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Prevalence and correlates of anxiety, depression, and symptoms of trauma among Palestinian adults in Gaza after a year of war: a cross-sectional study

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Abstract

Armed conflicts have a devastating effect on the civilian population, not only by direct violence but also by causing long-lasting psychiatric conditions, such as post-traumatic stress disorder (PTSD), depression, and anxiety, as a result of exposure to traumatic events such as displacement, loss of loved ones, and destruction of homes. The military attack on Gaza, which has been ongoing since October 7, 2023, compounds an environment of continuing fear, uncertainty, and loss, which markedly increases the prevalence of mental health disorders. This study aims to assess the prevalence of anxiety, probable PTSD, and depression in the population of Gaza after one year of continuous war. This study aims to offer a comprehensive perspective on the mental health challenges experienced by the people of Gaza. Data collection was carried out between November 10, 2024, and January 10, 2025. Four hundred five participants completed an online self-reported questionnaire, distributed via emails, social media platforms, and community networks. The survey screened for symptoms of PTSD (PCL-5), anxiety (GAD-7), and depression (PHQ-9), and included items assessing exposure to war-related experiences. The findings indicated alarmingly high rates of mental health symptoms, with 72.7% of participants reporting moderate to severe depression (PHQ-9 ≥ 10), 65% reporting moderate to severe anxiety (GAD-7 ≥ 10), and 83.5% meeting the threshold for probable PTSD (PCL-5 ≥ 33). The mean scores indicated moderate to severe symptom levels for anxiety and depression, with GAD-7 at 13.16 and PHQ-9 at 14.32. The mean PCL-5 score was 48.16, reflecting a substantial burden of PTSD symptoms among participants. A substantial proportion had lost a family member (45.7%), experienced a military siege (82.5%), witnessed someone being killed or injured (80.5%), and reported losing their work due to the conflict (42.7%). Binary logistic regression analysis revealed that losing a family member was significantly associated with moderate or higher levels of depression (OR = 2.395, $p = 0.010$) and anxiety (OR = 1.929, $p = 0.027$). Similarly, living in the northern part of the Gaza Strip was significantly associated with moderate or higher levels of depression (OR = 1.755, $p = 0.039$) and anxiety (OR = 2.395, $p = 0.010$). The simultaneous presence of any two of the three mental health conditions was statistically significant, with p values for each pairwise

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association being less than 0.05. The study revealed that the population of Gaza had an extremely high prevalence of diagnosable mental disorders, as determined through validated screening tools for anxiety, depression, and PTSD. These findings have far-reaching implications, emphasizing the urgent need not only for medical and psychosocial support, but more critically, for an end to the ongoing violence that continues to devastate lives and communities.

Keywords Mental health, Anxiety, Depression, War trauma, Psychometric assessment, Gaza, Conflict-affected populations

Background

Armed conflicts have a devastating effect on the civilian population, causing both direct physical harm through violence and lasting mental health effects, including deep and permanent psychiatric burdens. On October 7, a violent attack by Hamas resulted in the killing of Israeli civilians, marking a tragic escalation in the ongoing conflict. The hostilities resulted in significant civilian casualties and the widespread destruction of essential infrastructure within the Gaza Strip. According to a study by The Lancet, nearly 64,260 people died from traumatic injuries in Gaza between October 2023 and June 2024, a 40% increase in the official death toll of 37,877. Women, children and the elderly account for 59.1% of all casualties [1]. The destruction of infrastructure was devastating, with the housing sector suffering $13.3 billion in damage and total infrastructure losses nine times greater than those in the 2014 conflict. Health facilities have not been spared, with over 84% of medical complexes damaged by January 2025, further exacerbating the humanitarian crisis [2]. By December 2024, the United Nations (UN) reported that 22 out of 38 hospitals in Gaza were inoperable due to conflict-related damage [3]. These attacks have severely undermined medical services and exacerbated the humanitarian crisis in the region. Understanding the mental health burden of Gaza's population one year after the war is crucial to informing urgent and long-term mental health interventions.

