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Evaluating Cognitive Resilience in PTSD-Affected Individuals

تقييم المرونة الذهنية عند المصاب باضطراب ما بعد الصدمة

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الملخص:

تهدف هذه الدراسة إلى تقييم المرونة الذهنية لدى المصابين باضطراب ما بعد الصدمة، من خلال تسليط الضوء على عينة من الفلسطينيين المقيمين في الجزائر الذين تعرضوا لحوادث صدمية، والمتمثلة في استشهاد أقاربهم في فلسطين. تم اعتماد المنهج الوصفي، حيث شملت العينة أربعة مشاركين خضعوا لاختبار الضغط ما بعد الصدمة واختبار المرونة الذهنية، بالإضافة إلى مقابلات عيادية شبه مهيكلة.

أظهرت النتائج أن حالتين من العينة تعانيان من اضطراب ما بعد الصدمة، في حين لم تظهر الحالتان الأخريان أي أعراض للاضطراب، بل تميزتا بمرونة ذهنية عالية، وفقًا لاختبار المرونة الذهنية. كما كشفت نتائج التحليل أن المرونة الذهنية تلعب دورًا أساسيًا في الحماية من الصدمات النفسية وتقليل احتمالية الإصابة باضطراب ما بعد الصدمة، مما يؤكد وجود علاقة إيجابية بين المرونة الذهنية والقدرة على التصدي للصدمات النفسية في حدود العينة المدروسة.

الكلمات المفتاحيّة:

تقييم، المرونة الذهنية، اضطراب ما بعد الصدمة، الصدمة النفسية، الفلسطينيون في الجزائر.

Abstract:

This study aims to evaluate mental flexibility in individuals with post-traumatic stress disorder (PTSD) by examining a sample of Palestinians residing in Algeria who have experienced traumatic events, specifically the loss of relatives in Palestine. A descriptive research method was employed, and the sample consisted of four participants who underwent a PTSD assessment, a mental flexibility test, and semi-structured clinical interviews.

The results revealed that two participants were diagnosed with PTSD, while the other two did not exhibit PTSD symptoms and demonstrated high mental flexibility according to the flexibility test. Further analysis indicated that mental flexibility plays a crucial role in resilience against psychological trauma and reduces the likelihood of developing PTSD. These findings suggest a strong correlation between mental flexibility and the ability to cope with traumatic experiences within the studied sample.

Keywords:

Assessment, mental flexibility, post-traumatic stress disorder (PTSD), psychological trauma, Palestinians in Algeria.

1. INTRODUCTION

Post-Traumatic Stress Disorder (PTSD) is a severe psychological condition that affects individuals who have experienced traumatic events, such as wars, natural disasters, or major accidents. This disorder significantly impacts individuals' mental, cognitive, and physiological functioning, often leading to long-term impairments. One of the most crucial factors influencing the development and severity of PTSD is mental resilience, which refers to an individual's ability to adapt to unexpected stressors and recover from psychological distress. Mental resilience is not only about coping with crises but also maintaining functional and social performance after traumatic experiences.

While there is considerable research on PTSD and its effects, the relationship between mental resilience and executive functions, particularly in populations exposed to war-related trauma, remains underexplored. Understanding this relationship is essential to identifying how mental resilience might help mitigate PTSD symptoms and contribute to recovery after trauma.

This research addresses this gap by examining the role of mental resilience in mitigating PTSD symptoms among individuals who have endured war-related trauma in Palestine. Specifically, it seeks to determine whether individuals diagnosed with PTSD exhibit deficits in mental resilience and how these deficits correlate with impairments in executive functions. These executive functions include cognitive abilities such as reasoning, problem-solving, self-regulation, and social interactions, which are critical for adapting to and overcoming traumatic experiences.

The gap in existing literature lies in the lack of studies that link mental resilience with PTSD, especially in populations affected by ongoing conflicts, such as the Palestinian community. This research aims to contribute to understanding how mental resilience acts as a protective factor against PTSD and its symptoms, by examining a sample of four participants exposed to the traumatic experiences of the Palestinian war. It also seeks to explore the role of executive functions in how these individuals cope with trauma, with the hope of providing insights into how mental resilience influences PTSD recovery.

