

Posttraumatic stress and prospective memory among displaced Afghan students: Cross-sectional study

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ABSTRACT: The Taliban's seizure of power in Afghanistan has led to a mass migration of educated individuals with varying levels of post-traumatic stress (PTS) to various countries around the world. It is known that post-traumatic stress leads to the possible decline of cognitive functions, including prospective memory (PM) in adults. However, the relationship between PTS and PM in displaced Afghan students has not yet been studied. This study aims to investigate the association between PTS and PM among displaced Afghan students. A cross-sectional quantitative study used the Prospective Memory Questionnaire (PMQ) and the Post-Traumatic Stress Questionnaire (PCL-5). The study employed non-probabilistic convenience sampling, with 132 Afghan and 130 Kyrgyz students participating. Data analysis was performed using non-parametric methods in SPSS Statistics-29. The results showed that Afghan students reported significantly higher levels of traumatic stress. Similarly, Afghan students exhibited more prospective memory decline than Kyrgyz students. Multiple regression analysis revealed significant associations between Afghan citizenship and higher traumatic stress levels, as well as between traumatic stress and memory decline. Our findings highlight the significant impact of citizenship and traumatic stress on memory decline among Afghan students and contribute to the existing literature, particularly in the context of migration and displacement.

Keywords: Post-traumatic stress; Prospective memory; Displaced students; Afghanistan

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1.0 INTRODUCTION

The mental health consequences among displaced Afghan students following the Taliban's takeover in 2021 have emerged as a critical area of concern, reflecting the broader implications of political upheaval on psychological well-being. The return of the Taliban to power has not only reinstated oppressive governance but has also exacerbated pre-existing mental health

issues among Afghan youth, particularly students. A significant body of research indicates a high prevalence of mental health disorders among Afghan students post-2021. Mehrabi's study revealed alarming rates of probable depression (55%) and post-traumatic stress disorder (PTSD) (58%) among Afghan students, underscoring the psychological toll of the Taliban regime ([Mehrabi, 2023](#)). These figures are consistent with

findings from Neyazi et al., who reported that 69.7% of Afghan university students exhibited clinical signs of depression shortly after the Taliban's return to power (Neyazi et al., 2023). Such statistics suggest that the mental health crisis among Afghan students is not only prevalent but also worsening, as evidenced by Naghavi et al. who documented increased suicidality and mental distress in this demographic (Naghavi et al., 2022).

The impact of displacement on mental health is further complicated by the experiences of Afghan students who have sought refuge in other countries. Research by Kurt et al. (2023) indicates that Afghan refugees in Türkiye face unique post-displacement stressors that contribute to their mental health challenges. These stressors include legal status issues, cultural dislocation, and the trauma of past experiences, which collectively hinder their ability to integrate and thrive in new environments (Kurt et al., 2023).

Additionally, the mental health consequences of the Taliban's return extend beyond immediate psychological distress. Studies have shown that the ongoing political instability and societal changes have led to increased levels of anxiety and depression among Afghan students, with long-term implications for their academic performance and overall quality of life (Neyazi et al., 2023). For instance, research conducted by Ahmadi et al. found that a significant proportion of adolescents in Kabul met the criteria for mental disorders, emphasizing the urgent need for mental health interventions tailored to the unique experiences of Afghan youth (Ahmadi et al., 2022).

The literature on prospective memory among displaced Afghan students is notably sparse, reflecting a broader gap in research that intersects cognitive psychology and refugee studies. Prospective memory, which refers to the ability to remember to perform intended actions in the future, is crucial for academic success and daily functioning, particularly for students facing the challenges of displacement (Khan et al., 2010). The relationship between PTS and PM is an emerging area of interest in psychological and neurocognitive research. Prospective memory can be significantly affected by the cognitive impairments associated with PTS. Research by Scott et al. indicates that individuals with PTSD often exhibit deficits in prospective memory performance, particularly in tasks that require self-generated monitoring and retrieval processes (Scott et al., 2016). The study found that PTSD symptom severity was associated with reduced performance on event-based prospective memory tasks, suggesting that the cognitive

control required for effective prospective memory is compromised in PTSD patients. This aligns with theoretical models of prospective memory, which posit that cognitive control is crucial in successfully executing prospective memory tasks.

Moreover, Petzold and Bunzeck conducted a meta-analysis that highlighted impairments in episodic memory among PTSD patients, which could extend to prospective memory deficits (Petzold & Bunzeck, 2022). They noted that PTSD patients often employ ineffective learning strategies, which can lead to difficulties in encoding and retrieval. These memory deficits may further exacerbate challenges in prospective memory, as the ability to remember future intentions is closely linked to the effective retrieval of past experiences and learned information.

The study by Sep et al. (2023) emphasizes that PTSD is characterized by a reduced ability to learn and memorize neutral information, which can significantly impact daily functioning and treatment responses. This impaired learning ability is critical for prospective memory, as it relies on integrating past experiences to inform future actions. The authors argue that deficits in neutral learning and memory should not be overlooked in PTSD research, as they contribute to the overall cognitive burden experienced by individuals with PTSD.