Before the onset of the war on October 07, 2023, the people of Gaza were already suffering high levels of psychological distress as a result of decades of military escalation, blockade, economic hardship, and political instability [4, 5]. Studies predating this conflict revealed that nearly 70% of Gazans suffer from depression, and post-traumatic stress disorder (PTSD), is also widely reported among children and adults [6, 7]. Repeated cycles of violence and limited access to mental health services leave the population particularly vulnerable to mental health disorders. Between 7 October 2023 and 22 April 2025, at least 51,266 Palestinians have reportedly been killed in Gaza and 116,991 have been injured [8]. Around 1.9 million people (90% of the population) have been displaced [8]. The health system has collapsed, and over 700,000 people suffer from infectious diseases due to overcrowding and poor sanitation [9]. Arrests and disappearances of civilians, including doctors and aid workers, have deepened the crisis [10]. The UN Special Committee has expressed concern regarding Israel's military operations, noting that the destruction of critical infrastructure such as water, sanitation, and food systems has contributed to a severe humanitarian crisis for the civilian population [11]. Amnesty International has stated that Israel's actions in Gaza amount to genocide, citing extensive violations over nine months [12]. The psychological toll of displacement, loss, and daily trauma has created a widespread mental health crisis, demanding urgent and sustained international support. Reports from humanitarian organisations and mental health professionals have indicated a sharp increase in symptoms of anxiety, PTSD, and depression among children, women, and displaced individuals in Gaza [13]. However, comprehensive and systematic studies quantifying the prevalence of these disorders in the context of ongoing trauma remain limited.

Anxiety disorders, especially generalised anxiety disorder (GAD), are the most prevalent mental health disorders in conflict-affected populations [14]. GAD is described as having constant and uncontrollable worry, being restless, being unable to focus, being irritable, and sleeping poorly [15]. A persistent sensation of anxiety caused by persistent uncertainty about one's safety, food security, and the welfare of loved ones can negatively affect daily functioning and mental health in general [16].

The development of PTSD is another significant psychological outcome of prolonged exposure to armed conflict and violence [17, 18]. PTSD is a mental health condition that can develop following exposure to traumatic events, such as war, displacement, or personal loss. It is characterized by intrusive memories or flashbacks, emotional numbness, hyperarousal (e.g., heightened startle response, difficulty sleeping), and avoidance behaviours related to reminders of the trauma [18]. PTSD can severely impair daily functioning, relationships, and overall quality of life, often leading to long-term psychological and physical health issues if left unaddressed. Given the scale of traumatic experiences faced by Gazans, it is critical to assess the prevalence and severity of PTSD symptoms in the population. Previous studies have shown that the incidence of PTSD remains high even years after the cessation of hostilities, underscoring the need for early

identification and intervention to prevent chronic mental health complications [19, 20].

Depression is also prevalent in regions that have been affected by war to a high degree. Prolonged sadness, lack of hope, lack of interest in usual daily activities, fatigue, and thoughts of suicide are the main symptoms of depression. In some cases, fear and anxiety can lead to overemotional stimulation [21].

Research has consistently demonstrated the severe mental health impact of prolonged conflict and war-related trauma. Studies conducted in conflict zones suggest a significantly elevated prevalence of anxiety, depression, and PTSD among affected populations. A meta-analysis found that the aggregate prevalence of depression, anxiety, and PTSD in war-affected regions was 28.9%, 30.7%, and 23.5%, respectively [22]. Another systematic review estimated that 23.7% of civilians in conflict zones experience PTSD symptoms, while 25.6% suffer from depressive symptoms [23]. Such findings emphasize the psychological toll of war-related trauma and the long-lasting burden of unresolved stressors. Age-related differences in mental health outcomes have also been observed. Some studies indicate that older individuals report higher levels of psychological distress, particularly in prolonged crisis situations, possibly due to accumulated stressors over time or reduced resilience in coping with ongoing adversity. Conversely, younger populations, while also affected, may experience different adaptive responses depending on access to social support and coping mechanisms. Furthermore, psychiatric comorbidities among conflict-affected populations are well documented. Research suggests that PTSD frequently coexists with anxiety and depression, with individuals experiencing one condition being at heightened risk of developing additional psychological disorders [24]. The overlap between these conditions highlights the complex interplay of trauma-related stress and emotional dysregulation, necessitating comprehensive mental health interventions to address multiple dimensions of psychological distress.