By addressing this gap, this study will deepen our understanding of the psychological mechanisms involved in trauma recovery and resilience. The findings will have practical implications for therapeutic interventions targeting mental resilience to reduce PTSD symptoms in trauma-exposed populations.

Restatement of the Research Problem:

This study seeks to explore the relationship between mental resilience and the development of Post-Traumatic Stress Disorder (PTSD) in individuals exposed to traumatic events, particularly within the context of the ongoing conflict in Palestine. Through focusing on Palestinians residing in Algeria who have experienced trauma due to the war in Palestine, this research aims to evaluate the role of mental resilience in reducing PTSD symptoms and its relationship with executive functions in these individuals. The study will assess whether mental resilience can help prevent or reduce PTSD symptoms in individuals exposed to prolonged trauma.

The research gap lies in the lack of studies linking mental resilience to PTSD symptoms in communities affected by continuous trauma, such as Palestinian communities. This study aims to evaluate whether individuals with high mental resilience are less likely to develop PTSD, and how their executive functions contribute to their coping abilities

Do individuals with PTSD experience a dysfunction in mental resilience?

General Hypothesis:

Individuals with PTSD experience a dysfunction in mental resilience.

Definitions:

- **Post-Traumatic Stress Disorder**:

Terminologically: Exposure to a traumatic event leading to symptoms such as inhibition, self-withdrawal, isolation, and loss of interest (Pierre, 1994, p. 42).
Operationally: The score obtained on the PTSD stress test.

- **Mental Resilience**:

Terminologically: The capacity to shift between different responses, adapt to mistakes, develop new strategies, allocate attention effectively, and manage multiple streams of information simultaneously(Hassanein, 2021, p. 230).

Study Objectives:

1. Examine the relationship between executive functions and PTSD.
2. Explore the impact of PTSD on mental resilience.
3. Highlight the importance of psychological well-being for maintaining effective executive functions.

Study Significance:

This study is crucial given the pressing and severe consequences of the ongoing aggression against Palestinians. It emphasizes the impact of psychological stress and disorders on executive functions, which disrupt behaviors, social interactions, and cognitive responses, highlighting the profound psychological toll of sustained conflict.

1. Theoretical Framework :

2.1. Post-Traumatic Stress Disorder (PTSD)

- **Psychological Stress**: Refers to our negative perceptions of events as threats or dangers to our lives, combined with inadequate or inappropriate responses. Stress can be categorized into various types, such as physiological, psychological, and social.
- **PTSD**: A psychological condition resulting from exposure to a profoundly distressing event that exceeds ordinary human experiences.

2.2. Symptoms of PTSD:

Primary Symptoms:

- **Re-experiencing the trauma**: The spontaneous reliving of traumatic experiences, often in the form of vivid images or painful emotions that are difficult to control.
- **Avoidance Behavior**: Patients actively avoid thoughts, images, and objects associated with the traumatic event. In children, this avoidance may manifest as reenacting the trauma through play or interaction with others.
- **Physiological Responses**: These include muscle spasms, high blood pressure, increased heart rate, insomnia, and difficulty concentrating.
- **Flashback Phenomenon**: A temporary yet intense episode in which the individual struggles to differentiate between reality and past trauma.
- **Emotional Numbness and Withdrawal**: A reduction in engagement with the external world and diminished interest in significant activities, often as a coping mechanism.
- **Feelings of Guilt**: Persistent self-blame becomes pathological, though sharing responsibility with others may alleviate this burden.

Secondary Symptoms:

- Depression
- Anxiety
- Psychosomatic Disorders
- Death Anxiety
- Substance Abuse (alcohol or drugs)(Yaacoub, 1999, p. 43)

2.3. Mental Resilience:

- **Definition**:

Mental resilience is the ability to transfer knowledge, behavioral responses, or perspectives as a means of adapting to the demands of various situations an individual may face. This executive function is fundamental for organizing thought processes and issuing appropriate cognitive and behavioral responses. It is particularly crucial for individuals with psychological disorders, enabling them to manage life challenges effectively, correct errors, and adopt better approaches.

