

Voice hearing in refugees survivors of traumatic events

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Abstract

Introduction: Voice hearing (VH) is commonly associated with psychosis but it has also been reported in PTSD. The aim of this cross-sectional study was to identify the prevalence of VH in a sample of 110 treatment-seeking trauma-affected refugees, and to examine the relative role of certain interpersonal traumatic events (i.e., torture, imprisonment, sexual assault, non-sexual assault), PTSD severity as well as a range of socio-demographic variables in the emergence of VH.

Methods: VH was operationalised in accordance with item 27 of Dissociative Experiences Scale-II. PTSD symptoms were assessed using the PTSD Checklist for DSM-5 (PCL-5). The relationship between potential predictor variables and VH was analyzed using binary logistic regression.

Results: The VH prevalence rate in our sample was 29.1%. Among traumatic events only torture significantly predicted the emergence of VH. Also PTSD severity and a higher

degree of education were significantly associated with VH.

Discussion: Our study confirms that the experience of VH is relatively frequent in refugee population surviving traumatic events. Moreover, this study suggests the construct validity of severe PTSD with VH related to specific interpersonal traumatic events such as torture. These findings have important diagnostic and therapeutic implications, as increased awareness by clinicians that VH is not uncommon in trauma-affected refugees can potentially reduce misdiagnosis, e.g., by preventing cases of PTSD from being misidentified as psychosis. It is crucial to provide health care professionals with adequate knowledge on the diagnosis and treatment of these particularly complex patterns of post-traumatic disorders in refugees, as they are increasingly present in daily clinical practice in both developing and high-income countries.”

Keywords: Voice hearing, hallucinations, PTSD, torture, refugees

Introduction

The term voice hearing (VH) refers to the experience of hearing voices in the absence of corresponding external stimuli and is considered a hallucinatory experience. According to the *Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5; Amer-*

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International Rehabilitation Council for Torture Victims.

ican Psychiatric Association [APA], 2013), hallucinations are perception-like experiences that occur without an external stimulus. They are vivid and clear, with the full force and impact of normal perceptions, and not under voluntary control. Specifically, auditory hallucinations involve the perception of sound, most frequently of voices (i.e., auditory verbal hallucinations- AVHs) but sometimes of clicks or other noises, that are not restricted to the period of awakening or the onset of sleep. AVHs are usually experienced as voices, whether familiar or unfamiliar, that are perceived as distinct from the individual's own thoughts. On the contrary, the concept of pseudohallucination was originally introduced in psychiatry to designate any hallucinatory phenomenon that does not exhibit some of the above-mentioned characteristics of hallucination. According to Karl Jaspers' characterisation (Jaspers, 1913), auditory pseudohallucinations have been defined as phenomena that, although they have all the characteristics of hallucinations, are not experienced in the outer external world as the true hallucinations but appear in subjective inner space (e.g., experiences recognised as being the person's own thoughts) (López-Silva, Cavieres, & Humpston, 2022). Although in recent years the concept of pseudohallucination has been the subject of several phenomenological, conceptual and empirically-based criticisms (van der Zwaard & Polak, 2001), auditory pseudohallucinations (e.g., having the sensory experience of hearing one's thoughts spoken in one or more different voices) are still mentioned in the DSM-5 (2013) as associated features supporting PTSD diagnosis. In a historical review of the concept of pseudohallucination, Berrios & Dening (1996) conclude that among the various critical aspects is the fact that the concept of pseudohallucination is a vicarious construct

(i.e. one created by a temporary conceptual need, and which is not associated with a biological invariant) of the hallucination one, and that the latter has proven to be much more unstable than is usually recognised. Henceforth, we will use the term VH to refer to the experience of hearing voices in the absence of external stimuli.