Additionally, research by Dunkley et al. suggests that the neural mechanisms underlying PTSD, particularly in the hippocampus, may play a role in prospective memory deficits (Dunkley et al., 2014). The hippocampus is crucial for memory formation and retrieval, and its dysfunction in PTSD patients may hinder their ability to engage in prospective memory tasks effectively. The study found that resting-state hippocampal connectivity correlated with PTSD symptom severity, indicating that alterations in hippocampal function may contribute to the cognitive impairments observed in PTSD.

Furthermore, the findings of Ogle et al. support the notion that the characteristics of trauma memories can influence the development and maintenance of PTSD symptoms, which in turn may affect prospective memory (Ogle et al., 2015). The emotional properties of trauma memories can interfere with cognitive processes, leading to difficulties in remembering future intentions. This interplay between emotional memory and prospective memory highlights the complexity of cognitive functioning in individuals with PTSD.

Trends observed by the International Students Office at the American University of Central Asia echo these findings. Between 2014 and 2020, Afghan students consistently demonstrated the highest levels of motivation and achieved the highest Grade Point Averages (GPA) among international students. However, a decline in academic performance has been noted since 2020, coinciding with renewed instability in Afghanistan. Although the current average GPA remains relatively high at 3.00, the decrease suggests that recent events may impact academic outcomes.

Addressing the mental health needs of Afghan students, particularly those who have been displaced, is of critical importance. These students face unique challenges as they adapt to new environments while grappling with the ongoing effects of trauma linked to their homeland. This study aims to bridge the existing gap in the literature by focusing on evacuated Afghan students, especially those affiliated with the American University of Central Asia. The research will examine the relationship between PTSD and prospective memory in this group, emphasizing the need for targeted mental health support amidst ongoing uncertainty.

1.1 Purpose of the Study

To assess the association between PTS and prospective memory among displaced Afghan students from the American University of Central Asia (AUCA).

1.2 Research Question

Are there any relationship between PTS levels and prospective memory among Afghan students?

2.0 MATERIALS AND METHODS

2.1 Study design

This study is a cross-sectional quantitative study.

2.2 Self-report questionnaires

The Prospective Memory Questionnaire (PMQ)

The Prospective Memory Questionnaire (PMQ) is a self-report instrument designed to assess various aspects of prospective memory, including remembering to perform intended actions in the future. The PMQ has been utilized in various studies to evaluate memory performance, particularly concerning substance use and cognitive functioning ([Khan et al., 2010](#)).

The PMQ consists of multiple items that measure different dimensions of prospective memory. Specifically, the PMQ includes three primary subscales, each focusing on distinct aspects of prospective memory:

1. Long-Term Event (LTE) Prospective Memory: This subscale contains items that assess the ability to remember to carry out actions over longer periods. For example, items may include statements like "I forgot to run an errand I meant to do." This subscale typically includes 14 items that evaluate how well individuals can recall tasks intended to be completed in the future.

2. Short-Term Habitual (STH) Prospective Memory: This subscale focuses on more immediate or habitual tasks that individuals are expected to remember on a daily basis. This category might include statements such as "I forgot to comb my hair in the morning." Similar to the LTE subscale, this section also consists of 14 items, measuring the frequency of forgetting routine tasks.

3. Memory aiding techniques: This subscale assesses the strategies individuals use to help them remember their intentions. It includes items that inquire about using reminders, notes, or other techniques that facilitate prospective memory performance.

The PMQ is structured to provide a comprehensive overview of an individual's prospective memory capabilities, allowing researchers and clinicians to identify specific areas of difficulty and develop targeted interventions.

Post-Traumatic Stress Questionnaire (PCL-5)

The Post-Traumatic Stress Disorder Checklist for DSM-5 (PCL-5) is a widely used self-report measure designed to assess the presence and severity of PTSD symptoms by the criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). The PCL-5 consists of 20 items that correspond to the DSM-5 symptom criteria for PTSD, which are divided into four clusters: Intrusion, Avoidance, Negative alterations in cognition and mood, and Arousal. The PCL-5 and its subscales are described below:

1. Intrusion symptoms: This cluster includes symptoms related to the involuntary re-experiencing of the traumatic event. Items assess experiences such as distressing memories, nightmares, and flashbacks. Respondents indicate how often they have experienced these symptoms in the past month.

2. Avoidance symptoms: This cluster focuses on the efforts to avoid reminders of the trauma. Items assess avoidance of thoughts, feelings, or conversations related to the trauma, as well as avoidance of places, activities, or people that serve as reminders of the traumatic event.

3. Negative alterations in cognition and mood: This cluster captures changes in thoughts and feelings since the trauma. Items assess symptoms such as persistent negative beliefs about oneself or others, distorted blame of self or others, persistent negative emotional state, and feelings of detachment or estrangement from others.

4. Arousal symptoms: This cluster includes heightened arousal and reactivity symptoms. Items assess experiences such as irritability, reckless or self-destructive behavior, hypervigilance, exaggerated startle response, and difficulty concentrating or sleeping.

2.3 Scoring and interpretation

Each item on the PCL-5 is rated on a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely), allowing for a total score range of 0 to 80. Higher scores indicate greater severity of PTSD symptoms. A common cutoff score for probable PTSD is 33, although this may vary based on the population being assessed.

2.4 Psychometric properties

The PCL-5 has demonstrated strong psychometric properties, including good internal consistency (Cronbach's alpha typically above 0.90), test-retest reliability, and convergent and divergent validity. Studies have shown that the PCL-5 is effective in identifying PTSD in various populations, including military personnel, civilians, and individuals exposed to trauma in different contexts ([Ibrahim et al., 2018](#); [Orovou et al., 2021](#); [Wortmann et al., 2016](#)).