- **Development of Cognitive Flexibility**:

Cognitive flexibility skills begin to emerge in early childhood, with a sharp increase in capabilities between the ages of 7 and 9 years. By the age of 10, cognitive flexibility becomes largely developed, though it continues to improve throughout adolescence and into adulthood, peaking between the ages of 21 and 30 years. (Djani et al., 2015, p. 6)

2. Practical Framework :

Following the theoretical framework, the practical section outlines the methodological steps undertaken to achieve the study's results:

Spatial and Temporal Scope:

- The study was conducted in Algiers, Algeria, between February and November 2024.

Methodology Used:

- The **descriptive method** was adopted as it is the most suitable approach for evaluating mental resilience in Palestinians diagnosed with Post-Traumatic Stress Disorder (PTSD).

Sample:

- The study sample comprised **four Palestinians residing in Algeria**, all of whom experienced traumatic events caused by terrorist assaults on Gaza.

Study Tools:

- **Semi-structured Clinical Interview:**

A semi-structured clinical interview was used to collect comprehensive information regarding the participants' psychological, relational, and health statuses. The interview guide was designed to cover the following four dimensions:

- ✓ **Personal data**
- ✓ **Health condition**
- ✓ **Psychological state**
- ✓ **Future aspirations**

- **PTSD Scale (IES-R):**

- The **Impact of Event Scale-Revised (IES-R)**, developed by Weiss and Marmar, was used to measure PTSD symptoms associated with various traumatic events such as illnesses, sexual assault, and natural disasters.

- It evaluates three major symptoms:

- ✓ **Intrusive symptoms**
- ✓ **Avoidance behaviors**
- ✓ **Hyperarousal and autonomic nervous system reactions**

- The scale consists of **22 items**.
- **Dimensions of the Scale:**

- ✓ **Intrusive Symptoms:** Items 1, 2, 3, 6, 9, 14, 16, 20
- ✓ **Avoidance Behaviors:** Items 5, 7, 8, 11, 12, 13, 17, 22
- ✓ **Hyperarousal Symptoms:** Items 4, 10, 15, 18, 19, 21

The scoring is done according to a graduated scale from 0 to 4. A score is given for each item based on the respondent's choice: if they select "Never," they receive a 0; if they select "Rarely," they receive a 1; if they select "Moderate," they receive a 2; if they select "Above Average," they receive a 3; and if they select "Frequently," they receive a 4.

PTSD Diagnosis:

The total score on scale determines the severity of PTSD:

- 44+ points: The participant is diagnosed with PTSD.
- Below 44 points: The participant is not diagnosed with PTSD.

Score Range	Severity of PTSD
0–8	No stress
9–25	Mild stress
26–43	Moderate stress
44+	Severe stress

To identify the most prevalent symptom, the scores for each symptom (intrusive, avoidance, hyperarousal) are summed. The results are then converted into percentages using the formula:

Percentage= Points per Symptom*100/total points

Mental Resilience Test:

The Verbal Fluency Test was employed to assess mental flexibility:

- The participant is asked to list as many names (starting with a given letter) as possible within one minute.

Scoring Criteria:

Number of Words	Points
10 or more	3
6–9	2
3–5	1
0–2	0

3. Case Descriptions :

Case 1: (M-A)

- 27-year-old Palestinian male, university student, multilingual (speaks 5 languages)/Lost 14 family members in the terrorist attack on Gaza. /No psychological or physical disorders, does not use sedatives or inhibitors.

Case 2: (S-F)

- 59-year-old Palestinian male, teacher, has a family and owns a house./Lost some family members in Palestine./Suffers from sleep deprivation and anxiety.

Case 3: (J-M)

- 58-year-old Palestinian male, resident in Algeria since the age of 10, has a family and owns a house. / Lost his entire family in Palestine. / Experiences severe sleep deprivation, insomnia, and frequent nightmares. /Takes inhibitors due to Parkinson's disease.

Case 4: (F-A)

- 41-year-old Palestinian male, resident in Algeria since childhood. / Highly irritable and reacts aggressively to minor triggers. /Does not suffer from chronic illnesses or take medications.

