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Human Trafficking and the Mental Health Burden of Forced Migrants in Germany

Irja Rzepka-Marot

irja.rzepka-marot@med.uni-heidelberg.de

Heidelberg University Hospital

Ivo Dönhoff

Heidelberg University Hospital

David Kindermann

Heidelberg University Hospital

Hans-Christoph Friederich

Heidelberg University Hospital

Christoph Nikendei

Heidelberg University Hospital

Estella Alejandra Tambini Stollwerck

Heidelberg University Hospital

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Abstract

Purpose: Forced migration increases vulnerability to exploitation. Globally, around 50 million people are affected by human trafficking, which often involves trauma with negative mental health effects. Forced migrants already face elevated risks of PTSD, depression, and anxiety, yet the specific impact of trafficking on their mental health remains unclear.

Methods: Symptoms of posttraumatic stress disorder (PTSD), depression, anxiety, and overall stress were assessed using standardized screening instruments (PC-PTSD-5, PHQ-4, and the Distress Thermometer). Experiences of human trafficking were measured with a modified version of the Adult Human Trafficking Screening Tool (AHTST) among forced migrants in Germany. Missing data were handled using multiple imputation. Logistic regression analyses were conducted to examine the association between human trafficking and positive screenings for the respective mental health conditions.

Results: A total of N = 1284 forced migrants participated in the study. Depending on the imputation model, between 49% and 56% of all participants screened positive for PTSD, 60% to 71% for depression, and 41% to 52% for an anxiety disorder. Among participants who screened positive for these mental health conditions, a positive screen for human trafficking was associated with a 15.4% to 20.6% higher probability of PTSD, a 15% to 20% higher probability of depression, and an 8.7% to 11.6% higher probability of an anxiety disorder.

Conclusions: Forced migrants who have experienced human trafficking are at elevated risk for PTSD, depression, and anxiety disorders, underscoring the importance of early identification and comprehensive psychosocial support tailored to this particularly vulnerable group.

1 Introduction

Forced migrants are particularly exposed to various forms of stressors before, during, or after their displacement. Pre-migration stressors can include traumatic events, such as the consequences of and living conditions with war or armed conflicts (1). The period during the flight is frequently marked by various uncertainties, including the absence of a supportive social network in the respective country, the lack of stable shelter, financial insecurity, irregular legal status, and the risk of violence (2, 3). Post-migratory stressors, such as temporary residence permit, unemployment, or living in a temporary shelter, can additionally contribute to mental distress after arriving in the country of refuge (4–7). Due to these numerous psychosocial stressors during the different of flight, the prevalence of posttraumatic stress disorder (PTSD), depression, and anxiety disorders is significantly elevated in comparison to the general population (8). While these stressors apply to refugees in general, there are also particularly vulnerable subgroups among them, such as refugees who have experienced human trafficking (9).

Human trafficking, also known as ‘modern slavery’, or ‘trafficking in persons’, is commonly defined as the recruitment, movement, or harbouring of persons by deceit, the use of threat, coercion, or the abuse of

power for the purpose of exploitation (10). It is estimated that the number of people affected by human trafficking totalled around 50 million in 2021 (11). The percentage of refugees or displaced persons within this group is unknown (9). Displaced persons face a higher vulnerability to human trafficking during all phases of their flight (9, 12). The lack of physical and social security, language barriers, illegality, and economic hardship increase vulnerability to deception by traffickers (9, 12). Accurately quantifying the number of individuals affected by human trafficking is extremely difficult due to its hidden nature, the complexity of its assessment, and the constant mobility of people during their flight (13). Additionally, victims of human trafficking might be reluctant to speak out about it due to mistrust or shame (14, 15). In Europe, it has been found that refugees are being recruited along the major migration routes, such as the Eastern Mediterranean Route or the Mediterranean Sea Route (16), and that people are being brought to their destination countries under false promises (17). However, once refugees have arrived in their destination country, the risk of human trafficking is reduced, regardless of their legal residence status (17).

