

Quantifying medical evaluations of torture survivors: An analysis of 63 narrative reports from Denmark

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Key points of interest

- This research found that the 63 participating alleged survivors of torture were on average subjected to more than ten different torture methods and suffered a substantial burden of physical and psychological symptoms several years after exposure.
- Narrative reports of medical evaluations of alleged victims of torture conducted according to the Istanbul Protocol contain important data for research, and this study shows it is feasible to code these reports into quantitative data for descriptive analyses of torture methods and health findings.
- However, methodological challenges remain, including in relation to categorisation of torture methods, definition of a torture episode, non-standardised reporting, and absent negative findings. Adoption of standardised documentation frameworks and complementary quantitative health measures may strengthen future research in this area.

Abstract

Introduction: Denmark receives asylum seekers who allege to have experienced torture in different geographical and political contexts. The Istanbul Protocol provides internationally recognised guidelines for medico-legal documentation of such incidents. Doctors from Amnesty International's Medical Group regularly conduct medical evaluations of asylum seekers, which were analysed to assess the prevalence and patterns of alleged torture methods and their health consequences. *Methods:* Data from medical evaluations were coded, entered into a database, and subsequently exported to R version 4.4.3 using RStudio for analysis. Torture methods were grouped into physical, sexual, psychological, and deprivation categories. Symptoms were summarised for two periods, i.e., within one month after the alleged torture, and at the time of the medical evaluation. *Results:* 63 evaluations were conducted during 2013-2025 among persons aged 12-70 years who were born in 18 different countries. Collectively, 103 torture episodes were reported, with a mean number of distinct torture methods of 10.7 per person. Exposure to physical torture methods was reported by 96.8%, psychological torture by 87.3%, deprivation by 81.0%, and sexual torture by 39.7%. Most episodes occurred in police stations (33.0%) and prisons (17.5%). Many reported physical symptoms at the time of evaluation, and among individuals with available HTQ scores, 93.1% scored above the established

cut-off of 2.5, suggestive of PTSD. *Discussion:* This study illustrates the additional epidemiological value of transforming narrative reports into systematically structured data that allows for analyses of torture exposure and health outcomes. Wider adoption of standardised documentation analytical frameworks and complementary quantitative health measures may contribute to a more comprehensive understanding of the health consequences of torture and other ill-treatment.

Keywords: torture and ill-treatment, documentation of torture, health, Istanbul Protocol

Introduction

Torture and other ill-treatment remain widespread human rights violations, affecting individuals worldwide.¹ Survivors of torture make up a significant proportion of asylum seekers. In Denmark, studies have found that 13-45% of refugees have been exposed to torture prior to arrival (Amnesty International Denmark, 2024; Andersen et al., 2020; Hvidegaard et al., 2023; Masmus et al., 2008; Ostergaard et al., 2020). Research consistently shows that torture survivors often experience profound and long-lasting psychological, somatic and social consequences (Amris et al., 2019; Campbell, 2007; Carinci et al., 2010; De C Williams & Van Der Merwe, 2013; Diaz & Wallin Lundell, 2025; Goldfeld et al., 1988; Lunde & Ortmann, 1990; Williams et al., 2010).

Medico-legal documentation of torture plays a central role in the rehabilitation of survivors, the substantiation of asylum claims, and the pursuit of accountability for torture survivors, and the Istanbul Protocol (Manual on the Effective Investigation and Documentation of Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (IP)) provides internationally recognised guidelines for such documentation (OHCHR, 2022). The main aim of clinical evaluations as per the Istanbul Protocol is to provide an interpretation of the degree to which medical findings support the alleged exposure to torture and/or ill-treatment.

In Denmark, forensic medical evaluations in asylum cases are commissioned by the authorities when deemed relevant to the asylum assessment. However, the number of such evaluations is low. According to unpublished data obtained from the three departments of forensic medicine in the country, a total of 35 medical evaluations were conducted by these departments during 2013-2025. Most evaluations took place at the beginning of the period, and none during 2022-2024.

