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# Post-traumatic stress, sense of coherence, and growth after the February earthquake: Evidence from teacher training institute students in Syria

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## ABSTRACT

The current study aims to determine the nature of the relationship between post-traumatic stress disorder, sense of coherence, and post-traumatic growth, as well as their prevalence levels, in light of the experience of students at the Teacher Training Institute, related to the February 6 earthquake. To achieve this, the study's criteria were applied to a sample of 175 students from the Teacher Training Institute, branches (Souran and Mare'), in northwestern Syria. The descriptive correlational approach was adopted. The results showed a high prevalence coefficient for the study variables. There were no gender differences in PTSD and sense of coherence, while females achieved more post-traumatic growth than males. There is also a high positive correlation between sense of coherence and post-traumatic growth in terms of the sub-components and the total score, except the spiritual change component. Furthermore, individuals suffering from PTSD have a low level of sense of coherence. Recommendations: The need to focus on developing guidance programs that stimulate a sense of psychological cohesion and post-traumatic growth to protect young people from psychological disorders.

## KEY WORDS:

institute students; February earthquake; Northwestern Syria; sense psychological coherence; PTSD; PTG

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## Introduction

The 7.8 magnitude earthquake of February 6, 2023, was a natural disaster with a massive, destructive impact that affected southern Turkey and northern Syria, along with the subsequent aftershocks. What are potential psychological protective factors (such as a sense of coherence and posttraumatic growth), and what about PTSD? This was in the absence of stable health support or effective local institutions in northwest Syria, in addition to the lack of political stability. The nature of the situation, coupled with the ongoing experience of war and internal displacement since 2011, could create an unstable psychological environment. This highlights the need to study the psychological aspects resulting from the magnitude of the natural disaster against a backdrop of successive traumatic events. in light of the scarcity of studies that focused on this aspect, especially in Syria. These events included loss, physical and psychological impacts, economic difficulties, loss of social support networks, and loss of shelter, all of which affected many groups. However, some positive psychological traits help individuals continue effectively, necessitating the study of psychological concepts related to such circumstances, such as a sense of psychological cohesion that paves the way for post-traumatic growth. What is the nature of the relationship between these variables under such circumstances? This could pave the way for measures that support the kind of psychological interventions that can bear fruit under such circumstances.

To further clarify the impact of the earthquake Caused the February earthquake massive destruction. The earthquake caused more than 7,259 deaths, more than 12,000 injuries, destroyed more than 5,000 homes, and damaged more than 20,000 others. The earthquake had significant political, economic, and social repercussions, including increased divisions among factions seeking political gain from the crisis, and a weakening of disaster mitigation measures. A large number of residents of Harem and Afrin (the two areas most affected by the earthquake) were displaced to already densely populated areas, living in tents. They are in need of shelter, and they are also facing problems at security checkpoints, particularly the continued shelling by the regime of these areas, which began after the first day of the earthquake. This has increased pressure on limited resources and disrupted the fragile health system, which has been

damaged, with 55 health centers either completely or partially destroyed. The only available route was to transfer cases to Turkey, as was previously the case, but the Turkish health system was affected and this route was closed. The delay in the entry of equipment and aid has contributed to increased mortality and morbidity rates, and even delayed the arrival of food supplies (Ekzayez, 2023, p. 2—6).

A study Cénat et al. (2020) indicated that the incidence of natural disasters has tripled since 1980. Based on their reference study, they explained that earthquakes have numerous and varied effects, including those related to mental health, particularly the prevalence of post-traumatic stress disorder (PTSD), depression, anxiety, and others. The prevalence of PTSD reached 9% as a result of the 2015 Nepal earthquake (Schwind et al., 2019). The prevalence of PTSD was 26.3% following the Wenchuan earthquake (Zhang et al., 2011). In contrast, based on the reference study by Ando et al. (2017), it was shown that the prevalence of PTSD was 10% following the earthquake in all studies reviewed. While some longitudinal studies observed an improvement in PTSD reactions over time, none reported a decrease in depression. A closer look at what Sundin and Horowitz (2002,2003) indicated of evidence of a gradual decline over time in both intrusion and avoidance symptoms among victims with a wide range of traumatic experiences. In contrast, Op den Velde et al. (1993) found that intrusive and avoidant behaviors can increasingly appear many years after the trauma (Veronese & Pepe, 2014, p. 597).