While VH is commonly associated with psychosis (American Psychiatric Association, 2013), there is now growing evidence that VH is not uncommon in general population, and is not necessarily an indicator of psychopathology (Baumeister, Sedgwick, Howes, & Peters, 2017; Linscott & van Os, 2013). In this regard, several large-scale investigations have identified rates of up to 16% lifetime prevalence of VH in adult nonclinical community populations (Longden, Madill, & Waterman, 2012). On the other hand, this experience has also been reported by several studies on non-psychotic mental health conditions including trauma-related disorders (Crompton, Lahav, & Solomon, 2017; Jessop, Scott, & Nurcombe, 2008) and dissociative disorders (Dell, 2006; Middleton & Butler, 1998). While the exact pathophysiology underlying VH remains unknown in both psychosis and non-psychotic conditions, VH in trauma-related disorders have been conceptualised predominantly as a dissociative phenomenon (Brewin & Patel 2010; Dell, 2006; Longden, Madill, & Waterman, 2012)). Existing data in the literature on prevalence rates of VH in trauma-related disorders vary widely depending on the VH operational definition/description, on how VH is measured as well as on differences in patient samples. VH has been reported in 13.9-59.6% of patients with PTSD related to military combat (Anketell et al., 2010; Brewin & Patel 2010; Butler, Mueser, Sprock, & Braff, 1996; Crompton, Lahav, & Solomon, 2017; David, Kutcher, Jackson, & Mellman, 1999; Hamner, Frueh, Ulmer, & Arana, 1999;

Mueser & Butler, 1987; Wilcox, Briones, & Suess, 1991), and in 5-85% of civilian samples with PTSD (Anketell et al., 2010; Brewin & Patel 2010; Clifford, Dalgleish, & Hitchcock, 2018; Scott, Nurcombe, Sheridan, & McFarland, 2007). Indeed, there are currently few investigations on VH in the civilian population with PTSD and even fewer among refugees. On the other hand, studies of VH in refugee populations are needed for several reasons. First, this population is exposed to a high number of prolonged interpersonal traumatic events and the consequent risk to develop severe trauma-related psychopathology (Fazel et al., 2005; Palic, Kappel, Nielsen, Carlsson, & Bech, 2014; Steel et al., 2009;). Studies on the prevalence of PTSD in refugees worldwide have found a prevalence between 10–30% (Fazel et al., 2005; Steel et al., 2009). Second, over the past decade, the global population of forcibly displaced people has been drastically growing from 51.2 million in 2013 to 108.4 million in 2022, reaching a record high (UNHCR, 2023). Moreover, refugees present different characteristics than war veterans and the general civilian population since they have to start a new life in a different environment after exposure to trauma, which often involves a new environment with a new culture/society/language and lack of support from surrounding family and friends (Carlsson, Sonne, & Silove, 2014; Kessler et al., 2014). To date, only three studies have investigated VH among trauma-affected refugees showing that this symptom is relatively common in treatment-seeking refugees although its etiology is still poorly understood. In a sample of trauma-affected refugees with PTSD, Nygaard, Sonne, & Carlsson (2017) found that 27.1% of patients reported auditory hallucinations. The PTSD group with auditory hallucinations and other secondary

psychotic features (i.e. delusions and other hallucinations) included significantly more patients exposed to torture ($P = 0.001$) and imprisonment ($P = 0.005$). This is consistent with several case studies (Norredam, Jensen, & Ekstrøm, 2011; Pinto & Gregory, 1995; Wenzel, Kieffer, & Strobl Wenzel, 1999) and quantitative studies (Kucukalić, Bravo-Mehmedbasić, & Dzubur-Kulenović, 2004; Wenzel, Griengl, Stompe, Mirzaei, & Kieffer, 2000) that have described co-occurrence of PTSD and auditory hallucinations in patients who survived torture. In another sample of PTSD refugee patients from the same outpatient clinic as the previous study, Rathke, Poulsen, Carlsson, & Palic (2020) found an auditory hallucinations prevalence rate of 22.4%. Neither torture, nor other war-trauma (ex-combatant, imprisonment, civilian war trauma) predicted PTSD with psychotic symptoms (i.e., auditory and visual hallucinations and persecutory delusions) but comorbid depression did. In a third study on trauma-affected Cambodian refugees, auditory hallucinations rate was rather different (i.e., 42% in the overall sample and 67% in the PTSD group), but in this case not only the auditory hallucinations heard in wakefulness but also those perceived in falling asleep and waking were counted (Hinton, 2021).

The aim of the present study was to identify the prevalence of VH in a sample of treatment-seeking trauma-affected refugees, and to examine the relative role of torture and some other interpersonal traumatic events (i.e., imprisonment, sexual assault, non-sexual assault) as well as PTSD severity and a range of socio-demographic variables in the emergence of VH. Based on existing evidence, we hypothesised that: (a) our sample would present a relevant prevalence of VH; (b) torture would predict the emergence of VH.