Human trafficking comprises different forms of exploitation as forced labour, sexual exploitation, slavery, servitude, forced criminal activity, the removal of organs, and forced marriage (18). In a study including more than 10,000 trafficked victims collected by the International Organization of Migration (IOM), 52% of participants reported physical and/or sexual violence (19). Although women experience more sexual violence than men during human trafficking, it should be mentioned that underage males are also subjected to sexual violence (19). A systematic review found an increased risk of experiencing violence among trafficked sex workers (20). Frequently, physical violence also plays a role, such as in the context of labour exploitation, threats of violence against oneself or others, or denunciation to the police or local authorities (21). On the other hand, experiencing violence and coercion is a strong predictor for the development of PTSD, depressive symptoms, and anxiety (22). It has been shown that cumulative experiences of different forms of violence significantly increase the risk of developing symptoms of PTSD or anxiety disorders (23). The circumstances commonly inherent in human trafficking, such as repeated exposure to violence and the inability to escape, can also lead to the development of complex posttraumatic stress disorder (cPTSD) (24, 25), which is associated with even more severe functional impairments (26, 27). A 2016 systematic review identified elevated prevalence rates of psychological distress among individuals exposed to human trafficking, including anxiety (50% in women; 21.7–48.3% in men), depression (52% in women; 20.8–60.6% in men), and post-traumatic stress disorder (32% in women; 15.8–46.2% in men) (20), while a systematic review from 2022 reported that the prevalence of ICD-11 complex PTSD in this population exceeds 40% (28). Furthermore, several studies have investigated the prevalence of psychological distress according to the type of human trafficking experienced (25, 29, 30). However, in a direct comparison between victims of labour trafficking and sex trafficking, Hopper et al. reported no significant differences in the prevalence of post-traumatic stress disorder or depression (25). However, research investigating the prevalence of mental disorders in the highly vulnerable population of refugees with experiences of human trafficking remains limited.

The Europe-wide asylum system stipulates that people with “special reception needs” receive additional support (31). Special reception needs may arise in the case of experiencing human trafficking, severe

violence, or suffering from mental illness, such as trauma-related disorders. From a psychological perspective, these aspects frequently co-occur and are closely interrelated (20). In Germany, there are 50 specialized counselling centres for human trafficking that are coordinated by several organizations, such as Diakonie or Caritas (32). These centres provide comprehensive support to individuals affected by human trafficking, including psychological assistance, legal and procedural support within the framework of asylum proceedings as well as social assistance in dealing with public authorities or administrative matters (33). The coordinating network also develops and disseminates lists of indicators designed to improve the identification of persons affected by human trafficking (34). However, the identification of persons affected by human trafficking as well as individuals with mental health conditions, such as trauma-related disorders, has not been conducted in a systematic manner in Germany. Instead, identification efforts have primarily relied on raising awareness and promoting sensitization initiatives targeting staff in relevant institutions (35–37).

Although several studies have examined psychological distress and its consequences in the context of forced migration (8, 38–40), as well as different aspects influencing their mental health, such as pre- and post-migration stressors (41–44) there is, to date, no study that explicitly investigates the impact of human trafficking on mental disorders among forced migrants. This study addresses this gap by investigating the association between trafficking indicators and psychological distress and by comparing emotional well-being among forced migrants with and without signs of human trafficking. Therefore, we examined asylum seekers that were registered in an initial reception centre in Germany and assessed (a) signs of human trafficking and (b) their psychological burden. We expected participants who indicate signs of human trafficking to show a higher symptom burden with regard to PTSD, depression, and anxiety.

2 Methods

2.1 Study design and ethical considerations

This study is a prospective cross-sectional study on signs of human trafficking and the mental health burden of asylum seekers in a local state registration and reception centre. The study was approved by the local ethics committee (Ethics Committee, Medical Faculty of Heidelberg University, S249/2021; 05.05.2021) and is in line with the Declaration of Helsinki.

2.2 Setting

The Patrick Henry Village Heidelberg (PHV) is where asylum seekers are registered for the first time in the state of Baden-Württemberg, Germany. It usually accommodates between 1,000 and 3,000 newly arrived asylum seekers. During their stay at PHV, state employees verify their identity, register their personal data, and carry out a medical examination for communicable diseases as part of the asylum procedure. After a few weeks, asylum seekers are usually redistributed to further temporal accommodations (45, 46).

2.3 Participants

Participants were adult asylum seekers in the state registration and reception centre who met the inclusion criteria. Inclusion criteria were assessed at first contact and included an age of 18 years or older as well as literacy in one of the following languages: Arabic, German, English, French, Farsi, Georgian, Kurmanji, Hausa, Pashto, Serbian, Somali, Turkish, Russian, and Ukrainian. Potential participants that did not fulfil these criteria were excluded from the study. A total of 1284 people were approached to take part in the study, of which 1108 agreed to participate. This corresponds to a participation rate of 86.3%.

2.4 Procedure

At the PHV, every newly arrived asylum seeker must register in the registration and reception hall. There, we interviewed every arriving asylum seeker on Mondays, Wednesdays and Fridays from 10:00 to 16:00 from October 2022 to November 2023. After providing informed consent, the asylum seeker received a questionnaire in their own language to complete on a tablet.