Considering the variables that have an impact on the outcomes of disasters, Çitak (2023, p. 117) demonstrated that there are differences among earthquake survivors, which may be due to demographic characteristics (Başoălu et al., 2014), Zhang et al. (2011) showed that females are more susceptible to PTSD, in addition to other studies (Baloğlu et al., 2005; Farooqui et al., 2017). Psychological mechanisms (such as "social support, resilience, attachment, and empathy") (Wang et al., 2020), as well as socioeconomic factors. Also, political structures in the earthquake zone (Gerstner et al., 2020) are important. Therefore, further studies on earthquakes, focusing on various cultural and psychological variables, are needed to provide disaster preparedness and effective social and psychological support after an earthquake.

Qualitative studies have identified several domains of PTG, including personal, interpersonal, and spiritual changes (Jung & Han, 2023). Studies on PTG in the context of earthquakes indicate the importance of cognitive appraisal and SOC in determining PTG (Najfi et al., 2020). They also highlight the

importance of practicing meditation and modifying core beliefs in promoting post-traumatic growth. This was the case following the April 2014 earthquake (Soto et al., 2016). Following the Chilean earthquake, religious education and social support contributed to promoting PTG (García et al., 2016). Following the 1999 Marmara earthquake, the ability to solve problems optimistically played a role in promoting PTG (Karanci & Acarturk, 2005). Based on a study (Turan Yılmaz, & Ertekin, 2022, p. 268) argue that there is a need for multidisciplinary research on PTG, which is known to be therapeutic in dealing with difficult life circumstances and reducing the risk of mental disorders due to various traumas.

Regarding studies that focus on the nature of the relationship between PTSD and PTG, some studies have shown that PTSD and PTG can coexist (Ragger et al., 2019). However, other studies have shown that there is no relationship between the two variables (Wang et al., 2020; Wu et al., 2015). In the context of earthquake experience, a study (Beaglehole et al., 2023) demonstrated a weak relationship between the two variables. Conversely, some studies have confirmed a relationship between them (Turan, et al, 2022; Şenyüz et al., 2021). Therefore, assessing PTSD and PTG is essential after natural disasters to determine their psychological effects (Beaglehole et al., 2023).

In another context, Tedeschi and Calhoun (2004) attempt to put PTG on a scientific basis, suggesting that a sense of psychological coherence (SOC) may be an indicator of PTG because it helps individuals understand and cope with circumstances and find meaning in life. They also hypothesize that both a sense of coherence and PTG represent personality traits that enable people to cope appropriately with stressful life events. In the same context, according to (Çam & DemiRkol, 2019, p. 175), the SOC that leads an individual to exist, take action, believe in themselves, and utilize resources may be a strong indicator of PTG that ensures staying strong despite a difficult event (Ekzayez, 2023; Bağ 2017; Eriksson 2016; Lindström & Eriksson 2006). While there are few studies examining the relationship between these two concepts SOC and PTG in the international literature (Ragger et al., 2019; Arya & Davidson 2015; Walsh 2011; Aguirre 2008), Çam & DemiRkol, (2019, p. 175) emphasize that a specific correlation between SOC and PTG cannot be determined at present, as sufficient research has not been conducted. Therefore, more data and accumulated information related to PTG and SOC are needed to obtain data. More accurate and valid (Walsh, 2011). Each factor that may help people overcome trauma, even as they grow, should be examined in detail as the number of people experiencing trauma increases (Özen, 2017).