Understanding the prevalence of mental health disorders such as anxiety, depression, and PTSD among people in the Gaza Strip is critical for allocating mental health resources and tailoring appropriate interventions. Accurate data enables timely responses that can help prevent long-term mental and physical complications. Moreover, assessing mental health within the context of ongoing conflict offers valuable insight into the acute psychological impact of war-related trauma. This is particularly important, as much of the existing literature focuses on post-migration refugee populations, often overlooking the severe mental health consequences experienced by individuals who remain in active conflict zones.

Aims of the study

This study aims to systematically assess the prevalence and severity of anxiety, trauma-related symptoms, and depression among Palestinian adults in Gaza after one year of continuous armed conflict, while identifying key demographic and war-related factors associated with moderate-to-severe mental health symptoms to provide a comprehensive understanding of the psychological impact of prolonged war exposure.

Hypotheses tested via regression analysis

H1: Greater exposure to war-related traumatic events (i.e., bereavement, displacement, and witnessing severe violence) will be significantly associated with higher levels of psychological distress, including depression, anxiety, and trauma-related symptoms.

H2: Proposes that older individuals report higher levels of depression, anxiety, and trauma-related symptoms than younger individuals do. This is assessed by analysing the association between age and the likelihood of exhibiting moderate-to-severe depressive, anxiety or trauma-related symptoms.

H3: Explores the presence of significant comorbidities among trauma-related symptoms, anxiety, and depression. This suggests that individuals who experience one of these conditions are at heightened risk of developing the other two. The study evaluates this by examining the extent to which the presence of PTSD, depression, or anxiety predicts the co-occurrence of additional mental health conditions.

By employing regression analysis to evaluate these hypotheses, this study provides a comprehensive understanding of the mental health burden among Gaza's civilian population in the aftermath of the conflict.

Methodology

Study design and participants

This cross-sectional exploratory study examined the prevalence of anxiety, trauma-related symptoms, and depression among Palestinians residing in Gaza one year into an ongoing armed conflict. Despite the significant logistical challenges inherent in the wartime context, we collected a sufficient number of responses to statistically represent the target population through an online self-report questionnaire. The study targeted adult Palestinians (aged 18 years and above) who were living in Gaza at the time of data collection. The inclusion criteria required that participants be Palestinian residents of Gaza during the study period, capable of providing informed consent, and able to complete the questionnaire in Arabic. Individuals who did not meet the criteria were excluded from the study.

Data collection

An online questionnaire was used to screen for symptoms of anxiety, trauma, and depression. The survey was spread through social media (e.g., WhatsApp, Facebook, and Telegram) and community networks to access a broad population segment. Owing to persistent humanitarian catastrophe and limited mobility in Gaza, an online survey was the most practical tool for reaching participants safely. Data collection was conducted during the period from November 10, 2024, to January 10, 2025. We calculated the required sample size via Cochran's formula on the basis of an estimated prevalence of 30% from a recent systematic review [25, 26]. With a 95% confidence level and a 5% margin of error, the minimum required sample size was 323. Our study included 405 responses, ensuring adequate statistical power and representativeness.

Study questionnaire

The questionnaire was systematically designed to collect comprehensive data that were aligned with the study objectives and structured into five distinct sections. The demographic information section provides details on the participants' age, sex, marital status, residential area, geographic location, and educational attainment. Exposure to war-related events was assessed by examining experiences such as the loss of family members, displacement, injury, and property damage (see Table 1). The mental health assessment utilised validated psychometric instruments to measure the prevalence and severity of anxiety, trauma-related symptoms, and depression.

Table 1 Study sample characteristics

Variable	Category	*n* (%)
Age	Mean (SD)	46.59(11.93)
Gender	Male	247 (61)
	Female	158 (39)
Geographical Location	Southern Gaza Strip	210 (51.9)
	Northern Gaza Strip	195 (48.1)
Experiencing a Military Siege	Yes	334 (82.5)
	No	71 (17.5)
Experiencing Displacement	Yes	343 (84.7)
	No	62 (15.3)
Losing a 1st degree Family Member	Yes	185 (45.7)
	No	220 (54.3)
Witnessing Someone Being **Killed** or Injured	Yes	326 (80.5)
	No	79 (19.5)
Being Arrested	Yes	23 (5.7)
	No	382 (94.3)
Losing Work Due to The War	Yes	173 (42.7)
	No	191 (47.2)
	Previously Unemployed	41 (10.1)