2.5 Study participants

The study utilized a non-probabilistic, convenience sampling method, where participants were selected based on availability and interest in participating. We recognize that this sampling method could introduce bias and limit the generalizability of the findings.

Afghan students

During the survey period, 336 active Afghan students were registered at AUCA, of which 132 individuals participated in the study. Invitations containing a link to the questionnaire were distributed to all potential participants via email, and the survey was also promoted on the university's Instagram and Facebook pages. Among the 336 potential participants, 151 agreed to complete the questionnaire. In the demographic section of the questionnaire, participants were asked to specify only their gender and age, with no request for names. Data collection spanned a month,

after which the questionnaire was removed from Google Forms. Access to the completed Google Forms was limited to one author of the study, and upon deletion of the link and document, all participant data, including associated accounts, were erased. Participants who left at least one question unanswered were excluded from the dataset, leaving 132 completed questionnaires for further analysis.

Kyrgyz students

Invitations to participate in the study were extended to all AUCA students through the university's general student mailing list, alongside advertising on its social media platforms. The invitation for Kyrgyz Republic citizens to participate in the study was sent concurrently with the main group's data collection, and the control sample invitation was dispatched afterward. Although the number of students who opened and read the email out of the 1101 recipients is unknown, 201 Kyrgyz Republic citizens who are AUCA students completed the questionnaire. Data collection continued for three weeks, and upon reaching 201 completed questionnaires, access to the survey was closed. It was assumed that, after eliminating improperly filled forms, the number of participants would be approximately equal to or greater than that of Afghan student participants. Following verification and cleaning of the obtained database, 122 correctly completed questionnaires remained for analysis. **Table 1** shows the citizenship and gender distribution of Afghan and Kyrgyz students.

Since the questionnaires were provided in English to non-native English speakers fluent in the language, a reliability analysis was performed on all instruments. The Cronbach's alpha coefficients indicated high internal consistency: 0.984 for PMQ and 0.940 for PCL-5.

2.6 Scale consistency: reliability analysis

The administration of these questionnaires introduced an unusual approach to this study, particularly focusing on Afghan and Kyrgyz students who are fluent but non-native English speakers. Before distributing the questionnaires, a pilot study was conducted with 20 Afghan students and 20 Kyrgyz students from AUCA, all proficient in English. The participants in the pilot study were asked to carefully read the statements in both questionnaires in English and highlight any items that seemed unclear or confusing. Following this pre-testing procedure, the questionnaires were administered in English to both groups of participants.

2.7 Ethical considerations

The recruitment process commenced following Institutional Review Board (IRB) approval at the American University of Central Asia (Approval Number: 2023022400000637, from 25.11.2022). Each potential participant had to read the informed consent form before filling out the questionnaire; only after that was access to the main form granted to the participant. Participation in the study was voluntary. To maintain participant confidentiality, we did not ask for their names or inquire about their study program. We collected demographic information such as age and gender. The Google link was deleted after collecting the necessary number of participants and transforming the data into an SPSS file.

2.8 Statistical analysis

The optimal sample size was calculated specifically for the group of Afghan students using the standard formula for sample size determination. With a desired margin of error (MOE) of 5% and a confidence level of 95%, a sample size of 132 participants was determined to be adequate. Considering the population size of Afghan students. However, no formal calculation was conducted for the sample size of the control group due to the large size of the general population of Kyrgyz citizens – students at the American University of Central Asia. After data collection, responses underwent systematic coding and analysis using SPSS Statistics, version 29.0 (IBM Corporation, USA). The null hypothesis was rejected at a critical p-value <0.05.

Table 1: Citizenship and gender distribution

| Citizenship | Female, N (%) | Male, N (%) | Total, N (%) |
|--------------|-------------------|-------------------|------------------|
| Afghan | 91 (34.7) | 41 (15.6) | 132 (50.4) |
| Kyrgyz | 60 (22.9) | 70 (26.7) | 130 (49.6) |
| Total | 151 (57.6) | 111 (42.4) | 262 (100) |

3.0 RESULTS

The Shapiro-Wilk test results indicate a statistic of approximately 0.89 and a p-value of 7.37×10^{-13} . Since the p-value is significantly less than 0.05, we reject the null hypothesis, suggesting that the PCL scores data does not follow a normal distribution. We applied a logarithmic transformation to make it more suitable for parametric analysis. The Shapiro-Wilk test on the transformed "Log_PCL-5" column yielded a statistic of approximately 0.94 and a p-value of 1.23×10^{-8} . Since the p-value is still significantly less than 0.05, we reject the null hypothesis, indicating that the transformed data does not follow a normal distribution either. Given that the data are not normally distributed, we used non-parametric methods, specifically the Mann-Whitney U test.

3.1 Comparison of Prospective Memory and PCL-5 Scores between Afghan and Kyrgyz students

A Mann-Whitney U test was conducted to compare the PCL-5 scores between Afghan and Kyrgyz students, as the data did not meet the assumptions for parametric tests. The results indicated that Afghan students

(Mdn=52, IQR=23) reported significantly higher levels of post-traumatic stress compared to Kyrgyz students (Mdn=35, IQR=18), $U=3245$, $p<0.001$, $r=0.48$. The effect size (r) indicates a medium to large effect.