Furthermore, no studies on the same topic have been found in the Arabic and local literature. It is worth noting that studies have shown that people with a high SOC have a protective factor against PTSD (Pham et al., 2010; Kaźmierczak et al., 2011; Behnke et al., 2019; Streb et al., 2014; Schäfer et al., 2019), but not in the context of natural disasters such as earthquakes.

Based on the prolonged exposure to trauma and instability in northwest Syria, particularly after the February 2023 earthquake, this study aims to investigate the prevalence and interrelationships among post-traumatic stress disorder (PTSD), sense of coherence (SOC), and post-traumatic growth (PTG) among teacher training institute students. The research further seeks to determine whether these psychological variables differ according to gender and to explore potential variations in SOC between students who suffer from PTSD and those who do not. By situating the investigation within a population that has experienced both war-related and disaster-induced adversity, the study endeavors to contribute to a deeper understanding of how individuals maintain psychological coherence and achieve growth amid compounded crises.

Accordingly, the present study hypothesizes that (1) the research variables differ by gender among institute students following the February earthquake, (2) sense of coherence varies between students who experience PTSD and those who do not, and (3) there is a significant positive correlation between sense of coherence and post-traumatic growth. The findings are expected to provide empirical insights into protective psychological mechanisms that foster resilience and positive adaptation in post-disaster and post-conflict contexts, thereby informing future psychosocial interventions and educational support programs for youth in fragile settings.

## Method

The research relies on a descriptive correlational approach, consistent with the nature of the research hypotheses, which seeks to describe and address the relationship between the studied variables within their cultural, geographical, and political frameworks.

### Sample

The number of students who wished to participate in the research was 175 students from the Teacher Training Institute (Mare' and Soran) from northwestern Syria, belonging to some disciplines. The sample was randomly drawn, with 47 males and 128 females. Their ages ranged between 18 and 46 years, with a mean age of 26.57 and a standard deviation of 6.108.

**Table 1**
*Sample Characteristics*

| | Specialization | | Number | Percentage |
|---|---|---|---|---|
| Mar'a Institute | Class teacher | First-Year | 34 | 19.4% |
| | | Second-Year | 48 | 27.4% |
| Souran Institute | Class teacher | First-Year | 30 | 17.1% |
| | Turkish Language | | | |
| | English Language | | | |
| | Mathematics | Second-Year | 53 | 30.2% |
| Gender | Male | | 47 | 26.9% |
| | Female | | 128 | 73.1% |
| Total | | 175 | | 100% |

## Instruments

The psychometric properties of the scales used to measure the research variables are presented in turn. The Psychological Coherence Sense Scale, prepared by Antonovsky (1987), the second abbreviated version, consists of 13 items divided into three sub-components: transparency or clarity (4 items), understandability (5 items), and feelings of meaning (4 items). The scale is answered using a seven-point Likert scale. Scores ranged from 13 to 91. The statements are generally positive. Translated into Arabic by Rawan Nasser Al-Din (2022), it was standardized on a Syrian sample of 100 Syrian women aged 25-55. The validity of the arbitrators was verified and their opinions were taken into account. Internal consistency between each statement and the component score to which it belongs was verified, ranging from 597.0 to 869.0. Cronbach's alpha reliability coefficient values ranged from 0.71 to 0.79. For the components, the total score was 0.81. The split-half scores ranged from 0.70 to 0.81. This was for the components, while the total score was 0.82 (Nasr al-Din, 2022, p. 110-112).

The Posttraumatic Growth Inventory (PTGI) Tedeschi and Calhoun (1996) translated by Khattab and Muhammad (2021,p. 367—372) consists of 21 statements divided into five components: (appreciation of life, relationships with others, personal strength, new opportunities, and spiritual change). The answers are based on a six-point Likert scale. All statements are positive. It was administered to a sample of 157 individuals from Syria, aged 17-69. Regarding the psychometric properties, the validity and reliability values were high and satisfactory, with internal consistency values between the dimensions and the

total score of the inventory ranging from 0.735 to 0.868. While the Cronbach's alpha reliability coefficient for this list as a whole was 0.908, the Cronbach's alpha reliability coefficients for its dimensions were: social relationships (0.790), new opportunities (0.756), personal strength (0.739), spiritual changes (0.738), and life appreciation (0.669).