2.5 Questionnaires

Each participant first answered socio-demographic questions. These included questions on age, gender, country of origin, ethnic group, religion, children, education, their reasons to escape from their country of origin, and the stressors experienced prior and during the flight. Then, the participant was screened for signs of human trafficking, PTSD, depression, and anxiety disorders.

2.5.1 Human Trafficking

The modified version of the Adult Human Trafficking Screening Tool (AHTST) was used to screen for signs of human trafficking (14). The AHTST was originally developed to identify human trafficking in America and was subsequently adapted for use with asylum seekers in Europe by Tambini Stollwerck et al. (2024) (14, 47). This is a screening instrument consisting of 9 items. Each question can be answered with yes or no. At least 6 positively answered items correspond to a positive screening for human trafficking. The adaptation study showed a positive predictive value of 27.2%, meaning that, of all positively screened people, 27.2% experienced human trafficking. The AHTST is available in 14 languages and also has individual cut-off values for different languages (14).

2.5.2 Posttraumatic Stress Disorder

The screening for PTSD was conducted using the PC-PTSD-5 (48). The PC-PTSD-5 first asks whether one or more out of six possible traumatic events has been experienced: serious fire or accident, physical or sexual assault or abuse, earthquake or flood, war, seeing someone being seriously killed or injured, having a loved one die through homicide or suicide. Then, the cardinal symptoms of PTSD, re-experiencing, hyperarousal, avoidance behaviour, are assessed in a dichotomous manner. The presence of any traumatic experience and three further positively answered questions correspond to a positive

screening. With a cut-off score of 3 out of 5 core symptoms, the PC-PTSD-5 had a sensitivity of 94.8% among a veteran's sample. The PC-PTSD-5 has a positive predictive value of 51.4% (48).

2.5.3 Depression

Depressive symptoms were assessed using the PHQ-2. The PHQ-2 is a two-item short questionnaire that captures the main criteria for major depression (49). The items are answered on a four-point Likert scale from 1 = "Not at all" to 4 = "Nearly every day". A total score of 2 or more corresponds to a positive screening, with a pooled sensitivity of 91% (50). This screening scale has a positive predictive value of 23.7% (51).

2.5.4 Anxiety disorder

Anxiety symptoms were assessed using the GAD-2. This is a two-item short questionnaire for screening for an anxiety disorder (52). The items are answered on a four-point Likert scale from 1 = "Not at all" to 4 = "Nearly every day". A total score of 3 or more corresponds to a positive screening, which, according to a diagnostic meta-analysis, has a pooled sensitivity of 76% (52). The GAD-2 has a positive predictive value of 58.0% (53).

2.6 Data analysis

The complete analysis was conducted using the 'R' statistical software (54).

2.6.1 Missing Data Analysis

Before data analysis, we examined the missing values. Sociodemographic variables had almost no missing values. For the AHTST, 10% of the items were missing. For the PHQ-2, GAD-2, and PC-PTSD-5, between 20–30% of the items were missing. It should be noted that the questionnaires were administered in the following order: sociodemographic data, the AHTST, and the psychometric questionnaires. During the entire survey, the researchers noted any peculiarities. In particular, they noted any behaviour when someone handed in an incomplete questionnaire. A review of all these notes and the structure of the questionnaire suggested three main reasons for incomplete questionnaires: disconnection because of internet problems, a lack of motivation because the questionnaire was too long, and being unsettled or disturbed by the questions. Therefore, we assumed that the unmeasured mental state was the cause of the missing values and assumed a not missing at random process (NMAR process) for the missing values. The NMAR process required a sensitivity analysis to test the robustness of our results under different assumptions for the missing data (55–58). In total, we tested three assumptions: First, we assumed that individuals with missing values are similar to individuals without missing values (MAR assumption). Next, we assumed that individuals with missing values were more likely to be burdened than individuals without missing values (NMAR 1 assumption). Finally, we assumed that individuals with missing values were less likely to be burdened than individuals without missing values (NMAR 2 assumption).

2.6.2 Multiple Imputation

For the analysis, we performed multiple imputation using the 'mice' algorithm (59). For the imputation models, we used all variables with an absolute correlation greater than 0.15 as predictors. Items were imputed using predictive mean matching and sum scores using passive imputation (60). We constructed a total of three different imputation models corresponding to the three missing data assumptions using the post-processing function of mice (60). For the NMAR 1 assumption, we added a mean of 1 to the total score of all psychometric questionnaires. In the NMAR 2 assumption, we subtracted a mean of 1 from the total score of all psychometric questionnaires. In the MAR assumption, there was no post-processing. In total, we imputed 30 datasets per NMAR assumption.