Note. SD = Standard Deviation; n = number of participants; % = percentage of total participants

Instruments

Generalized Anxiety Disorder-7 (GAD-7): The GAD-7 is a 7-item self-report questionnaire used to measure the severity of generalized anxiety disorder symptoms. Each item is rated on a 4-point Likert scale ranging from 0 (not at all) to 3 (nearly every day) based on symptom frequency over the past two weeks [27]. The total score ranges from 0 to 21, with commonly accepted cut-offs for anxiety severity as follows: 0–4 (minimal anxiety), 5–9 (mild anxiety), 10–14 (moderate anxiety), and 15–21 (severe anxiety) [28]. A cut-off score of 10 or above is typically used to indicate probable generalized anxiety disorder (GAD) [27]. The GAD-7 assesses symptoms such as "Feeling nervous, anxious, or on edge" and "Being so restless that it is hard to sit still". The scale has demonstrated high internal consistency, with a Cronbach's alpha of 0.88, indicating good reliability [27].

PTSD Checklist for DSM-5 (PCL-5): The PCL-5 is a 20-item self-report scale assessing symptoms of posttraumatic stress disorder (PTSD) based on DSM-5 criteria. Each item is rated on a 5-point Likert scale from 0 (not at all) to 4 (extremely), resulting in a total score ranging from 0 to 80 [29]. The PCL-5 evaluates symptoms such as "Repeated, disturbing, and unwanted memories of the stressful experience", "Suddenly feeling or acting as if the stressful experience were happening again" and "Having difficulty concentrating". A total score of 33 or higher indicates probable PTSD, not just trauma symptoms [30]. The scale has demonstrated excellent internal consistency, with a Cronbach's alpha of 0.95, indicating strong reliability [29].

Patient Health Questionnaire-9 (PHQ-9): The PHQ-9 is a 9-item self-report questionnaire used to assess the severity of depressive symptoms over the past two weeks. Each item is rated on a 4-point Likert scale ranging from 0 (not at all) to 3 (nearly every day), producing a total score between 0 and 27 [31]. Scores are categorized as follows: 1–4 (minimal depression), 5–9 (mild depression), 10–14 (moderate depression), 15–19 (moderately severe depression), and 20–27 (severe depression) [31]. The PHQ-9 includes items such as "Thoughts that you would be better off dead", "Thoughts of hurting yourself in some way" and "Little interest or pleasure in doing things". The scale has demonstrated high internal consistency, with a Cronbach's alpha of 0.90, indicating strong reliability [31].

All scales used in the study have been validated in Arabic and have demonstrated strong reliability and validity in previous studies conducted in conflict-affected populations [32–34].

Ethical considerations

The Research Ethics Committee of Al-Azhar University granted the study's ethical approval, ensuring compliance

with ethical guidelines and standards for research involving human participants. Informed consent was obtained from all individuals prior to their voluntary completion of the questionnaire, and strict measures were taken to guarantee the confidentiality of all responses.

Data analysis

IBM SPSS Statistics (version 23) was utilised for data cleaning, coding, and analysis. To maintain data integrity, duplicate and incomplete entries were excluded. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were used to summarise demographic characteristics and mental health outcomes. Prevalence rates for anxiety, depression, and trauma-related symptoms were determined on the basis of the previously mentioned cut-off scores. We used the Mahalanobis distance (MD) to detect multivariate outliers in anxiety (GAD-7), depression (PHQ-9), and PTSD (PCL-5) scores.

Descriptive statistics, including the mean and standard deviation, were calculated for each scale and subscale. Binary logistic regression analysis was used to examine the associations between mental health conditions and potential risk factors. The independent variables included age, gender, geographical location and exposure to war-related adversity. The dependent variables were the presence of moderate to severe anxiety, moderate to severe depression, and probable symptoms of trauma. s.

Results

Sample characteristics

Four hundred and five individuals participated in the study. The mean age of the participants was 46.59 years (SD = 11.93). Most participants were male (61%). The questionnaire included items assessing exposure to specific war-related experiences. The mean age of the participants was 46.59 years (SD = 11.93). Most participants were male (61%). Participants were relatively well-educated, with the vast majority (92.1%) holding a bachelor's degree or higher. Regarding living conditions, nearly two-thirds (63%) lived in apartments, while others resided in tents or shelters. Geographically, the sample was almost evenly split between the southern and northern parts of the Gaza Strip. The exposure of participants to war-related adversities was substantial. A majority (82.5%) reported experiencing a military operational siege and isolation of their neighbourhood, facing severe shortages and restricted access to essentials. In comparison, 84.7% were displaced, 45.7% had lost a family member, 80.5% witnessed someone being killed or injured, and 42.7% reported losing their job due to the war (Table 1).