The Davidson Post-Traumatic Stress Scale (PTSD) - translated by Thabet (2005) - consists of seventeen items, each with five responses, ranging from absolute denial to affirmation of the presence of these trauma-related feelings. Response options are (never, rarely, sometimes, often) = (0-4). Test scores range from zero to 68. It was standardized on a sample of 360 Palestinian students, with a split-half coefficient of 0.71 and a Cronbach's alpha of 0.82 (Behnke et al., 2019; Kaźmierczak et al., 2011; Pham et al., 2010; Schäfer, 2019; Streb et al., 2014) (Saydam and Thabet, 2007, p. 12).

## Implementation Procedures

After collecting theoretical frameworks and previous studies on the research variables, the research scales were determined and their suitability for the sample was confirmed. Approval was obtained from the institute directors, specifying the research objective, its conditions, and the sample to be applied, with a copy of the scales attached. A suitable date was then agreed upon for the administration to allow for the sample collection. Ethical aspects related to the conditions of application and sample collection were observed in a location familiar to the students within their classrooms. End of the second semester of the 2022-2023 academic year.

## Statistical Methods

Students' responses to the research scales were transcribed into SPSS after coding each questionnaire. Upon completion, the research hypotheses were addressed. Among the statistical methods used were Pearson's internal consistency coefficient to address the fourth hypothesis, exploratory factor analysis to address the first hypothesis, and independent samples t-tests to address the second and third hypotheses.

# Result

This section presents the statistical findings obtained to address the research questions and test the proposed hypotheses. Data collected from 175 students at the Teacher Training Institute in northwestern Syria were analyzed using the Statistical Package for the Social Sciences (SPSS). The analyses included

calculating prevalence coefficients, conducting independent samples t-tests to examine gender-based and PTSD-level differences, and computing Pearson's correlation coefficients to explore the relationships among the study variables. The descriptive and inferential results are displayed in the following tables, providing a clear overview of the prevalence levels, group differences, and inter-variable correlations identified in the study.

**Table 2**

*Prevalence Coefficient of the Research Variables and Subcomponents Associated with Each Variable Among the Research Sample*

| Variables | Sense of psychological coherence | | | | Post-traumatic stress disorder | | | | Post-traumatic growth | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Clarity and Transparency | Understandability | feelings of meaning | Overall Score | Recovering the traumatic experience | Avoiding the traumatic experience | Arousal | Overall Score | Appreciating Life | Relationships with Others | Personal Strength | New Opportunities | Spiritual change | Overall Score |
| Commonality coefficient | .719 | .991 | .491 | .997 | .582 | .653 | .680 | .999 | .464 | .632 | .646 | .529 | .385 | .982 |

The results of the statistical processing shown in the previous Table 2 show an increase in the prevalence coefficient of the research variables.

**Table 3**

*Independent Samples T-Test Regarding Gender Differences via Independent Samples T-Test*

| Statistical values for study variables | | Sample | Mean | Standard deviation | df | t-value | p-value |
|---|---|---|---|---|---|---|---|
| Sense of psychological coherence | Male | 47 | 48.34 | 8.257 | 173 | .763 | .447 |
| | female | 128 | 47.30 | 7.938 | | | |
| Post-traumatic stress disorder | Male | 47 | 33.09 | 10.671 | 173 | .110 | .912 |
| | Female | 128 | 33.28 | 10.338 | | | |
| Post-traumatic growth | Male | 47 | 57.23 | 13.686 | 173 | 2.570 | .012 |
| | Female | 128 | 63.35 | 14.665 | | | |

Statistical analysis table 3 reveals no gender-related differences in either SOC or (PTSD). The t-value for coherence was 0.763, which is not statistically significant. The t-value for PTSD was 1.10, which is not statistically significant.