2.6.3 Analysis & Transparency

We conducted logistic regression analyses to examine the influence of human trafficking on mental distress. As required for multiple imputation, the logistic regression analysis was carried out on each imputed data set and then pooled using Rubin's rule (55, 58, 60). We did this separately for each NMAR assumption. In accordance with the mathematical gold standard, we summarize the results of all three NMAR assumptions for the interpretation of the results (55, 56, 58). Our data, the R code and our results can be viewed at the following DOI: https://doi.org/10.11588/DATA/HMVPLY. Further analyses that go beyond the focus of this manuscript can be found there. To guarantee anonymity for the participants, the date, country of origin, religion, and language have been removed from the published data. We did this to ensure adequate protection for this vulnerable group. However, the analysis described above can still be carried out.

3 Results

3.1 Sample Description

Sociodemographic data of our sample (N = 1284) can be seen in Tables 1 and 2. In our sample, 83% of the participants were male, 16% female. A total of 1% (9 participants) identified as diverse. The sample of diverse asylum seekers is too small for any statistical analysis about this group to be generalized. Participants came from 51 different countries, most of them from the West Asia region (57.1%). Women more often than men originated from Eastern Europe (19.3%), whereas men more often than women originated from North Africa (10.6%). The most frequently reported religion was Islam, followed by Christianity. For women, the most common language was Turkish, while for men it was Arabic and Turkish. The mean age of the sample was 29.25 years (SD = 9.2 years) and, on average, the participants had 0.87 children (SD = 1.28 children).

Table 1
Sociodemographic Characteristics of the Sample (N = 1284)

	Gender		
	Female	**Male**	**Diverse**
Whole Sample	16%	83%	1%
Region of Origin			
Central Africa	1.1%	0.9%	14.3%
Central Asia	9.4%	19.6%	28.6%
East Africa	2.3%	1.1%	0.0%
Eastern Europe	19.3%	7.7%	0.0%
North Africa	1.8%	10.6%	0.0%
North America	0.0%	0.1%	0.0%
South America	0.5%	0.1%	0.0%
West Africa	12.3%	12.8%	0.0%
West Asia	53.2%	47.1%	57.1%
Religion			
Atheism	2.3%	3.0%	33.3%
Buddhism	0.0%	0.3%	11.1%
Christianity	21.3%	13.3%	11.1%
Hinduism	1.1%	0.8%	0.0%
Islam	72.4%	77.4%	44.4%
Judaism	0.0%	0.2%	0.0%
Other	2.9%	5.0%	0.0%
Language			
Arabic	11.9%	27.2%	11.1%
Croatian	2.3%	0.8%	0.0%
English	5.1%	8.3%	11.1%
French	11.4%	10.3%	0.0%

Note. Percentage of Country of Origin, Religion, Language and Education sum to 100% for each gender.

	Gender		
	Female	**Male**	**Diverse**
Georgian	9.1%	3.0%	0.0%
German	0.6%	1.1%	0.0%
Hausa	0.6%	0.2%	0.0%
Kurdish	1.1%	0.8%	0.0%
Pashto	2.3%	7.8%	11.1%
Persian	10.8%	11.4%	44.4%
Russian	4.5%	2.1%	11.1%
Somali	1.7%	0.4%	0.0%
Turkish	38.6%	26.4%	11.1%
Education			
Finished School	27.3%	32.3%	11.1%
Finished University	36.9%	23.1%	44.4%
No School	9.1%	10.0%	11.1%
Went to School, did not finish	26.7%	34.6%	33.3%
Note. Percentage of Country of Origin, Religion, Language and Education sum to 100% for each gender.			

Table 2
Sociodemographic Characteristics and Psychometric Screening of the Sample

Variable	**MAR**		**NMAR 1**		**NMAR 2**	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Age	29.25	9.2	29.25	9.2	29.25	9.2
Children	0.87	1.28	0.87	1.28	0.87	1.28
AHTST (pos)	21%	41%	22%	42%	21%	41%
PC-PTSD-5 (pos)	53%	50%	56%	50%	49%	50%
PHQ-2 (pos)	64%	48%	71%	45%	60%	49%
GAD-2 (pos)	44%	50%	52%	50%	41%	49%

3.2 Human Trafficking and PTSD

Table 2 shows that, depending on the imputation model, between 49% and 56% of all asylum seekers screened positive for PTSD. In all three imputation models, a positive screening for human trafficking also had a significant influence on PTSD, as can be seen in Fig. 1. Across all imputation models, a positive screening for human trafficking increased the probability of a positive screening for PTSD by about 30–40%. Taking into account the positive predictive value of PC-PTSD-5 (51.4%), a positive screening for human trafficking was associated with an increase in prevalence of 15.4% to 20.6%.