Table 2 The prevalence of depression, anxiety, and probable PTSD

Outcome Variable	Category	*n* (%)
Depression Assessment (PHQ-9)	None	32 (8)
	Mild Depression	78 (19.3)
	Moderate Depression	102 (25.2)
	Moderately Severe Depression	91 (22.5)
	Severe Depression	101 (25)
Anxiety Assessment (GAD-7)	No Anxiety	43 (10.6)
	Mild Anxiety	99 (24.4)
	Moderate Anxiety	109 (26.9)
	Severe Anxiety	154 (38.1)
Posttraumatic Stress Disorder (PTSD) Assessment (PCL-5)	Not Probable PTSD	67 (16.5)
	Probable PTSD	338 (83.5)

Note. PHQ-9 = Patient Health Questionnaire-9; GAD-7 = Generalised Anxiety Disorder-7; PCL-5 = PTSD Checklist for DSM-5

Prevalence of depression, anxiety, and symptoms of trauma

The findings indicated alarmingly high rates of mental health symptoms, with 72.7% of participants reporting moderate to severe depression, 65% reporting moderate to severe anxiety, and an exceptionally high proportion of participants (83.5%) met criteria for probable PTSD. The mean total scores further reflect the severity of symptoms in this population: GAD-7 averaged 13.16, indicating moderate to severe anxiety; PCL-5 averaged 48.16, well above the cut-off, suggesting a high burden of PTSD symptoms; and PHQ-9 averaged 14.32, consistent with moderate to severe depressive symptoms. Additionally, 219 participants (54%) developed severe depression and anxiety simultaneously with probable PTSD (Table 2).

Correlates of depression, anxiety, and PTSD

Logistic regression models were applied to examine the associations between developing PTSD and moderate levels of anxiety and depression or higher with different covariates. The analysis revealed that losing a family member ($p = 0.037$, OR 1.90) and living in the northern part of the Gaza Strip ($p = 0.01$, OR 2.39) were significantly associated with a moderate level of depression or higher. The model demonstrated a good fit, with a p value < 0.001, Nagelkerke $R^2 = 0.49$, and a nonsignificant Hosmer–Lemeshow test result ($p = 0.65$), indicating adequate model calibration. Additionally, the percentage accuracy in classification (PAC) was 83.7%.

Individuals who had witnessed someone being **killed** or injured were significantly more likely to report moderate or severe levels of anxiety compared to those who had not, with an odds ratio (OR) of 3.03 and a p-value of 0.001. This indicates that exposure to such traumatic events increased the likelihood of anxiety symptoms by more than three times, and the association was statistically significant. Similarly, participants who had lost a family member had higher odds of experiencing anxiety (OR = 1.75, $p = 0.03$), meaning they were 75% more likely

to report moderate or severe anxiety. In addition, living in the northern part of the Gaza Strip was associated with increased anxiety symptoms (OR = 1.92, $p = 0.02$), reflecting a 92% increase in the odds of anxiety compared to those living in other areas. The logistic regression model overall was statistically significant ($p < 0.001$), suggesting that the combination of predictors reliably explained the likelihood of experiencing moderate to severe anxiety. The model showed good explanatory power, with a Nagelkerke R^2 of 0.43, indicating that 43% of the variance in anxiety levels was accounted for. Furthermore, the Hosmer–Lemeshow test was nonsignificant ($p = 0.11$), confirming an adequate model fit. The model correctly classified 79.5% of the cases, demonstrating good predictive accuracy.