In contrast, the t-value for post-traumatic growth was 2.570, which is significant at the 1.2% significance level, which is less than 5%. Considering that the mean for females = 63.35, which is greater than the mean for males, females achieved a higher level of post-traumatic growth than males.

**Table 4**

*Independent Samples T-Test Regarding the Difference in PTSD Level via Independent Samples T-Test*

| Statistical values for study variables | | Sample | Mean | Standard deviation | df | t-value | p-value |
|---|---|---|---|---|---|---|---|
| Clarity and Transparency | not suffer from PTSD | 100 | 16.61 | 5.091 | 173 | 4.824 | .000 |
| | not suffer from PTSD PTSD | 75 | 13.08 | 4.355 | | | |
| Understandability | not suffer from PTSD | 100 | 13.97 | 4.305 | `73 | 1.479 | .141 |
| | suffer from PTSD | 75 | 13.03 | 3.997 | | | |
| feelings of meaning | not suffer from PTSD | 100 | 19.34 | 3.605 | 173 | 1.764 | .080 |
| | suffer from PTSD | 75 | 18.35 | 3.794 | | | |
| Sense of psychological | not suffer from PTSD | 100 | 49.92 | 7.962 | 173 | 4.732 | .000 |
| | suffer from PTSD | 75 | 44.45 | 6.995 | | | |

The previous table 4 shows that the t-value reached 4.732, which is statistically significant, regarding the total degree of sense of coherence in the direction of those who do not suffer from PTSD, given that their arithmetic mean reached 49.92, which is greater than the mean of those who suffer from PTSD. Regarding the clarity component, the t-value reached 4.824, which is statistically significant, in the direction of those who do not suffer from PTSD, given that their mean was 16.61 higher than that of those who suffer from PTSD. As for both components (the ability to understand and the sense of meaning), it was shown that there were no differences between the two samples. The table 5 shows a correlation between sense of coherence and post-traumatic growth for the total score and all sub-components except spiritual change.

**Table 5**

*Correlation Coefficient Between the Sense of Psychological Coherence and Post-Traumatic Growth via Pearson's Correlation Coefficient*

| | Appreciating Life | Relationships with Others | Personal Strength | New Opportunities | Spiritual change | post-traumatic growth |
|---|---|---|---|---|---|---|
| Clarity and Transparency | .905** | .907** | .904** | .883** | .029 | .921** |
| Understanda-bility | .899** | .907** | .915** | .894** | .005 | .925** |
| feelings of meaning | .160* | .276** | .139 | .124 | .139 | .239** |
| Sense of psychological coherence | .939** | .948** | .947** | .930** | .049 | .962** |

## Discussion

The first question clarified the high level of prevalence of the research variables and their sub-components. The research results were consistent with the findings of Şenyüz et al. (2021) and Smith et al (2016) regarding PTSD and PTG. However, Çitak (2023) found that 46.8% of earthquake survivors have high level of PTSD. The high levels of these variables may be consistent with Veronese & Pepe (2014, p. 598) who demonstrated that avoidance symptoms may be more prevalent if an individual experiences anxiety sensitivity, which in turn leads to heightened fear after exposure to a stressful event (Elwood & Williams, 2009). Furthermore, Furthermore, high levels of emotional arousal due to the traumatic event contribute to escape or avoidance behaviors (Maack & Kim, 2012). However, although avoidance strategies may initially be successful in managing feelings of distress, their negative effects become apparent over time, given that continuing with such a strategy does not help regulate emotions (Hayes et al., 1996).