Material and methods

Participants

This study was approved by the Ethics Committee of the School of Cognitive Psychotherapy of Rome (Italy). Before attending the study session, participants first completed written informed consent. The data for these analyses were obtained as part of an initial routine assessment of 110 refugees and asylum-seekers who were seeking treatment and psycho-social support for trauma-related mental health disorders at 3 outpatient units: the two clinical units for victims of torture managed by the humanitarian organisation MEDU (Doctors for Human Rights, Italy) in Rome (MEDU Psych Center) and Ragusa (Italy), and the psychological service in the reception center for asylum seekers (CARA) in Bari (Italy). To be eligible for the study participants were required to: a) be a refugee or an asylum seeker, b) be over the age of 18, c) be in the initial clinical assessment phase and d) be able to speak fluently one of the study languages (English, French, Arabic, Spanish). Exclusion criteria were the presence of a primary psychotic disorder and a bipolar disorder diagnosis, alcohol or drug abuse and the inability to complete the PTSD symptoms or the trauma exposure questionnaires due to mental disability. Of the 151 patients considered eligible for the study, 21 did not complete the PTSD symptoms or the trauma exposure questionnaires (amongst them, some were transferred to reception centers located in other cities [$n=15$], some others left the reception centers autonomously [$n=6$] before finishing the evaluation sessions) and therefore they were not included in the sample. The final sample size was 110 participants. Gender ($\chi^2 = .78$, $p = .51$) and age (two sample t-test; $p = .19$) distribution of the 21 patients not included did not show significant differences with the

sample group of this study. Data was collected between March 2016 and October 2022. The sample comprised 78 men (70.9%) and 32 women (29.1%). Participants in this study had a mean age of 28.6 years ($SD = 7.05$) and they had lived in Italy for a mean of 14.5 months ($SD = 17.5$). Participants were from 33 Countries spread across West Africa ($n = 63$, 57.3%), North Africa ($n = 21$, 19.1%), South Asia ($n = 7$, 6.4%), Central Africa ($n = 7$, 6.4%), East Africa ($n = 4$, 3.6%), Middle East ($n = 5$, 4.5%), South and Central America ($n = 2$, 1.8%).

The majority of participants were unemployed ($n = 100$, 90.9%) with a mean of 7.92 years of education ($SD = 4.96$; range 0-18 years). Regarding legal status, only 14.5% ($n = 16$) of the participants got a residence permit for international protection (i.e. refugee or subsidiary protection status), humanitarian protection or for employment, while the majority were still asylum seekers ($n=94$, 85.5%). Regarding residence, participants were hosted in one of these three types of residences: 1) large reception centers with over 800 guests ($n = 49$, 44.5%); 2) medium to small reception centers with less than 400 guests ($n = 55$, 50.0%); and 3) other small reception facilities ($n = 6$, 5.5%).

Procedure and measures

Measures were administered within a clinical setting as a standard clinical assessment. Participants provided sociodemographic details first, after which they completed, in the following order, the PCL-5 scale, the trauma exposure questionnaires and the DES Item 27. The translated versions of the questionnaires were read out loud for the participants to avoid possible reading disabilities. Participants listened to each item and possible responses in the study languages (i.e. Arabic, English, French, Spanish). Participants then

vocalised their response. The research assessment lasted about 60 to 90 minutes. Participants were assisted by a team which included a trained interpreter/cultural mediator, a medical doctor and/or a clinical psychologist with a minimum of 3 years' experience in mental health work with refugees.

PTSD: We assessed symptoms of PTSD using the PTSD Checklist for DSM-5 (PCL-5; Weathers et al., 2013; Cronbach's $\alpha = .86$ [0.83 - 0.89]). The PCL-5 is a 20-item self-report measure that assesses the 20 DSM-5 symptoms of PTSD. Items are rated on a five-point scale (0 = *not at all*, 1 = *a little bit*, 2 = *moderately*, 3 = *quite a bit*, 4 = *extremely*) and a symptom is considered endorsed if the corresponding item has a score ≥ 2 . A probable diagnosis of PTSD was made on the basis of the PCL-5 cut-off score ≥ 33 (Bovin et al., 2016) and/or according to

the DSM-5 criteria which requires at least the endorsement of: one item from Cluster B (questions 1-5), one item from Cluster C (questions 6-7), two items from Cluster D (questions 8-14), two items from Cluster E (questions 15-20) (APA, 2013). The PCL-5 has been shown to be valid in both western (Bovin et al., 2016) and non-western populations (Ibrahim, Ertl, Catani, Ismail, & Neuner, 2018; Verhey, Chibanda, Gibson, Brakarsh, & Seedat, S, 2018).