3.3 Human Trafficking and Depression

Table 2 shows that, depending on the imputation model, between 60% and 71% of all asylum seekers screened positive for depression. In all three imputation models, a positive screening for human trafficking also had a significant influence on depression, as can be seen in Fig. 2. Across all imputation models, a positive screening for human trafficking increased the probability of a positive screening for depression by about 15–20%. Considering the positive predictive value of PHQ-2 of 27.2%, a positive screening for human trafficking was associated with an increase in prevalence of 3.6% to 4.7%.

3.4 Human Trafficking and Anxiety

Table 2 shows that, depending on the imputation model, between 41% and 52% of all asylum seekers screened positive for anxiety disorder. In all three imputation models, a positive screening for human trafficking also had a significant influence on anxiety disorder, as can be seen in Fig. 3. Across all imputation models, a positive screening for human trafficking increased the probability of a positive screening for anxiety disorder by about 15–20%. Taking into account the positive predictive value of GAD-2 of 58.0%, a positive screening for human trafficking was associated with an increased prevalence of 8.7% to 11.6%.

4 Discussion

This study analysed the psychological burden among adult forced migrants residing in an initial reception centre in Germany and examined its association with indicators of human trafficking. A total of N = 1284 participants were screened for symptoms of PTSD, depression, and anxiety disorders using the Primary Care PTSD Screen (PC-PTSD-5), the Patient Health Questionnaire-2 (PHQ-2), and the Generalized Anxiety Disorder-2 scale (GAD-2), respectively. Indicators of human trafficking were assessed using a modified version of the Adult Human Trafficking Screening Tool (AHTST) (14). Missing data were addressed through multiple statistical imputation techniques. Depending on the imputation model applied, between 49% and 56% of participants met screening thresholds for PTSD, 60% and 71% for depression, and between 41% and 52% for anxiety disorders, respectively. A positive screening for human trafficking, defined as endorsement of at least 6 out of 9 items, was associated with an increased prevalence of mental health conditions: the likelihood of PTSD increased by 15.4% to 20.6%, of depression by 3.6% to 4.7%, and of anxiety disorders by 8.7% to 11.6%.

4.1 The assessment of the mental health burden

A great variety of studies have already contributed to the understanding of the mental health burden among refugees (8, 61, 62). This study is in line with previous studies that show a higher prevalence of PTSD, depression, and anxiety disorders among migrants than in the general population (38, 63–65). Compared to other surveys among refugees, this study showed even higher prevalence of all three disorders (8). Compared to other studies on the prevalence of PTSD among refugees in Germany, an evidence mapping by Bozorgmehr, Mohsenpour (66) demonstrated substantial variability, with reported prevalence rates ranging from 6% to 75%, largely due to sample heterogeneity. Nevertheless, the mapping also showed that prevalence in population-based samples is at least 22%, and in institution-based samples at least 16%, both markedly higher than estimates for the general population. The notably increased prevalence of all three conditions may, however, also correlate with the living conditions in which these data were collected: refugees in an initial reception centre continue to have a very uncertain legal status, and their accommodation is temporary, both of which can contribute to a higher symptom burden (5, 67). In a study on the mental health of refugees conducted in the same initial reception centre, Nikendei, Kindermann (68) also found a high prevalence of positive screening for PTSD, exceeding 40%. Furthermore, screening based on self-report questionnaires generally results in higher prevalence estimates compared to assessments conducted by external evaluator (38, 69, 70). By linking these results to indicators of human trafficking, the present study addressed a gap in public health services for refugees.

4.2 Association between human trafficking and mental health burden

The results of the study indicate that a positive screening for human trafficking is associated with an increased likelihood of PTSD, depression, and anxiety disorders among refugees. Among the assessed mental health conditions, the elevated prevalence of PTSD was especially prominent, with an increase ranging from 15.4% to 20.6%. This means that the cumulative experiences indicative of human trafficking are associated with an increased risk of PTSD as well as depression and anxiety disorders among forced migrants.