As Ragger et al. (2019, p. 2) explained, both Tedeschi and Calhoun (2004) view PTSD and SOC as independent systems that can coexist. After going through a painful experience, an individual may be able to make positive changes in their efforts to preserve their life. However, they also retain the pain associated with the memory of the event. They also emphasized that previous studies have shown that experiencing traumatic events, just as they lead to negative outcomes such as PTSD, can also lead to bring about influential psychological developments, including PTG. Therefore, Both PTG and SOC can be considered appropriate personality traits that help people deal with difficult life situations

more effectively. This is linked to supportive psychological activities within counseling programs (emotion regulation and management, reassessment of traumatic situations, relaxation exercises, etc.), which can be implemented, especially in war-related or disaster-related settings. This is based on the results of this research and other research, particularly in our Arab region.

Psychosocial factors such as resilience, marital status, and post-traumatic growth (PTG) indicate a complex interaction influenced by cultural and social contexts, as is the case in Syrian or Middle Eastern settings. The high levels of post-traumatic stress disorder (PTSD) among individuals may be attributed to the multiplicity and diversity of ongoing trauma resulting from armed conflict, displacement, and prolonged insecurity, along with the deterioration of overall services and uncertainty about the future—conditions particularly common in the Syrian context.

However, factors such as cohesive social support and religion play a relatively protective role. Religion, as part of the Arab cultural construct, promotes acceptance of trauma and reframing it within concepts such as patience and affliction, contributing to increased levels of post-traumatic growth. Strong social bonds, especially during difficult times, also raise perceived social status, which supports the process of psychological recovery.

The results of the first hypothesis indicate no gender-based differences in SOC and PTSD. However, females exhibit greater PTG than males. So, the research findings are somewhat consistent with those of (Smith et al, 2016), Males reported lower scores on PTG than females, particularly with respect to components of post-traumatic growth such as communication skills, life evaluation, and personal strength. However, females reported greater distress from the earthquake and an inability to cope with life's stresses than males.

Based on what (Çam & DemiRkol, 2019, p. 172) explained, Antonovsky explained that a SOC is formed during the first 30 years of life and can only be altered by major life events. However, there are those who claim that a SOC is dynamic throughout the lifespan. In addition, research by Bağ (2017) suggests that a SOC can be developed through psychotherapy. Antonovsky also indicated that women from low-income and working-class backgrounds are the most at-risk group for having a low SOC. However, in another study by Volanen'in (2011), men scored higher on a SOC. Women scored higher on a SOS in a study by Horiguchi et al. (2016). Therefore, it is believed that examining generalized resistance resources and a SOS in larger groups discussing gender roles within a cultural context could be beneficial.

The similarity of harsh conditions affecting both genders, and the changing nature of life and increasing responsibilities on both sides contributed to the lack of differences in (PTSD). The reality in Syria, with its diverse psychological, social, and awareness-raising services provided by numerous institutions and organizations, has contributed to raising the SOC among both genders, given that the services provided reach all members of society. However, the difficulty of providing opportunities and the increasing responsibilities on the shoulders of young people may contribute to the burdens that may hinder the development of PTSD, given that most job opportunities are available to a higher percentage of women in an environment that demands that men play a greater role in supporting the family and society.

In relation to the second hypothesis, it was found that individuals who do not suffer from PTSD have a good level of SOC (sense of meaning, clarity and transparency) but not the ability to understand. So, the results of this study are consistent with the findings of (Schäfer et al., 2019; Pham et al., 2010).

One of the most important factors that influences the feeling of coherence is how an individual interprets stressful external stimuli, whether by reducing their value or increasing the individual's control over his life, which in turn contributes to raising the feeling of SOC. According to Antonyovsky (1981), every success in facing difficult situations supports a SOC and increases an individual's resilience to future stressors (Suominen & Vahtera, 2010, p. 150).

Antonovsky's theory suggests that a SOC is a protective factor for an individual's physical and psychological health. Therefore, developing this component can help reduce physical and psychological disorders. This is achieved by strengthening the components of the SOC and studying the reactions of these individuals. Future studies should also investigate the impact of customs, traditions, and the nature of a community's culture on activating the SOC (Pham et al., 2010, pp. 319—320). This, in turn, has implications for how psychological services are provided in refugee camps and the role of supporting humanitarian organizations.