Trauma exposure: We assessed trauma exposure using a 23-item instrument developed by Nickerson and colleagues (2016). This scale represented the compilation of trauma event lists from two standardised questionnaires, namely the Harvard Trauma Questionnaire (HTQ) (Mollica et al., 1992) and the Posttraumatic Diagnostic Scale (PDS) (Foa, 1996; Foa, Cashman, Jaycox & Perry, 1997).

Table 1. Descriptive Statistics of the group with VH (n=32) and the group without VH (n=78)

Covariate	Full sample N = 110		VH n =32		NO-VH n = 78	
	Mean	SD	Mean	SD	Mean	SD
Years of education	7.92	4.96	9.75	4.92	7.17	4.96
Age	28.49	7.05	28.75	7.50	28.38	7.05
Number of trauma types	8.72	3.82	7.81	3.78	9.10	3.94
Gender	M = 78 (70.9%) F = 32 (29.1%)		M = 23 (71.9%) F = 9 (28.1%)		M = 55 (70.5%) F = 23 (29.5%)	
Torture	93 (84.5%)		30 (93.7%)		63 (80.8%)	
Imprisonment	87 (79.1%)		26 (81.2%)		61 (78.2%)	
Non-Sexual Assault	84 (76.4%)		22 (68.7%)		62 (79.5%)	
Sexual Assault	35 (31.8%)		15 (46.9%)		20 (25.6%)	
PTSD diagnosis	94 (85.4%)		30 (93.7%)		64 (82.1%)	
Mean PTSD symptoms score	43.84	12.93	47.97	13.14	42.15	12.93

This scale indexed exposure to 23 traumatic events commonly experienced by refugees. Participants were asked to indicate whether they had experienced or witnessed any of the events personally. Overall trauma exposure was represented by a count of the number of traumatic event types each participant experienced (possible range: 0–23). In order to operationalise the concept of torture, this study refers to the definitions contained in articles 1 and 16 of the Convention Against Torture and other Cruel, Inhuman or Degrading Treatment or Punishment (UN General Assembly, 1984). Before responding to the questionnaire, participants were informed about the definition of torture used in this study.

Voice hearing: We assessed VH experience using the Item 27 of the Dissociative Experiences Scale-II (DES-II; Carlson & Putnam, 1993). The Dissociative Experiences Scale (DES-II) is a 28-item self-report instrument and widely used clinical tool to measure dissociation. VH is included as Item 27 on the DES-II: “Some people sometimes find they hear voices inside their head that tell them to do things or comment on things they are doing. Circle a number (0–100) to show what percentage of time this happens to you.”. The symptom was considered endorsed if the item had a score ≥ 20 . The participants were asked how often they had this experience in the last month when they were not under the influence of alcohol or drugs and whether this experience occurred while awake or if they were restricted to the period of awakening or the onset of sleep. The symptom was considered endorsed only if experienced while fully awake. The DES-II has been shown to be valid in both western (Lysenko et al., 2018) and non-western populations (Al-Eithan, Al Juban, & Robert, 2013).

Data analysis

All statistical analyses were conducted in SPSS

Table 2. Trauma Exposure Reported by Participants.

Trauma Type	n	%
Torture	93	84.5
Imprisonment	87	79.1
Lack of food or water	86	78.2
Non-sexual assault	84	76.4
Being close to death	64	58.2
Lack of shelter	57	51.8
Ill health without access to medical care	56	50.1
Disappearance or kidnapping	55	50.0
Murder of one or more strangers	51	46.4
Unnatural death of a family member or friend	40	36.4
Forced separation from family member	37	33.6
Murder of a family member or friend	34	30.9
Sexual assault by a stranger	33	30.0
Enforced isolation from others	28	25.5
Non-sexual assault by a family member or someone you know	25	22.7
Combat situation	24	21.8
Serious physical injury	19	17.3
Serious accident. fire or explosion	18	16.4
Life-threatening illness	17	15.4
Sexual assault contact when you were younger than 18 with someone who was 5 or more years older than you	16	14.5
Sexual by a family member or someone you know	14	12.7
Brainwashing	13	11.8
Natural disaster	1	0.9