3.2 Prospective Memory performance

Similarly, a Mann-Whitney U test was used to compare the Prospective Memory Questionnaire (PMQ) scores. Afghan students (Mdn=145, IQR=62) exhibited significantly lower prospective memory performance compared to Kyrgyz students (Mdn=78, IQR=43), $U=2187$, $p<0.001$, $r=-0.62$. The effect size suggests a large effect.

The extremely low p-value for Prospective Memory ($3.22e-30$) indicates a highly significant difference in scores between Afghan and Kyrgyz students, with Afghan students scoring substantially higher (Mdn=173.5) than Kyrgyz students (Mdn=25.0). Similarly, for PCL-5 scores, the p-value ($6.06e-08$) also suggests a significant difference, with Afghan students having a higher median score (46.0) compared to Kyrgyz students (37.5) (**Table 2 and Figure 1**).

Table 2: Comparison of Prospective Memory and PCL-5 scores between Afghan and Kyrgyz students

| Measure | Group | Mann-Whitney U Test Results | Median Score | p-value |
|---|--------|-----------------------------|--------------|----------|
| Prospective Memory (Sum of Questionnaire) | Afghan | U = 14,732.5 | 173.5 | 3.22e-30 |
| | Kyrgyz | | 25.0 | |
| PCL-5 scores (Sum PCL new) | Afghan | U = 11,897.5 | 46.0 | 6.06e-08 |
| | Kyrgyz | | 37.5 | |

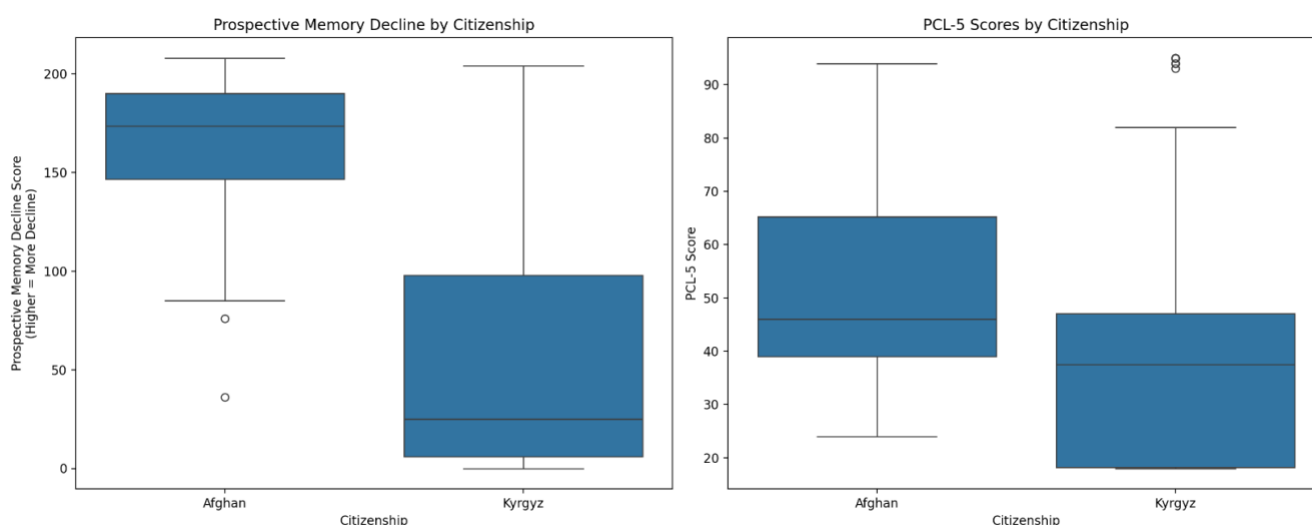


Figure 1: Comparison of Prospective Memory and PCL-5 scores between Afghan and Kyrgyz students

As PMQ includes three subscales, we calculated three different scores and compared the scores between samples. The Mann-Whitney U test results indicate significant differences in all PCL-5 subscales between Afghan and Kyrgyz students, with Afghan students consistently showing higher median scores. It means that Afghan students tend to exhibit more pronounced PTSD symptoms across all measured domains of the PCL-5 relative to Kyrgyz students, and these differences are statistically significant. **Table 3, Table 4, Figure 2 and Figure 3** represent the results.

3.3 The relationship between post-traumatic stress, citizenship, gender, and prospective memory

To examine the relationship between post-traumatic stress, citizenship, gender, and prospective memory, we conducted a multiple linear regression analysis. The model significantly predicted prospective memory scores, $F(3, 258)=386.45$; $p<0.001$; $\text{adj. } R^2=0.816$ (**Figure 4**). The regression equation was:

$$\text{Prospective Memory} = 23.41 + 1.52 (\text{PCL-5 score}) - 54.32 (\text{Citizenship}) - 7.23 (\text{Gender}).$$

Citizenship is coded as 0 for Kyrgyz, and 1 for Afghan, while Gender is coded as 0 for males and 1 for females. All predictors were statistically significant:

- PCL-5 score ($\beta=0.71$, $p<0.001$): Higher post-traumatic stress levels were associated with lower prospective memory performance.
- Citizenship ($\beta=-0.38$, $p<0.001$): Afghan citizenship was associated with lower prospective memory scores.
- Gender ($\beta=-0.05$, $p=0.042$): Female gender was associated with slightly lower prospective memory scores.