In a large study of more than 1,000 participants from Southeast Asia, exposure to violence and threats, which are common experiences among victims of human trafficking, was identified as a key factor associated with higher rates of PTSD and other mental health disorders. Moreover, restricted freedom, excessive working hours, and poor living conditions were also associated with an increased risk of the mental health disorders examined in the present study (71). In addition, deception regarding salary was linked to a higher risk of developing PTSD or an anxiety disorder (71). It is well established that, in addition to traumatic events, daily stressors, such as unemployment, poverty, social isolation, overcrowded housing, and lack of security, also contribute to a higher prevalence of mental health impairment (72–74). These environmental stressors are often particularly pronounced among refugees. In light of the findings presented here, this may suggest that the living conditions associated with human

trafficking further contribute to an elevated risk of psychological distress among forced migrants. Although the various living conditions at the time of trafficking were not examined in the present study, they represent an important contextual factor that should be considered when investigating mental health in this population.

Given the high mental health burden, forced migrants who have experienced human trafficking constitute a highly vulnerable subgroup that requires particular attention. Research on symptom trajectories among trafficked women and girls indicates that PTSD symptoms often persist even after individuals exit trafficking situations (75). Untreated mental disorders may lead to reduced daily functioning (76) and an increased risk of chronicity (77). As this study was conducted in an initial reception centre, an early post-migratory phase where multiple factors are known to sustain mental disorders, early support and intervention may be critical to reducing long-term psychological consequences (41, 43, 61, 78–81). Therefore, the timely identification of affected individuals is important to enable referral to appropriate support services (82). In contexts such as initial reception centres, implementation could involve systematic screening procedures alongside awareness training for staff who engage with asylum seekers in their daily work. Following the identification of affected, highly burdened, and vulnerable individuals, establishing a trusting relationship within support systems is essential in the initial phase of needs assessment, given that the capacity to trust may be severely impaired among traumatized forced migrants (7). Beyond psychological support, adequate provision of care should also extend to medical, social, and legal domains (82, 83), as a number of studies have shown that these factors influence each other. This influence can often be negative in the case of refugees (5, 43, 84–87). A lack of social support or unmet physical needs are among the factors that can adversely affect the prevalence of mental health disorders in individuals even after their exit from human trafficking (88), which underscores the necessity of comprehensive support.

With regard to psycho-social care for survivors of human trafficking, studies have explored a range of approaches that incorporate elements of psychotraumatology with differing extents of vocational reintegration, the development of relevant skills, and reintegration into the community (82), in order to be able to rebuild an autonomous life subsequently. Psychotherapeutic approaches examined predominantly trauma-focused interventions for PTSD, such as Narrative Exposure Therapy (NET) or Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) in different settings (89). However, it is evident that further research on effective treatments is needed, as this review highlighted a highly heterogeneous body of studies primarily focusing on PTSD and specific subgroups, which limits the generalizability of the findings to other contexts. Regarding access to therapeutic care more broadly, the barriers to adequate psychosocial support affect refugees with and without experiences of human trafficking to a similar extent. In practice, the more pressing question often becomes whether psychosocial care is provided at all, rather than what form it takes (90). Nonetheless, the systematic identification of affected individuals is of critical importance to enhance awareness among service providers, to obtain comprehensive data on prevalence and to identify high-risk groups within forced migrant populations, and promote increased political recognition of the issue.

5 Limitations

This study is a cross-sectional survey of asylum seekers in which questions about human trafficking are asked retrospectively and with self-reporting questionnaires. While a strength of the study is the large number of participants from diverse countries, it should be noted that the screening questionnaires cannot provide a definitive diagnosis of mental illness. Similarly, the instrument used here cannot be regarded as a definitive measure for identifying experiences of human trafficking due to the complexity of the subject matter. Nevertheless, the screening questionnaires are highly sensitive (50, 52, 91) and the AHTST captures the presence of human trafficking-like experiences (14). Therefore, our conclusion that human trafficking–like experiences are associated with increased psychological distress, which may manifest as mental disorders, is supported.

6 Conclusion

Forced migrants who have experienced human trafficking are at elevated risk for PTSD, depression, and anxiety disorders, underscoring the importance of early identification and comprehensive psychosocial support tailored to this particularly vulnerable group.

Abbreviations

AHTST
Adult Human Trafficking Screening Tool
cPTSD
complex posttraumatic stress disorder
GAD
2-Generalized Anxiety Disorder – 2
IOM
International Organization of Migration
NET
Narrative Exposure Therapy
NMAR
not missing at random
PTSD
Posttraumatic Stress Disorder
PC
PTSD-5-Primary Care-Posttraumatic Stress Disorder – 5
PHQ
4-Patient Health Questionnaire-4
PHV
Patrick Henry Village Heidelberg
TF

CBT-Trauma-Focused Cognitive Behavioral Therapy

Declarations

Ethics Approval and Consent to Participate

The study was approved by the local ethics committee (Ethics Committee, Medical Faculty of Heidelberg University, S249/2021; 05.05.2021) and is in line with the Declaration of Helsinki. Informed consent was obtained from all participants and/or their legal guardian(s).