Table 3. Logistic regression with VH as outcome variable

	B	S.E.	Wald	Df	OR	95% CI		p
						Lower	Upper	
Gender (M)	.111	.734	.023	1	1.118	.265	4.709	.879
Age	-.082	.043	3.557	1	.921	.846	1.003	.059
Years of education	.222	.072	9.460	1	1.248	1.084	1.437	.002
PTSD severity (PCL-5 score)	.060	.023	7.011	1	1.062	1.016	1.110	.008
Torture	2.698	1.092	6.101	1	14.846	1.745	126.272	.014
Imprisonment	.630	.775	.660	1	1.877	.411	8.581	.417
Non-sexual assault	-.786	.586	1.799	1	.456	.144	1.437	.180
Sexual assault	.783	.658	1.418	1	2.188	.603	7.938	.234
Constant	-5.811	1.865	9.709	1	.003			.002

R² = .322 (Nagelkerke);

χ^2 (8) = 3.416 (Hosmer & Lemeshow), p = .906.

Model: χ^2 (8) = 28.089, p = .000.

Overall accuracy rate = 75.5

22 (IBM, 2013). The relationship between some traumatic experiences (i.e., torture, imprisonment, non-sexual assault and sexual assault), PTSD severity, socio-demographic variables and VH was analyzed using binary logistic regression.

Results

Exposure to Trauma, PTSD and VH prevalence rates

Descriptive statistics of our sample are showed in table 1. The sample was highly trauma exposed as the participants had been exposed to a mean of 8.72 (SD = 3.82) types of traumatic events including torture (84.5%; n = 93), imprisonment (79.1%; n = 87), non-sexual assault (76.4%; n = 84) and sexual assault (31.8%; n = 35). All the participants were survivors of at least one interpersonal traumatic event in their country and/or in the migratory route (see table 2 for frequency of exposure to specific trauma types). According

to the DSM-5 criteria, the participants with PTSD were 85.4% (n=94) of the sample. According to the item 27 of the DES-II, the VH prevalence rate was 29.1% (n=32). The rate of VH was 31.9 % (n=30) among participants with PTSD and was 12.5% (n=2) among participants without PTSD.

Association of trauma types, PTSD severity and socio-demographic variables with VH

The full results of the logistic regression are presented in Table 3. According to our hypothesis, torture significantly predicted the emergence of the VH. Also PTSD severity and a higher degree of education were significantly associated with VH. The Nagelkerke R squared value was equal to 0.322 with an overall accuracy rate of 75%

Discussion

The sample of this study consisted of treatment-seeking trauma-affected refugees. The VH rate in the in the overall sample was

29.1% while in the PTSD group was 31.9%. Although this is consistent with two previous studies on treatment-seeking refugees with PTSD in which the rates of VH were 27.1% (Nygaard, Sonne, & Carlsson, 2017) and 22.4% (Rathke, Poulsen, Carlsson, & Palic, 2020) respectively, differences in the VH operational definition/description and measurement must be considered. In our study, the VH description was operationalised as a dissociative experience according to item 27 (“*Some people sometimes find they hear voices inside their head that tell them to do things or comment on things they are doing*”) of the DES-II. In the other two studies VH was conceptualised as auditory hallucinations, although the definition of auditory hallucinations was not explicitly described and their measurement was based on the patients’ psychiatric records where psychotic symptoms (i.e., hallucinations and delusions) were assessed on the basis of chapters 16–19 of the Schedules for Clinical Assessment in Neuropsychiatry (SCAN), a semi-structured clinical interview (Rijnders et al., 2000). In another study on treatment-seeking trauma-affected refugees (Hinton, 2021), VH rate was rather different, namely 42% in the overall sample and 67% in the PTSD group. The sample consisted of Cambodian refugees survivors of the Khmer Rouge genocide and VH was conceptualised as auditory hallucinations. Patients were asked whether they had heard any sounds that scared them like a voice calling them or some other sound, and then to describe the sound so that the clinician could ascertain whether it was an auditory hallucination. Notably, auditory hallucinations were heard most often during hypnagogia and/or hypnopompia (i.e., upon falling asleep or awakening) which, according to the DSM-5, is an exclusion criterion for the operational definition of auditory hallucination. Indeed, among patients with auditory