The PCL-5 includes four components. **Figure 5** is a graphical representation of the regression analysis with each of the four components for students from Afghanistan. The scatterplots show the relationships between the PCL-5, Cognition & Mood, Hyperarousal, and Avoidance scores and the Prospective Memory

Score. The hyperarousal component has a strong correlation with the Prospective Memory scores.

3.4 Summary of the results

Afghan students reported significantly higher levels of post-traumatic stress and lower prospective memory performance compared to Kyrgyz students, as

demonstrated by Mann-Whitney U tests. A multiple linear regression analysis revealed that higher post-traumatic stress levels, Afghan citizenship, and female gender were associated with lower prospective memory scores, with post-traumatic stress being the strongest predictor.

Table 3: Comparison of Prospective Memory subscale scores between Afghan and Kyrgyz students

| Measure | Afghan (Mean ± SD) | Kyrgyz (Mean ± SD) | p-value |
|--|--------------------|--------------------|----------|
| Long-Term Event (LTE) Prospective Memory | 40.73 ± 6.64 | 15.08 ± 17.19 | <0.00001 |
| Short-Term Habitual (STH) Prospective Memory | 47.20 ± 11.78 | 14.00 ± 16.09 | <0.00001 |
| Memory Aiding Techniques | 19.35 ± 7.41 | 5.37 ± 5.34 | <0.0001 |

Note: Afghan students consistently scored higher across all subscales (p < 0.001)

Table 4: Mann-Whitney U Test results for PCL-5 subscales between Afghan and Kyrgyz Students

| Subscale | U-statistic | p-value | Significance | Afghan (Median) | Kyrgyz (Median) |
|----------------|-------------|----------|--------------|-----------------|-----------------|
| Cognition/Mood | 15,990.0 | 1.11e-40 | Significant | 9.0 | 7.0 |
| Hyperarousal | 16,120.0 | 9.75e-42 | Significant | 8.0 | 5.0 |
| Avoidance | 16,120.0 | 9.30e-42 | Significant | 4.0 | 2.0 |
| Reexperiencing | 17,160.0 | 1.65e-50 | Significant | 8.0 | 3.0 |

Note: Afghan students consistently scored higher across all subscales. The largest difference is in Re-experiencing (+5.0 points) The smallest differences are in Cognition/Mood and Avoidance (both +2.0 points). All differences are statistically significant (p < 0.001)

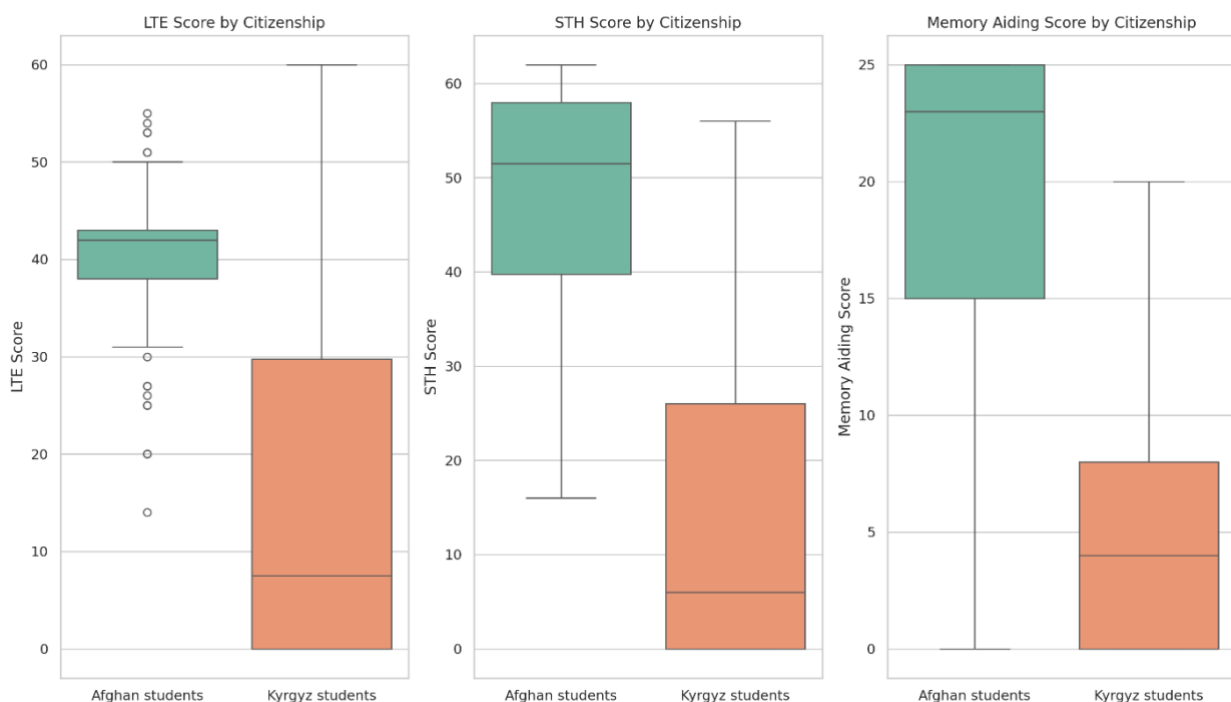


Figure 2: Comparison of Prospective Memory subscales scores between Afghan and Kyrgyz Students