Moreover, age was significantly associated with both depression and experiencing PTSD symptoms. As age increased, the likelihood of experiencing moderate to severe depression (OR = 0.959, 4.1% decrease per year) and experiencing probable PTSD (OR = 0.94, 6% decrease per year) decreased, whereas the likelihood of moderate to severe anxiety increased (OR = 1.04, 4% increase per year), with all associations being statistically significant ($p < 0.05$ for all). The co-occurrence of any two of the three mental health conditions—probable PTSD, moderate or higher levels of depression, and moderate or higher levels of anxiety—was found to be statistically significant. Specifically, each pairwise association among these conditions showed a p-value less than 0.05 (Table 3), providing strong evidence that the presence of one condition is significantly associated with the presence of another. These findings suggest that symptoms of PTSD, depression, and anxiety tend to cluster together rather than occur in isolation, reinforcing the need for comprehensive mental health assessments in this population.

Discussion

This study aimed to determine the prevalence and risk factors for anxiety, PTSD, and depression among Palestinian adults in Gaza after one year of ongoing war. Given the extreme circumstances of the ongoing conflict, this study sought to identify key demographic and war-related factors associated with moderate to severe mental health symptoms. In addition, this study aimed to examine the interaction between anxiety, PTSD, and depression and to highlight the comorbidity of these conditions in conflict-affected populations. Understanding these patterns is critical for developing mental health interventions, public health policies, and humanitarian responses tailored to the unique challenges facing the people of Gaza. The findings of this study underscore the severe psychological impact of the current war on Palestinian adults in Gaza, who reported high levels of PTSD, anxiety, and depression one year after the aggression. The majority of participants experienced moderate to severe anxiety (65%) or depression (72.7%), and approximately 83.5% met the criteria for probable PTSD. Since 1948, Palestinians have experienced mass displacement and intergenerational trauma, reflecting their high level of psychological vulnerability [25]. Research conducted in conflict-affected regions such as Syria, Afghanistan, and other war zones has similarly documented elevated prevalence rates of depression, anxiety, and posttraumatic stress disorder, often exceeding 30–50% [1]. These findings underscore the widespread psychological burden experienced in war-affected populations and highlight the cumulative impact of prolonged trauma and socioeconomic instability resulting from armed conflict [26, 27]. Although gender is often considered a relevant factor in psychological outcomes, our results did not show statistically significant differences between male and female participants [28–30]. Given the exploratory aims of the study and the lack of a priori theoretical justification for gender-specific hypotheses in this context, we did not include gender as a focal variable in our analyses. Future studies with larger and more diverse samples could examine gender-related patterns in greater depth.

In our sample, mental health problems were significantly correlated with several important characteristics. The loss of a family member was found to be a significant correlate of higher levels of depression and anxiety, which is consistent with previous studies that have shown that bereavement during war is a critical risk factor for mental disorders. In addition, moderate or high levels of anxiety were significantly associated with encountering a person **killed** or injured, explaining the psychological impact of proximity to violent events. Studies of conflict-affected populations have revealed that individuals exposed to violence are 50% more likely to develop moderate to severe anxiety symptoms, reinforcing the link between experiencing violence and higher rates of depression [31, 32].

Previous literature suggests that older adults are generally less vulnerable to depression, anxiety, and trauma-related symptoms due to enhanced emotional regulation and adaptive coping mechanisms [33–35]. Our findings partially support this, as increasing age was associated with lower levels of depression and trauma symptoms. However, anxiety symptoms showed a positive association with age, indicating that older individuals in our sample reported higher levels of anxiety. This divergence highlights that while older individuals may be more resilient to certain psychological burdens such as depression and trauma, they may still face growing anxiety—potentially due to chronic stressors, health concerns, or socioeconomic instability that accumulate with age, particularly in the context of prolonged conflict.

