diagnosis			CPTSD vs. No diagnosis		
	AOR	95% CI	*p*-value	AOR	95% CI	*p*-value
Gender (ref: Male)						
Female	1.69	1.11–2.55	0.013	1.40	0.94–2.09	0.100
Age (continuous)	0.98	0.91–1.05	0.549	1.00	0.93–1.07	0.947
Checkpoints (ref: None)						
1 checkpoint	1.28	0.81–2.03	0.289	0.75	0.45–1.24	0.266
2 checkpoints	1.12	0.71–1.77	0.633	1.14	0.73–1.78	0.558
3 checkpoints	1.30	0.70–2.41	0.411	1.34	0.74–2.42	0.340
≥4 checkpoints	3.66	1.66–8.05	0.001	3.42	1.59–7.36	0.002
Economic impact (ref: No impact)						
Negative impact	2.71	1.54–4.76	< 0.001	2.78	1.57–4.92	< 0.001
Prior mental health diagnosis (ref: No)						
Yes	1.04	0.64–1.68	0.878	2.07	1.34–3.20	< 0.001
Chronic physical condition (ref: No)						
Yes	1.74	1.01–2.99	0.045	1.38	0.80–2.39	0.246

Table 9. Multinomial logistic regression: predictors of PTSD-only and CPTSD Diagnoses Among Palestinian University Students ($N = 819$). AOR = Adjusted Odds Ratio; CI = Confidence Interval; CPTSD = Complex Post-Traumatic Stress Disorder. Reference category for the dependent variable is no PTSD diagnosis ($n = 394$). PTSD-only group: $n = 209$; CPTSD group: $n = 216$. The model was statistically significant: $\chi^2(18) = 69.9$, $p < 0.001$, McFadden $R^2 = 0.041$. Bold p-values indicate statistical significance ($p < 0.05$).

Multinomial logistic regression analysis

To identify independent predictors of diagnostic status, multinomial logistic regression was conducted with the three-level diagnostic category (no PTSD diagnosis [reference], PTSD-only, or CPTSD) as the dependent variable. The overall model was statistically significant ($\chi^2(18) = 69.9$, $p < 0.001$, McFadden $R^2 = 0.041$). Results are presented in Table 9.

Regarding predictors of PTSD-only (compared to no diagnosis), three variables emerged as significant independent predictors. Female gender was associated with 69% higher odds of meeting PTSD-only criteria compared to males (AOR = 1.69, 95% CI: 1.11–2.55, $p = 0.013$). Negative economic impact of the conflict was associated with nearly three-fold higher odds of PTSD-only diagnosis (AOR = 2.71, 95% CI: 1.54–4.76, $p < 0.001$). Most notably, crossing four or more checkpoints regularly was associated with over three-and-a-half-fold higher odds of PTSD-only diagnosis compared to crossing no checkpoints (AOR = 3.66, 95% CI: 1.66–8.05, $p = 0.001$), while lower checkpoint frequencies did not reach statistical significance. Additionally, having a chronic physical condition was associated with 74% higher odds of PTSD-only diagnosis (AOR = 1.74, 95% CI: 1.01–2.99, $p = 0.045$). Age and prior mental health diagnoses were not significantly associated with PTSD-only status.

For CPTSD (compared to no diagnosis), a partially overlapping but distinct pattern of predictors was observed. Negative economic impact remained a strong predictor, with nearly three-fold higher odds of CPTSD (AOR = 2.78, 95% CI: 1.57–4.92, $p < 0.001$). Crossing four or more checkpoints was similarly associated with over three-fold higher odds of CPTSD (AOR = 3.42, 95% CI: 1.59–7.36, $p = 0.002$). Notably, having a prior mental health diagnosis was significantly associated with CPTSD (AOR = 2.07, 95% CI: 1.34–3.20, $p < 0.001$) but not with PTSD-only. In contrast to PTSD-only findings, female gender did not reach statistical significance for CPTSD (AOR = 1.40, 95% CI: 0.94–2.09, $p = 0.100$), and chronic physical conditions were not significantly associated with CPTSD. Age was not a significant predictor for either diagnostic category.

Discussion

This study provides important insights into the psychological impact of the 2023–2024 Gaza conflict on Palestinian university students in the West Bank. Our findings revealed an alarming prevalence of mental health problems, with 87.2% experiencing psychological distress and 25.5% meeting ICD-11 criteria for PTSD and 26.4% with Complex PTSD. 97.4% had not received professional mental health support, which points to a critical public health crisis requiring immediate intervention. What also surprised us was the high rates of affective dysregulation (82.8%) and relationship disturbances (72.8%) among DSO symptoms, suggesting that the conflict's impact may be associated with difficulties extending beyond traditional PTSD symptoms to fundamental aspects of students' emotional and interpersonal functioning.

To fully grasp the severity of our findings, it is essential to situate them within the broader landscape of Palestinian mental health research and the unique circumstances of the current conflict. The exceptionally high prevalence of psychological distress (87.2%) observed in our study likely reflects the acute and ongoing nature of the conflict, combined with the cumulative impact of decades of prolonged exposure to political violence and instability[38–40]. Our findings also align with previous research documenting elevated rates of psychological distress among Palestinian populations during conflicts[41–44].