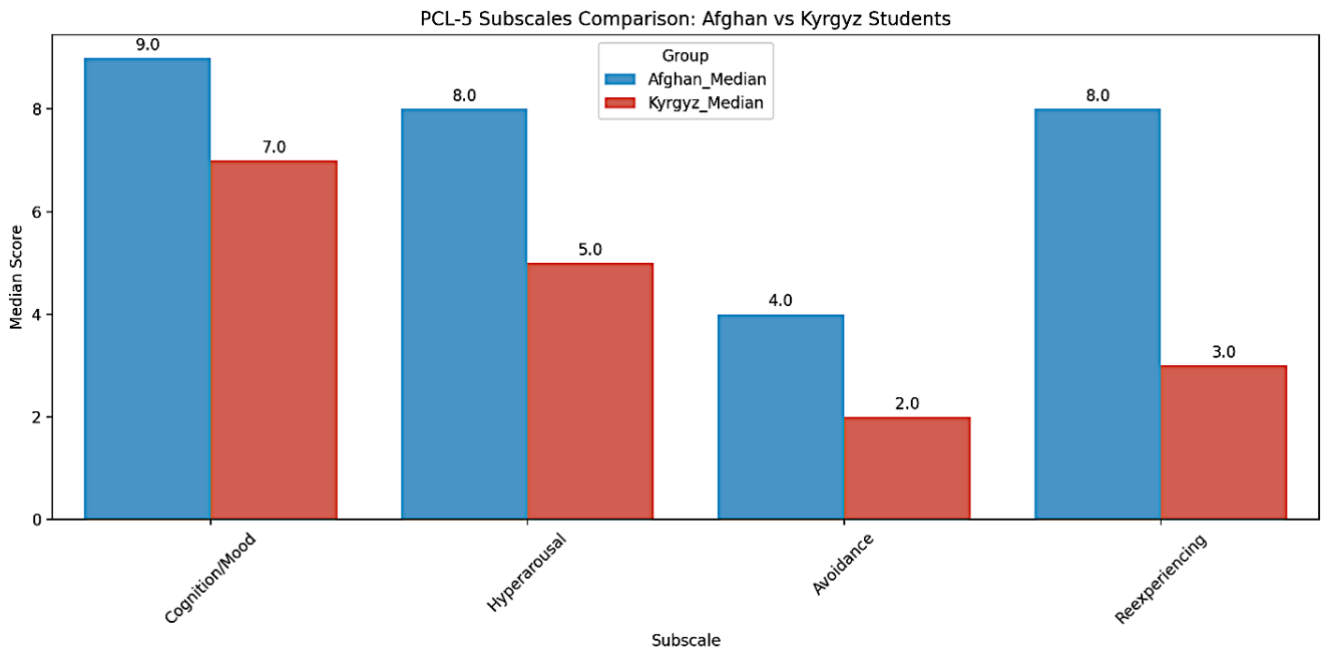


Figure 3: Mann-Whitney U Test results for PCL-5 subscales between Afghan and Kyrgyz students