Consent for Publication: Not applicable.

Availability of Data and Materials

The datasets generated and/or analysed during the current study are available in the Heidelberg Open Research Data (heiDATA) repository, DOI: https://doi.org/10.11588/DATA/HMVPLY

Competing Interests

The authors have declared that there are no competing interests.

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Authors’ Contributions

ETS, CN and ID contributed to conception and design of the study. ETS carried out the study and organized the database. ID performed the statistical analysis. IRM, ETS and ID wrote the first draft of the manuscript, IRM, ID, DK, CN, HCF, ETS reviewed and edited the manuscript. All authors approved the submitted version.

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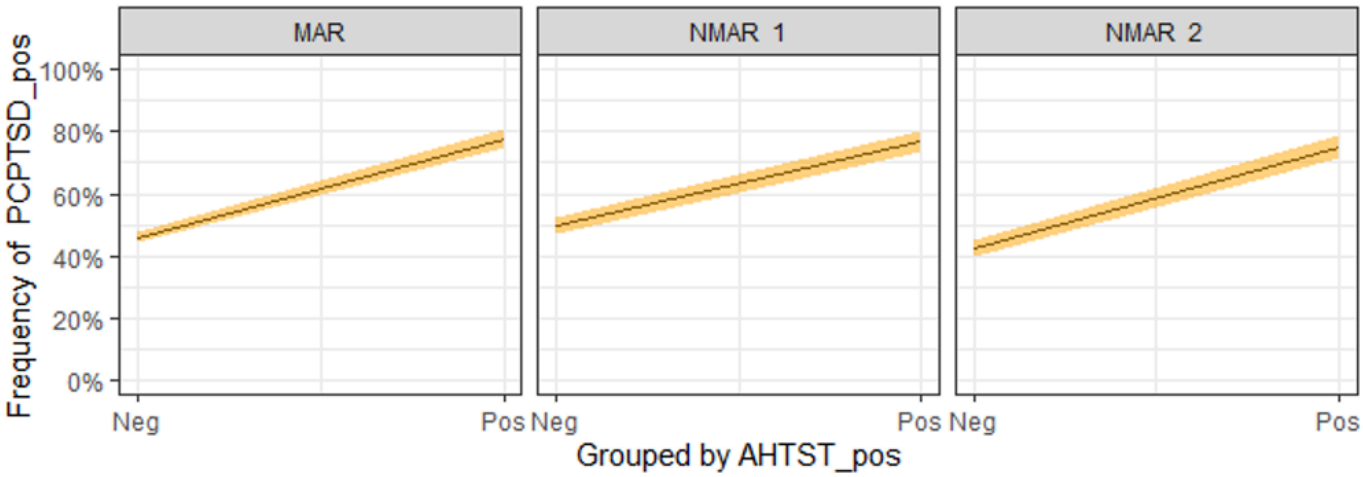
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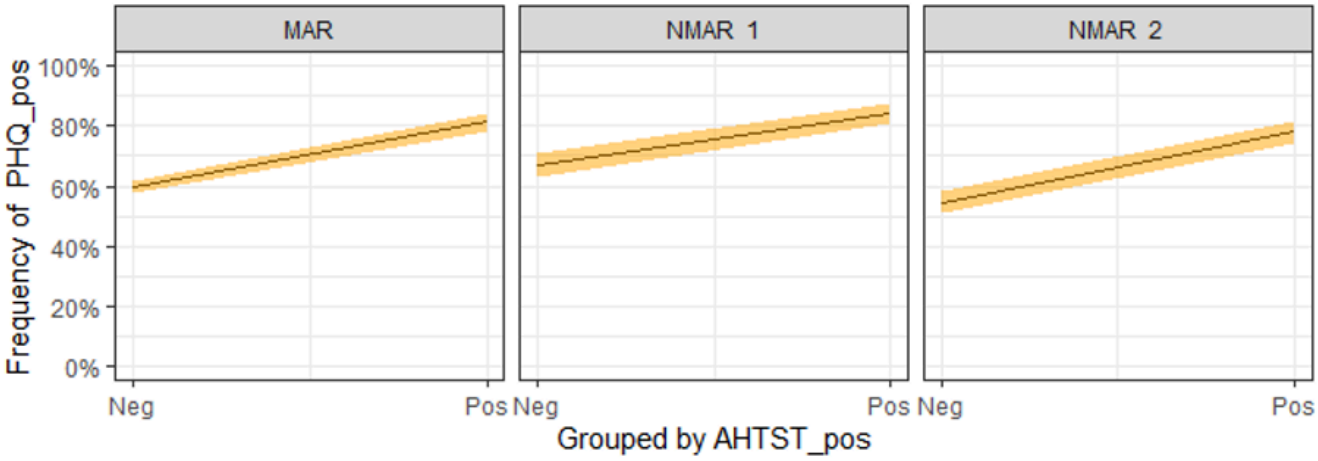
Figures