From a comparative standpoint, the PTSD prevalence of 25.5% in our study falls within the range of previously reported rates for Palestinian populations, which have varied considerably, depending on measurement approaches and conflict timing[38,45,46]. Our use of ICD-11 criteria and specific assessment of Complex PTSD represents a methodological advancement that may account for higher detection rates compared to studies using older diagnostic frameworks.

The high prevalence of Complex PTSD (26.4%) is particularly significant, and the timing of our data collection, which was during ongoing rather than post-conflict conditions, reflects the unique nature of protracted conflict exposure, where trauma is continuous rather than discrete. Thus, the cumulative nature of trauma exposure among Palestinians, involving both historical and contemporary stressors, creates conditions that may be conducive to severe psychological disturbance.

Several methodological factors should be considered when interpreting the high prevalence rates observed in this study. First, data were collected during the acute phase of the conflict (4 to 6 months after onset), when traumatic stress reactions may not yet have resolved into stable clinical presentations, potentially inflating prevalence relative to post-conflict assessments. Second, self-report instruments, while standard in large-scale conflict research, may overestimate clinical caseness compared to structured clinical interviews. Third, the online convenience sampling strategy may have introduced selection bias, as students experiencing greater distress may have been more motivated to participate, while severely affected students who had disengaged from university or lost internet access would be underrepresented. Fourth, potential symptom overlap between the GHQ-12 and the ITQ's DSO subscale, particularly items assessing emotional functioning, could partially account for the co-occurrence of elevated scores on both measures. Notwithstanding these considerations, the sensitivity analysis using binary GHQ-12 scoring yielded an even higher distress prevalence (93%), and our PTSD rates are consistent with other acute-phase conflict studies in the region, supporting the overall robustness of our findings[47–49].

The strong association observed between checkpoint exposure and mental health outcomes provides empirical evidence for the psychological effects of mobility restrictions in the Palestinian context. Each checkpoint encounter represents not only a physical barrier but also a psychological assault involving humiliation, unpredictability, and power dynamics that compound over time. The cumulative effect of these daily experiences, described by Palestinian students as creating constant uncertainty and a 'pervasive sense of insecurity', demonstrates how structural restrictions on movement translate into measurable psychological harm[50].

Examining demographic patterns within our findings gave important insights into how conflict impacts different subgroups within the Palestinian student population. The gender differences observed in our study, with females showing higher PTSD symptoms, are consistent with the broader literature on gender differences in trauma response[51–54]. What renders these patterns particularly significant in the Palestinian context is their potential reflection of cultural and contextual factors unique to Palestinian society, encompassing differential exposure to conflict-related stressors and diverse cultural expectations concerning emotional expression and help-seeking behaviors. On the other hand, age exhibited a negligible impact on mental health outcomes in our sample, with a slight negative relationship identified between age and psychological distress, indicating that the intensity of the conflict impacts students similarly across various age groups. This finding suggests that the acute nature of the conflict may have created universal vulnerability across age groups within the student population.

The multinomial logistic regression analysis revealed important differential predictors of PTSD-only versus CPTSD, extending beyond the bivariate findings. While economic hardship and high checkpoint exposure (≥ 4 checkpoints) consistently predicted both conditions, key differences emerged. Female gender significantly predicted PTSD-only but not CPTSD, suggesting that the gender effect on trauma response may be more nuanced than previously assumed in this population. Conversely, prior mental health diagnoses specifically predicted CPTSD but not PTSD-only (AOR = 2.07, 95% CI: 1.34–3.20), indicating that pre-existing psychological vulnerability may be associated with the more severe complex trauma presentation characterized by disturbances in self-organization. The strong and consistent association between crossing four or more military checkpoints and both PTSD (AOR = 3.66) and CPTSD (AOR = 3.42) provides compelling evidence that high-frequency exposure to mobility restrictions represents a potent risk factor for trauma-related psychopathology, supporting the conceptualization of checkpoint encounters as repeated micro-traumas that compound over time.

Despite the concerning mental health outcomes documented in our study, Palestinian students demonstrate remarkable cultural resilience through their reliance on established coping mechanisms deeply rooted in their cultural and religious traditions. Our findings regarding coping strategies showed the predominance of religious coping (90.4%) among Palestinian university students, which is in line with previous research highlighting

the central role of religious faith in Palestinian coping mechanisms[55–57]. This finding, thus, underscores the importance of incorporating cultural and religious considerations into mental health interventions for this population.

The findings of our study have multiple implications for mental health policy and practice in Palestine. The alarmingly high prevalence of psychological distress and PTSD symptoms indicates an urgent need for comprehensive mental health support systems within our Palestinian universities. Considering that 97.4% of participants had not received specialist mental health support during the conflict, there is a critical gap between need and service provision that must be addressed. The predominance of religious coping strategies suggests that culturally appropriate interventions incorporating Islamic and Christian spiritual elements may be particularly effective for Palestinian students. In addition, the significant gender differences observed in our analysis indicate the need for gender-sensitive mental health interventions. Programs must target the distinct vulnerabilities of female students while acknowledging that male students may encounter obstacles to requesting assistance due to societal standards related to masculinity and emotional expression. Furthermore, the strong association between checkpoint exposure and mental health outcomes highlights the importance of addressing structural factors that contribute to psychological distress.