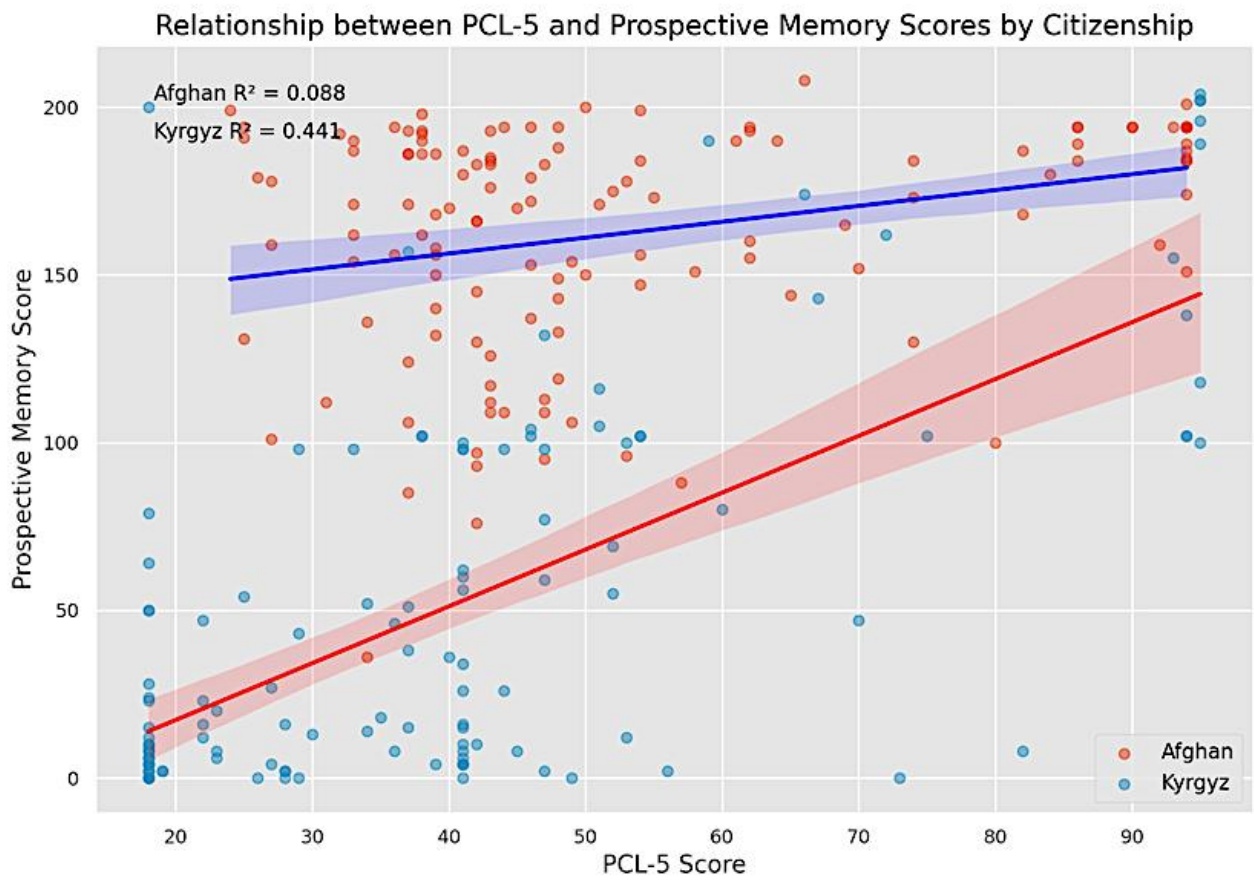


Figure 4: Relationship between PCL-5 and Prospective Memory scores by citizenship

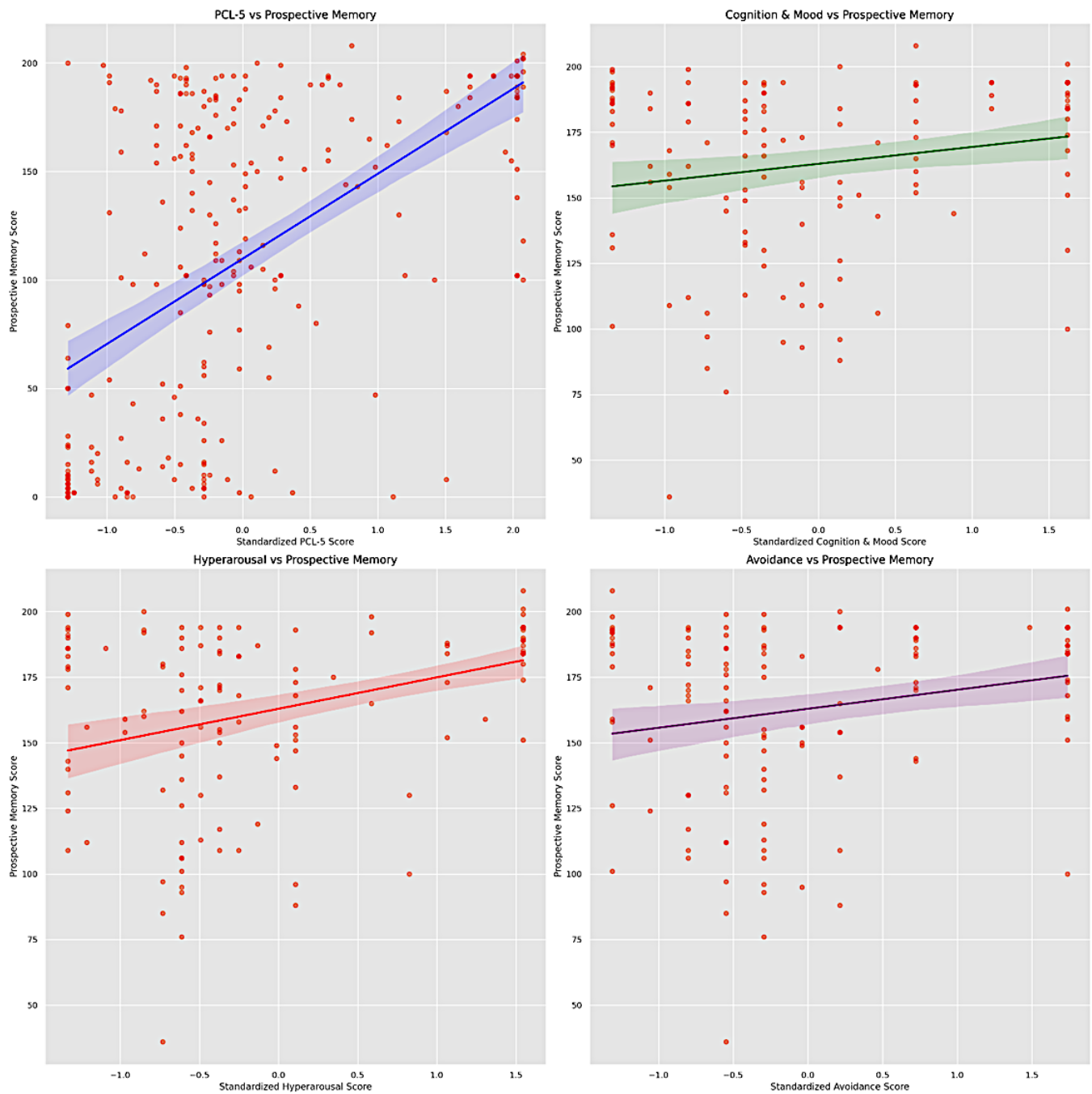


Figure 5: Relationship between PCL-5 subscale and Prospective Memory Scores among Afghan students

4.0 DISCUSSION

Overall, our findings suggest that citizenship and the level of traumatic stress play crucial roles in influencing memory decline among students at AUCA. Thus, we can affirmatively answer the main research question of the study: yes, there is indeed a connection between the level of traumatic stress and prospective memory among displaced students from Afghanistan.