Table 3 Binary logistic regression analysis for the three outcome variables

Independent Variables	Moderate to Severe Depression				Moderate to Severe Anxiety				Probability of PTSD			
	P value	OR	95% C.I.		*P* value	OR	95% C.I.		*P* value	OR	95% C.I.	
			Lower	Upper			Lower	Upper			Lower	Upper
Age	0.006	0.951	0.918	0.986	0.018	1.04	1.007	1.075	0.002	0.943	0.907	0.979
Gender (ref Female)	0.722	1.13	0.576	2.216	0.831	0.938	0.52	1.692	0.307	0.682	0.327	1.422
Educational Level (ref Secondary School)	0.813				0.238				0.243			
Bachelor's Degree	0.275	0.424	0.091	1.976	0.385	0.597	0.186	1.912	0.061	3.437	0.943	12.526
Master's Degree	0.166	0.326	0.067	1.59	0.859	0.892	0.254	3.134	0.019	5.259	1.318	20.985
Doctorate Degree	0.383	0.478	0.091	2.512	0.093	0.32	0.085	1.21	0.034	4.893	1.125	21.278
Experiencing a Military Siege	0.731	0.876	0.41	1.868	0.563	1.223	0.619	2.418	0.85	1.088	0.456	2.592
Losing a Family Member	0.037	1.903	1.039	3.486	0.039	1.755	1.028	2.997	0.599	0.84	0.439	1.608
Displacement	0.91	0.954	0.421	2.161	0.797	1.097	0.542	2.219	0.293	0.607	0.239	1.541
Witnessing Someone Being Killed or Injured	0.581	0.815	0.394	1.684	0.001	3.038	1.593	5.795	0.708	0.86	0.39	1.894
Losing Work Due to The War (ref Previously Unemployed)	0.428				0.075				0.232			
Yes	0.238	0.506	0.163	1.57	0.285	1.659	0.656	4.195	0.103	2.445	0.834	7.165
No	0.492	0.676	0.221	2.066	0.738	0.852	0.334	2.175	0.11	2.323	0.827	6.526
Geographical Location (ref Southern Part of Gaza)	0.01	2.395	1.228	4.669	0.027	1.929	1.078	3.451	0.836	1.079	0.524	2.221
Arrested	0.496	1.482	0.477	4.602	0.756	0.836	0.27	2.59	0.098	0.372	0.115	1.202
Severe Depression	—	—	—	—	0.006	0.354	0.17	0.737	< 0.001	4.45	2.111	9.377
Severe Anxiety	< 0.001	0.086	0.046	0.161					0.006	0.356	0.171	0.741
Probable PTSD	< 0.001	0.213	0.101	0.451	< 0.001	11.75	6.285	21.989	—	—	—	—

Note. OR = odds ratio; CI = confidence interval; PTSD = posttraumatic stress disorder

This correlation may reflect specific contextual stressors faced by older adults in Gaza, such as declining health, disrupted access to medical care, and concern for family members amid ongoing violence. One possible explanation for older adults' adaptability to depression and PTSD may be the unique contextual factors influencing the study population. In contrast to the population in general, older adults in Gaza may have developed resilience due to prolonged exposure to adversity, including recurrent conflict, displacement, and economic hardship. Furthermore, the cultural context within the Gazan community, which includes a more significant social or family support system, may help reduce the long-term effects of chronic stress and depression. Nonetheless, older participants' elevated anxiety levels can also be a reflection of their growing concern about their susceptibility to crises. Frequent daily challenges during conflict, including age-related health problems, limited health care services, and uncertainty about the future, can contribute to feelings of helplessness and fear, which can exacerbate anxiety. According to a neuroscience study, long-term stress exposure can also cause anatomical alterations in the brain that increase susceptibility to anxiety disorders [36].

In this regard, Ressler et al. (2024) found that among elderly Ukrainians residing in previously occupied frontline areas, PTSD prevalence exceeded 50%, and loneliness was strongly associated with increased PTSD symptom severity across re-experiencing, avoidance, and hypervigilance domains [37]. These findings reinforce the critical role of social isolation and loss in shaping trauma responses among older adults living in war zones. In line with their findings, our study also revealed that the loss of a family member—a proxy for both bereavement and potential loneliness—was significantly correlated with higher levels of depression and anxiety. This comparison highlights how shared mechanisms, such as prolonged exposure to violence and disrupted social bonds, may operate across different conflict-affected populations in older people.

The co-occurrence of any two mental health problems (PTSD, depression, or anxiety) was statistically significant, highlighting the interconnectedness of these conditions and the difficulties in treating comorbidities in conflict-affected communities [38]. Studies consistently show that trauma survivors typically experience a variety of overlapping mental health conditions rather than isolated disorders [39]. Multiple losses, whether to homes, communities, or loved ones, intensify trauma and can result in cooccurring mental health disorders. In contrast to isolated events, cumulative losses disrupt coping mechanisms and increase vulnerability to long-term distress. Research has shown that individuals who experience multiple deaths are 3.5 times more likely to develop chronic depression [1, 40]. Previous studies have indicated that those who witness war and violence are more prone to suffer from several mental health issues at the same time; up to 70% of PTSD sufferers also experience anxiety or depression [39]. Theoretically, chronic trauma can lead to structural and functional changes in key brain regions involved in the stress response, contributing to overlapping symptoms such as hyperarousal and emotional dysregulation [40, 41]. This comorbidity hinders the management process, highlighting the need for multifaceted mental healthcare interventions.