model	term	estimate	std.error	statistic	df	p.value
MAR	(Intercept)	-0.163	0.071	-2.286	801.711	0.022
MAR	AHTST_pos	1.418	0.183	7.760	623.987	0.000
NMAR 1	(Intercept)	-0.011	0.102	-0.106	80.773	0.916
NMAR 1	AHTST_pos	1.224	0.207	5.923	173.919	0.000
NMAR 2	(Intercept)	-0.304	0.117	-2.606	56.972	0.012
NMAR 2	AHTST_pos	1.418	0.183	7.767	522.432	0.000

Figure 1

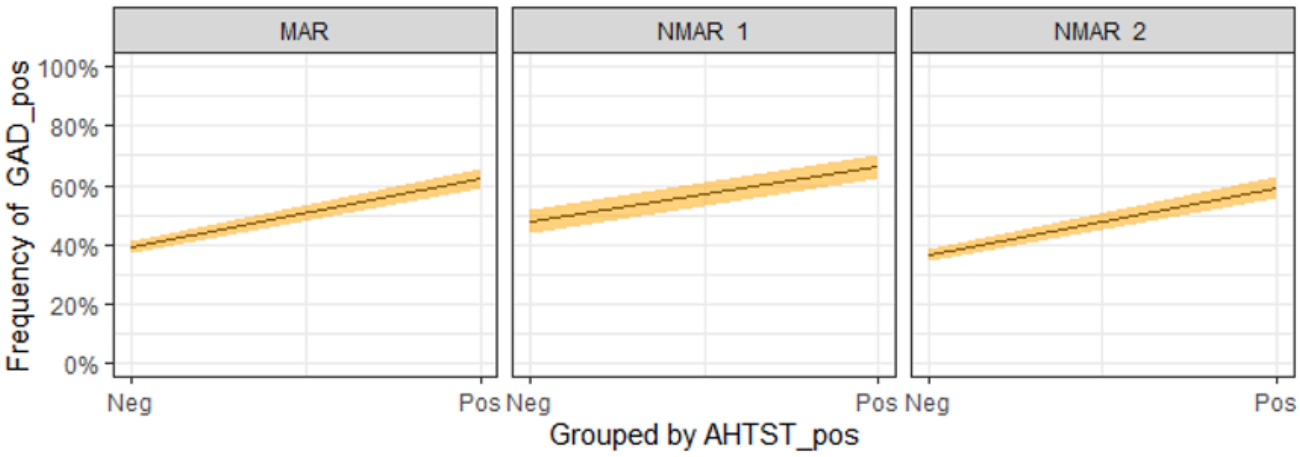
Positive screening for PTSD in case of positive screening for human trafficking



model	term	estimate	std.error	statistic	df	p.value
MAR	(Intercept)	0.395	0.077	5.132	411.234	0.000
MAR	AHTST_pos	1.077	0.201	5.365	423.143	0.000
NMAR 1	(Intercept)	0.704	0.186	3.797	32.708	0.001
NMAR 1	AHTST_pos	0.984	0.221	4.461	293.501	0.000
NMAR 2	(Intercept)	0.188	0.143	1.315	40.549	0.196
NMAR 2	AHTST_pos	1.092	0.196	5.573	372.318	0.000

Figure 2

Positive screening for depression in case of positive screening for human trafficking



model	term	estimate	std.error	statistic	df	p.value
MAR	(Intercept)	-0.439	0.076	-5.804	520.434	0.00
MAR	AHTST_pos	0.935	0.161	5.817	664.177	0.00
NMAR 1	(Intercept)	-0.094	0.159	-0.589	35.941	0.56
NMAR 1	AHTST_pos	0.767	0.173	4.441	317.386	0.00
NMAR 2	(Intercept)	-0.562	0.091	-6.192	140.867	0.00
NMAR 2	AHTST_pos	0.941	0.163	5.774	592.433	0.00

Figure 3

Positive screening for anxiety in case of positive screening for human trafficking