hallucinations, only 46% experienced them when fully awake. Although the authors do not specify what the rate of AH experienced when fully awake among PTSD patients is, it is likely that it is consistent with previous studies on refugees. With regard to non-refugee adult civilian population samples, the few studies found rather discordant VH rates. In a study on 30 patients with PTSD arising primarily from adulthood trauma (50% also reported history of childhood trauma), Brewin & Patel (2010) found a VH rate of 67.0%. VH measurement was through a semi-structured interview developed by the authors. Individuals were first asked about the presence of repetitive thoughts (“a stream of thoughts that repeats a very similar message over and over again inside your head”), and if so whether the individual experienced this as a voice vs. a stream of thoughts. All patients who heard voices regarded them as manifestations of their own thoughts and based on this, the authors conceptualised VH as auditory pseudohallucinations. Anketell et al. (2010) evaluated a mixed sample of general psychiatric outpatients and those who had experienced conflict-related trauma and found that 50% of their sample with chronic PTSD reported VH. In a sample of adult survivors of physical and sexual trauma with chronic PTSD, Clifford, Dagleish, & Hitchcock (2018) administered both the item 27 of the DES-II for measuring VH and the Brewin & Patel’s semi-structured interview. Notably, in their PTSD sample, 32.5% answered positively to Item 27 of the DES-II, a rate very similar to that found in the PTSD group of our study. When the question (i.e., “*Have you been aware in the past week of a stream of thoughts that repeats a very similar message over and over again inside your head?*”) was presented within a semi structured interview, 45% of the PTSD group endorsed such experiences. However, when probed as to

whether they experienced this “*as a voice or a stream of thoughts*”, only 5% of their sample reported VH conceptualised by the authors as an auditory pseudohallucination. Jamieson et al. (2021) criticised the definition of pseudohallucinations used in this study also because the authors used a semi-structured interview instrument that initially asked whether the participant had experienced a very specific and repetitive form of hallucinatory experience. Participants were only asked about hearing the voice if they had approved this initial question and this may have led to an underestimation of the prevalence in this population. Moreover, the semi-structured interview had not been used in previous studies except Brewin and Patel (2010) and there was therefore limited information on how traumatised participants might interact with and experience this interview. Although the pathophysiological and phenomenological nature of VH in the civilian population with PTSD remains undefined, our study confirms what most previous research has found, namely that the experience of VH is relatively frequent in the refugee population. This has important diagnostic and therapeutic implications, as increased awareness by clinicians that VH is not uncommon in trauma-affected refugees can potentially reduce misdiagnosis, for example by preventing cases of PTSD from being misidentified as psychosis. This risk may be particularly significant in the case of refugees and immigrants as communication between patients and clinicians is often hindered by language and cultural barriers, which in turn may foster difficulties in symptom assessment and misdiagnosis (Adeponle, Thombs, Groleau, Jarvis, & Kirmayer, 2012; Kirmayer, Groleau, Guzder, Blake, & Jarvis, 2003). With regard to treatment, it is particularly important to remember that to date, unlike in psychotic disorders, there is no evidence to recommend antipsychotic drugs

for PTSD with secondary psychotic features such as auditory hallucinations and delusions (Compean & Hamner, 2019). On the other hand, a correct and timely diagnosis will allow the appropriate trauma-focused psychotherapeutic and pharmacological treatments to be set up and will reduce the risk of chronicisation.

We also sought to evaluate the relationship of certain interpersonal traumatic events often experienced by refugees, PTSD severity as well as a range of socio-demographic variables with the VH experience. Coherently with our hypothesis, our findings suggest that torture may be relevant to the development of the experience of VH. This is in agreement with Nygaard and colleagues (2017) conclusions. Conversely, the other types of interpersonal traumatic events tested in this study (i.e. detention, non-sexual assault and sexual assault) do not seem to significantly predict VH. In our study, the severity of PTSD symptoms also seems to significantly predict the occurrence of VH. These two latter findings suggest the construct validity of a severe type of PTSD with VH related to specific interpersonal traumatic events such as torture. This is in contrast to some previous studies on individuals with combat trauma PTSD (David, Kutcher, Jackson, & Mellman, 1999; Hamner, 1997) and mixed trauma PTSD (Anketell et al., 2010), in which PTSD severity was not associated with the presence of psychotic symptoms including auditory hallucinations. On the other hand, another study on combat veterans with PTSD but without a primary psychotic disorder, found that in the group of patients with psychotic features (i.e., mainly auditory and visual hallucinations and delusions), a more severe psychosis ratings corresponded to a more severe PTSD disease burden (Hamner, Frueh, Ulmer, & Arana, 1999).