Although this study highlights the significant challenges facing mental health in Gaza, it has several limitations. Our sample was predominantly composed of highly educated individuals, with over 90% holding a bachelor's degree or higher and having internet access, representing a more resourceful subset of the population. Due to the use of an online self-report questionnaire, our sample may be biased toward individuals with higher education levels and access to digital devices, which limits the generalizability of the findings to the broader Gazan adult population. Additionally, online data collection may exclude vulnerable populations, such as elderly individuals and those living in extreme poverty, due to challenges such as infrastructure destruction and limited internet access, leading to selection bias. Given evidence from previous research indicating that lower socioeconomic status populations typically sustain a higher psychological impact in conflict settings, it is likely that the prevalence and severity of mental health problems in the broader Gazan population are even greater than our findings suggest [41]. Furthermore, the reliance on self-reported data raises concerns about recall and response bias, as stigma and distress may have influenced participants' responses.

The study relied on symptom-based diagnostic tools (PCL-5, GAD-7, and PHQ-9), which assess the severity of psychological symptoms rather than direct trauma exposure. However, these tools have been widely validated and used in diverse cultural and conflict-affected populations, including settings comparable to Gaza, consistently demonstrating strong reliability and validity. While some critiques suggest that traditional PTSD models conceptualize trauma as a singular past event, the PCL-5 has shown high sensitivity to ongoing trauma, as evidenced by its ability to detect extremely elevated rates of probable PTSD —even surpassing levels reported in other war-exposed refugee populations [42–44]. This supports the tool's effectiveness in capturing the psychological toll of chronic and cumulative trauma. Nevertheless, it remains important to acknowledge that symptom-based tools may not fully reflect the broader sociopolitical, intergenerational, and culturally nuanced dimensions of distress in protracted conflict settings like Gaza.

Importantly, this study does not capture the mental health status of children, who are particularly vulnerable to the psychological consequences of prolonged exposure to violence and displacement. Due to logistical constraints and ethical considerations, we were unable to include children in our sample. Future research should address this critical gap and emphasize the development of family-oriented and child-specific mental health interventions to mitigate the intergenerational effects of trauma. Additionally, future studies should incorporate context-sensitive, qualitative, and ethnographic methodologies to develop a more comprehensive understanding of mental health in protracted conflict settings. Despite these limitations, the findings underscore the urgent need for trauma-sensitive mental health interventions tailored to the unique sociocultural and geopolitical realities of Gaza.

Conclusion

This study sheds light on the severe and widespread psychological impact of the ongoing war on the Palestinian population in Gaza. The results revealed high rates of anxiety, depression, and posttraumatic disorder, with a focus on the deep mental health crisis that appeared in the wake of constant conflict, displacement, and loss. Key risk factors such as bereavement, direct exposure to violence, and geographic location were significantly associated with worse mental health outcomes. These results emphasise the urgent need for immediate and long-term mental health interventions, including accessible psychological support, community-led resilience programs, and enlightened care. Healthcare providers, humanitarian organisations, and policymakers must prioritise mental health services as integral to the humanitarian response.

Author contributions

M.Z.1, Y.H.2, M.H.5, and M.H.6: Conceptualisation and literature review. Y.H.2, M.H.5, and M.H.6: study design and tool development. M.Z.1 and O.A.6: Data collection. Y.H.2, G.V.3, and A.K.4: data analysis and interpretation. M.Z.1 and O.A.6: Data curation. Y.H.2 and S.S.7: Figure preparation. M.Z.1, Y.H.2, G.V.3, and A.K.4, and S.S.7 led the writing of the study manuscript and reviewing process. All authors contributed to the manuscript revision and have approved the final version. All authors have read and agreed to the published version of the manuscript.

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Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

Ethical approval for the study was granted by the Research Ethics Committee of Al-Azhar University. All methods were carried out in accordance with the ethical principles of the Declaration of Helsinki. Informed consent was obtained from the participants.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Clinical trial number

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