Regarding the absence of differences between the two groups (the ability to perceive and feel meaning), although people who suffer from PTSD suffer from a loss of passion for life and their mental mechanisms are affected by negative perception of the self and the environment, or the inability to solve problems and others (Chen, 2023, p. 2–3). However, we cannot ignore the multiplicity and diversity of traumatic experiences that the sample went through, whether related to the experience of war or continuous displacement and exposure to torture and

even exposure to natural disasters such as living in tents in difficult conditions or even the occurrence of earthquakes and the decline in the necessities of life and political instability, which may have affected the sample individuals.

In relation to the third hypothesis, there was a correlation between PTG and the SOC in relation to the total score and the sub-components, except spiritual change. So, the research results are consistent with what was confirmed by the study (Ragger et al., 2019; Streb et al., 2014). Antonovsky (1979, 1993) explained how health can be promoted despite challenging environmental conditions, based on his introduction of the concept of SOC and its subcomponents of "meaning, wholeness, and manageability." Following the experiences of survivors, Sagy and Antonovsky (1996) explained that the results of what they receive within a supportive and structured environment help individuals achieve balance despite heavy loads (burdens beyond their capacity), the ability to make sound decisions, and contribute to life while receiving recognition for their efforts (Veronese & Pepe, 2014, p. 598).

Considering that those who can find a deep sense of cohesion as a result of life experiences contribute to achieving an appropriate level of post-traumatic growth.

Henson et al. (2021, p. 21) indicated that what promotes positive emotional growth includes several points, including reflection, expressing emotions, coping skills, empathy, diversity of traumatic experiences, and positive responses. Some researchers have indicated that there are mediating variables that promote post-traumatic growth, such as receiving support, positivity, the level of faith, and belonging. All of these play an unnoticed role in providing or enhancing support, or in the quantity and quality of receiving social support.

Should be noted here that there are a fair number of quantitative studies that have addressed the research variables. Unfortunately, no work has been done to develop preventive or supportive programs for trauma based on this body of studies, which would have contributed to activating youth mental health, enhancing psychological well-being, and alleviating human suffering and the burden of psychotherapy.

The lack of a correlation with spiritual change may be due to the nature of the life difficulties experienced by the sample members, where there is a clear level of faith. However, the exacerbation of painful events and the absence of hope may be an obstacle to effective positive change in this context.

## Conclusion

The findings of this study provide empirical evidence on the interconnected roles of post-traumatic stress disorder (PTSD), sense of coherence (SOC), and post-traumatic growth (PTG) among students exposed to the February 2023 earthquake in northwestern Syria. Beyond confirming the associations among these variables, the study contributes theoretically by reinforcing and contextualizing Antonovsky's salutogenic model within a post-disaster setting characterized by chronic instability and cultural resilience. Specifically, the results suggest that SOC functions not only as a protective factor mitigating PTSD symptoms but also as a cognitive–motivational mechanism that facilitates PTG, thereby extending existing models of trauma adaptation to populations affected by compounded crises such as war and natural disaster.

This theoretical contribution lies in demonstrating that coherence-oriented coping can coexist with post-traumatic distress, supporting the dual-pathway model of trauma outcomes. Moreover, by situating these dynamics within a socio-political and cultural context marked by prolonged adversity, the study offers a context-sensitive extension of existing theories of psychological adjustment and growth.

However, several limitations should be noted. First, the study sample was restricted to two teacher training institutes and included only students who voluntarily participated, which may limit generalizability. Future studies should involve larger and more diverse populations across multiple regions. Second, the use of self-reported measures may introduce bias; therefore, subsequent research could combine quantitative and qualitative approaches or longitudinal designs to strengthen causal inferences.

Practically, the study provides a foundation for designing preventive and therapeutic interventions that integrate meaning-making and coherence enhancement into trauma recovery programs. Future research should test this extended framework across broader populations and over time to examine causal pathways and the stability of these relationships.

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