The near-equal prevalence of PTSD (25.5%) and CPTSD (26.4%) in our sample has direct implications for university-based mental health services. Standard trauma-focused cognitive behavioral therapy (TF-CBT), while effective for PTSD, may be insufficient for students meeting CPTSD criteria, who additionally require interventions targeting affective dysregulation, negative self-concept, and interpersonal difficulties. The high prevalence of DSO symptoms, particularly affective dysregulation (82.8%) and relationship disturbances (72.8%), suggests that university counseling centers should incorporate emotion regulation training (e.g., Skills Training in Affective and Interpersonal Regulation; STAIR) and group-based interpersonal interventions alongside traditional trauma processing. Furthermore, the low rate of mental health service utilization (2.6%) underscores the need for proactive, campus-embedded, and destigmatized mental health screening and referral pathways.

Our study has several notable strengths. Most importantly, it provides much-needed data on mental health outcomes during an ongoing conflict, filling a significant gap in the literature. The large sample size ($N = 819$) and broad geographical representation across the West Bank enhance the generalizability of our findings to Palestinian university students. The use of validated, culturally adapted instruments and rigorous translation procedures strengthens the reliability of our findings. Additionally, the examination of complex PTSD alongside traditional PTSD provides a more comprehensive understanding of trauma's impact on this particular population.

However, a number of limitations must be acknowledged. First, the cross-sectional design precludes causal inferences regarding the relationships between conflict exposure and mental health outcomes assessed in this study. Second, the use of convenience sampling, while necessary given the contextual constraints, may introduce selection bias. Third, the use of online surveys, while necessary for safety and accessibility during the conflict, may have excluded students without internet access, potentially underrepresenting certain socioeconomic groups. Beyond these methodological considerations, the self-report nature of all instruments may introduce potential bias, including social desirability bias and recall bias. Moreover, the lack of pre-conflict baseline data limits our ability to definitively attribute observed mental health problems to the current conflict versus pre-existing conditions or cumulative trauma exposure. Furthermore, the study's focus on university students may not capture the experiences of other vulnerable youth populations, such as those unable to access higher education due to economic or social constraints. Finally, the sample was 75.1% female, which, although broadly consistent with Palestinian university enrollment patterns, likely reflects differential response rates common in online survey research. This sex imbalance may affect the generalizability of gender-stratified findings.

Future research should prioritize three key areas to advance understanding and intervention development. First, longitudinal studies are essential to track how mental health symptoms evolve over time, especially in conflict settings, identifying which students recover naturally and which factors predict chronic versus episodic patterns. Second, research testing culturally adapted treatments specifically for Palestinian students represents an urgent priority, particularly approaches that incorporate religious coping strategies and address the unique stressors of the conflict exposure. Third, research examining broader impacts beyond mental health symptoms, including effects on academic performance, career development, and long-term life outcomes, would provide valuable insights for educational policy and support system development in Palestine. Finally, additional comparative research could examine mental health patterns across different Palestinian populations (Gaza, West Bank, and diaspora) to understand how varying conflict exposures and social contexts influence psychological outcomes.

In conclusion, this study highlights the considerable psychological impact of the 2023–2025 Gaza conflict on Palestinian university students in the West Bank, with high rates of psychological distress (87.2%), PTSD (25.5%), and complex PTSD (26.4%), and limited access to mental health support. These findings indicate a substantial mental health burden and point to the need for culturally sensitive and gender-responsive interventions within universities. Future longitudinal research is recommended to track changes in students' mental health over time and to better inform sustainable intervention strategies.

Data availability

Data are available from the corresponding author on reasonable request.

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Author contributions
IB: Conceptualization, Methodology, Data curation, Validation, Visualization, Formal analysis, Writing – original draft, Writing - Review & Editing, Project administration. AZ: Methodology, Formal analysis, Visualization, Writing – original draft, Writing - Review & Editing. MAQ: Data curation, Formal analysis, Writing - Review & Editing. MR: Data curation, Writing—original draft. HAS: Data curation, Writing—original draft. SK: Methodology, Writing - Review & Editing, Supervision. EK: Methodology, Writing - Review & Editing, Supervision.

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Declarations

Competing interests
The authors declare no competing interests.

Ethics approval and consent to participate
This study adhered to established ethical standards for research involving human participants and received ethical approval from the Research Ethics Committee of Al-Quds University (364/REC/2024) and official permissions from the participating universities prior to data collection. Participation was entirely voluntary, with implied written consent obtained after participants read a comprehensive information sheet detailing study objectives, potential risks and benefits, confidentiality measures, and their right to decline participation. All data were encrypted and securely stored on servers accessible only to the research team to maintain confidentiality and anonymity.

Consent for publication
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Additional information

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