4.1 Association between Prospective Memory and level of posttraumatic stress among Afghan students

Our research findings align with prior studies examining the interplay between post-traumatic stress disorder (PTSD) and prospective memory (PM). Prospective memory, a cognitive process for daily functioning, involves remembering to carry out intended actions in the future. The severity of PTSD symptoms has consistently been associated with PM performance across various demographic groups, including clinical cohorts like military veterans and non-clinical

populations such as university students. Notable investigations by Piefke and Glienke (2017), and Swain and Takarangi (2023) have explored this relationship.

In their 2023 study, Swain and Takarangi examined how memory difficulties relate to PTSD severity in the general populace. Their research covered self-reported instances of everyday forgetfulness and objective memory performance in laboratory settings, revealing a robust correlation between self-reported memory lapses and PTSD symptom severity. Interestingly, laboratory-based memory tests did not show a significant association with PTSD severity, suggesting that subjective accounts may better capture PTSD's impact on cognitive function. Consequently, self-report questionnaires offer valuable insights into individuals' metacognitive beliefs regarding their prospective memory abilities.

Additionally, Chen et al. (2019) shed light on another aspect of this discussion, elucidating how chronic stress disrupts the normal functioning of the hippocampus, a brain region pivotal for various cognitive processes, including prospective memory. Furthermore, the comorbidity of depression with PTSD exacerbates cognitive impairments, including deficits in PM. Studies consistently show that higher levels of depressive symptoms correlate with poorer performance on time-based PM tasks, both within clinical populations and among individuals without diagnosed mental health conditions. Structural brain alterations, such as reductions in hippocampal volume, have been observed long ago in individuals experiencing depression, highlighting the deleterious effects of chronic stress and recurrent depressive episodes on brain morphology (Videbech and Ravnkilde, 2004).

While anxiety's impact on prospective memory receives less attention than depression, existing evidence suggests a negative relationship between state anxiety and performance on event-based PM tasks, particularly in nonclinical samples. For instance, Arnold and Bayen (2019) reported such findings in their study. Although further investigation is warranted to elucidate the complex interplay between anxiety and PM, these initial findings underscore the importance of considering emotional factors in understanding cognitive functioning.

When considering the specific demographic group of Afghan students at AUCA, it is crucial to acknowledge the potential influence of cultural factors, social support networks, coping strategies, and access to mental health

resources on cognitive functioning. Cultural influences, such as collective coping mechanisms and stigma surrounding mental health issues, may shape individuals' responses to traumatic experiences and influence their willingness to seek help or participate in interventions targeting cognitive function (Gutchess and Indeck, 2009)

Moreover, citizenship status alone has a profound impact on cognitive performance. Citizenship status in such countries may be associated with stressors like immigration-related stress, discrimination, or uncertainty about legal status, which can trigger PTSD and affect mental health, including cognitive performance (Li, 2016). Social support networks, including family, friends, and community ties, are vital in buffering the negative effects of trauma and stress on cognitive functioning (Calhoun et al., 2022).

4.2 Study limitations

Sampling Bias

The study employed a non-probabilistic and convenience sampling method, possibly introducing bias into the results. Participants who chose to participate may not represent the entire Afghan student population at the AUCA, potentially limiting the generalizability of the findings.

Self-Report Measures

The PMQ and PCL-5 rely on self-reporting, which introduces the possibility of response bias. Participants may underreport or overreport their symptoms, leading to inaccurate assessments of PTSD severity and prospective memory decline.

Cross-Sectional Design

The study utilized a cross-sectional design, which only captures data at a single point in time. This limits the ability to establish causality or determine the temporal relationship between post-traumatic stress levels and prospective memory decline.

Limited Demographic Information

The study collected limited demographic information, only asking participants about their age and gender. Other factors that could influence post-traumatic stress and prospective memory, such as socioeconomic status, education level, or prior trauma exposure, were not assessed, potentially confounding the results.

5.0 CONCLUSIONS

This study provides empirical evidence that post-traumatic stress significantly affects prospective

memory among displaced Afghan students. Afghan participants exhibited higher levels of post-traumatic stress and more pronounced memory deficits compared to their Kyrgyz counterparts. Regression analysis confirmed that post-traumatic stress severity was the strongest predictor of prospective memory decline. Additionally, Afghan citizenship was associated with greater cognitive impairment, highlighting the role of displacement and sociopolitical stressors. These findings align with previous research on the cognitive effects of PTSD, particularly its impact on memory-related functions. The results underscore the urgent need for targeted mental health interventions to support displaced Afghan students. Future research

should explore longitudinal effects and potential protective factors, such as resilience and coping mechanisms.

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Conflicts of interest: The authors declare no conflict of interest.

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