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4. Results of the PTSD Scale for Each Case:

Case 1:

Symptoms	*Scores*	*Percentage*
Avoidant Symptoms	*1 point*	*25%*
Hyperarousal and Nervousness	*3 points*	*37.5%*
Intrusive Symptoms	*3 points*	*37.5%*
Total	*7 points*	*100%*

Case 2:

Symptoms	*Scores*	*Percentage*
Avoidant Symptoms	*1 point*	*12.5%*
Hyperarousal and Nervousness	*4 points*	*50%*
Intrusive Symptoms	*3 points*	*37.5%*
Total	*8 points*	*100%*

Case 3:

Symptoms	*Scores*	*Percentage*
Avoidant Symptoms	*20 points*	*37.73%*
Hyperarousal and Nervousness	*23 points*	*43.39%*
Intrusive Symptoms	*10 points*	*18.86%*
Total	*53 points*	*100%*

Case 4:

Symptoms	*Scores*	*Percentage*
Avoidant Symptoms	*35 points*	*42.16%*
Hyperarousal and Nervousness	*21 points*	*25.30%*
Intrusive Symptoms	*27 points*	*32.53%*
Total	*83 points*	*100%*

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5. Results of the Second Measure: Verbal Fluency:

Case 1:scored **3/3**, achieving a success rate of **100%**.

Case 2:scored **3/3**, achieving a success rate of **100%**.

Case 3:scored **1/3**, achieving a success rate of **33.33%**.

Case 4:scored **1/3**, achieving a success rate of **33.33%**

Hypothesis:

Our hypothesis states that individuals with Post-Traumatic Stress Disorder (PTSD) exhibit impairments in mental flexibility.

Discussion of the Hypothesis:

Based on semi-structured clinical interviews conducted:

- **Case 1**: Despite experiencing a traumatic event (losing 14 family members), the subject displayed mental clarity and did not show any PTSD symptoms, scoring 7 on the PTSD scale, which falls below the diagnostic threshold. Additionally, the subject achieved full marks in the verbal fluency test (**3/3**). Notably, the subject is a university student fluent in five languages, which likely contributed to resilience.
- **Case 2**: The subject, a teacher, scored full marks (**3/3**) in the mental flexibility test and was negative for PTSD.
- **Cases 3 & 4**: Both tested positive for PTSD with notable symptoms, including severe anxiety, irritability, sleep disturbances, and frequent nightmares. Their performance on the verbal fluency test was significantly weaker (**1/3**), with long pauses during the test and difficulty recalling appropriate words, despite having the knowledge. This reflects significant impairments in mental flexibility and slowed cognitive processing.

The findings reveal a strong correlation between mental flexibility and resilience to psychological trauma. In the selected sample:

- Individuals without PTSD showed high mental flexibility and linguistic competence, which might have contributed to their ability to overcome traumatic experiences.
- In contrast, those diagnosed with PTSD demonstrated clear deficits in mental flexibility.

6. CONCLUSION

Post-Traumatic Stress Disorder is a psychological condition triggered by exposure to catastrophic events. However, responses to trauma can differ greatly among individuals. The capacity to endure such events is influenced by mental resilience and coping mechanisms. Our study emphasizes the connection between PTSD and impaired mental flexibility. Although the sample size is small, the findings suggest that individuals with stronger mental flexibility were more capable of managing trauma, whereas those with compromised mental flexibility were more prone to developing PTSD.

One case in particular (Case 3) involved a patient with Parkinson's disease who also suffered from PTSD, exhibiting disturbances like irritability and sleep problems. This finding aligns with previous studies, such as Weintraub (2005), which found that dopamine replacement therapy improved some cognitive functions but not others, and Cools (1984), who observed significant difficulties in mental flexibility among Parkinson's patients.

Recommendations

To enhance mental flexibility and reduce susceptibility to PTSD, the following strategies are suggested:

- Engage in activities that strengthen memory and neural connections, such as learning new skills or languages.
- Practice deep breathing and meditation for stress relief.
- Play brain games and puzzles to promote neuroplasticity.
- Participate in social activities to foster connections and counter isolation.
- Develop skills to cope with life's uncertainties and challenges.
- Engage in activities like Quran recitation for emotional stability.
- Continuously challenge yourself with intellectual pursuits, replacing idle time with productive activities.
- Build supportive social networks to counter feelings of loneliness and depression.

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