In our sample also a higher degree of education was significantly associated with VH. This is an unexpected finding with no reference in the limited previous literature on the subject. We can only preliminarily hypothesise that a higher degree of education may have corresponded with a greater awareness of the presence of the VH symptom and a bio-psychosocial explanation of the phenomenon, which may have been associated with a greater help-seeking and symptom disclosure attitude. Conversely, a condition of illiteracy or a very low degree of education may have led to a disclosure bias, that is, a certain degree of reticence in declaring a phenomenon (i.e., VH) that may have been regarded by the patient as having a magical or religious origin and therefore little comprehensible to Western clinicians unfamiliar with their culture. A recent narrative review by Ghanem, Evangeli-Dawson & Georgiades (2023) on the phenomenology and explanatory models of hallucinations and delusions across cultures, found that patients who endorsed a bio-psychosocial explanation of their symptoms tended to be more help-seeking than patients endorsing other explanatory models. According to this study, Asian and Latino patients endorsed mainly religious-spiritual explanatory models, while African patients opted for a bewitchment model, seeking help initially through traditional faith healers. Despite this, a recent study showed that the majority of African students at one of Nigeria's most multi-ethnic universities suggested help-seeking according to the bio-psychosocial (i.e., mental health professionals) for hallucinations and delusions during psychosis, with only 10% suggesting religious help-seeking (Aluh, Okonta, & Odili, 2019). Increasing levels of study were associated with better parameters of mental health literacy. This could suggest that a higher level of education may correspond to a greater willingness to disclose

one's voice hearing symptom to mental health professionals and seek their help. Either way, the findings of the present study should be interpreted cautiously and need replication in a larger series of patients.

Our findings should be considered in the context of several limitations. Our sample of trauma-affected refugees represents a culturally diverse and heterogeneous group. They are probably broadly representative for refugees seeking treatment in European countries, but not for refugee populations in general. Although both PCL-5 and DES-II have been shown to be valid in non-western populations, there may have been cultural differences in the description and interpretation of symptoms and experiences, as participants in this study had a wide variety of cultural backgrounds from Africa to Asia and Latin America. Indeed, construct validity of posttraumatic and dissociative symptoms are to some degree limited in non-western patients, when using instruments developed for western populations. At this regard, the use in this study of trained interpreters allowed to enhance a culturally appropriate understanding of the patient's experiences (Skammeritz, Sari, Jiménez-Solomon, & Carlsson, 2019). Nonetheless, while the relevance of culture and religion in shaping hallucinatory experiences is well known (Larøi et al., 2014), this study has the limitation of not specifically investigating the impact of culture and religion in the emergence of VH. Furthermore, this study entailed secondary analysis of existing data, and the data were not collected from all patients consecutively admitted to or evaluated at our 3 outpatient units. Thus, the total sample in our denominator may not be fully representative of trauma-affected refugees, let alone trauma-affected refugees at our 3 outpatient units. On the other hand, as the primary aims of administering the questionnaires is for the purpose of a routine clinical

assessment, there was no active bias to deliberately seek out voice hearing individuals for recruitment. Another major limitation is that our sample of 110 patients is small, and the proportions we observed in our study may not necessarily reflect the true prevalence of VH, which would be best estimated by largescale, population-based epidemiological studies. On the other hand, a sample size of 110 is relatively large in the scope of the existing literature on voice hearing among trauma-affected refugees. Moreover, VH was operationalised in this study in accordance with the narrow definition of item 27 of DES-II and therefore it is likely that not all VH experienced by participants was actually detected. Indeed, this study investigated VH exclusively from one perspective (i.e., dissociation) without claiming to address all multiple pathways of such a complex phenomenon that encompasses both psychopathology and non-clinical population. Finally, we did not examine depression, which is often found in co-morbidity with PTSD and has been shown in some refugee studies to be a predictor of PTSD with psychotic features.

Conclusions

Even with all the limitations described, this study contributes to shed light on a phenomenon that is as common as it is still little studied, that is, the presence of psychotic-like symptoms, and in particular VH, in a rapidly growing population worldwide such as refugee survivors of severe interpersonal traumatic events. Moreover, this study suggests the construct validity of severe PTSD with VH related to specific interpersonal traumatic events such as torture. This is an important area of research, not only because of the theoretical implications, but also and above all to provide health care professionals with adequate knowledge on the diagnosis, psychoeducation and treatment of particularly

complex patterns of post-traumatic disorders that are increasingly present in daily clinical practice in both developing and high-income countries.

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