When no authority-commissioned evaluation is requested, asylum seekers and their legal representatives may seek an inde-

pendent assessment in accordance with the IP from Amnesty International's Medical Group. While the primary purpose of medico-legal documentation under the IP is to support survivors in legal and clinical processes, these detailed reports represent a valuable resource for epidemiological research. Relatively few studies have systematically transformed complete narrative medical documentation into a structured dataset using a predefined coding framework. Converting such documentation into quantitative datasets may therefore provide complementary insight into patterns of torture exposure and health outcomes.

The present study is a retrospective descriptive feasibility study that provides a quantitative analysis of the medical evaluations conducted by Amnesty International's Medical Group in Denmark between 2013 and 2025. The main aims were to assess the feasibility of transforming Istanbul Protocol narrative clinical documentation into structured data suitable for epidemiological analysis and to present the descriptive findings related to alleged torture exposure and health. A secondary exploratory aim was to determine whether it was possible to identify associations between exposure and health consequences. The strengths, limitations and practical challenges are discussed.

Methods

Data Management

Data were derived from digitalised medical documentation reports written during 2013-2025 by medical doctors who are part of Amnesty International's Medical Group. Evaluations typically comprise an interview and a medical examination, documenting alleged torture experiences and health findings. Results were noted in a narrative report and stored in digital form. The reports distinguished between current symptoms, defined as symptoms experienced within the month preceding the medical evaluation, and symptoms in the first month after torture, which were reported retrospectively during the medical evaluation. Symptoms suggestive of PTSD were assessed using Part IV of the original 16-item Harvard Trauma Questionnaire (HTQ).

¹ In this article, the term "torture" is used as an umbrella term for torture and other ill-treatment and refers to the definition in the UN Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (UN, 1984)

The HTQ was administered using the Danish-language form and was self-administered, with assistance from a professional interpreter when required; the interviewer could clarify or reformulate items if needed. Narrative reports generally included the total HTQ score and clinical interpretation rather than the completed item-level assessment.

Amnesty International Denmark removed direct personal identifiers from the reports, including names and refugee numbers, and hereafter transferred the anonymised records to DIGNITY. The records were transferred and stored safely, and were accessible only to DIGNITY staff directly involved in the data analysis. Unique study identifiers were assigned to the records, which were hereafter entered into a database developed by DIGNITY for medical documentation reports in line with the Istanbul Protocol. The database was built in KOBO Toolbox, hosted on a secure EU server,² and developed by DIGNITY's health staff prior to the present study. The database includes more than 900 variables and sub-variables covering demographic characteristics, torture exposure, physical and psychological findings, and consistency assessment. Variable categories were inspired by previous research on torture categorisation methods (Milewski et al., 2023) and organised according to the domains of the Istanbul Protocol. The structure enables systematic coding of data from narrative medical evaluations of victims of torture and was applied for research purposes for the first time in the current research.

Only the data processors had access to the database in KOBO Toolbox, which was secured by a two-step authentication process. To further ensure data confidentiality and security, dates of birth were modified when entering data into the database, using a predefined key. Also, the country in which the medical evaluation had taken place - i.e., Denmark for all individuals - was modified to a random country.

The second data processor subsequently reviewed initial data entry by the first data processor to identify and correct errors. Discrepancies and corrections were documented in a shared Excel spreadsheet and resolved by consensus, thereby ensuring intercoder reliability. During data entry, a logbook was maintained to document case-specific issues and information that could not be coded into the database.

Using the database's predefined coding framework based on the Istanbul Protocol, narrative medical reports were systematically coded to enable quantitative analysis. Free-text descriptions were reviewed and coded into structured variables which were developed prior to analysis. Variables were coded as binary or categorical based on explicit information document-

ed in the reports. When multiple torture methods or settings were explicitly described, each was coded as being present. Explicit, non-specific descriptions were coded as "other/unspecified", and variables not explicitly mentioned were coded as "missing". This approach ensured that the resulting dataset reflected documented allegations as reported.

Torture episodes were coded according to the sequence and number of episodes described in the reports. An episode was defined as either a single violent incident of torture or ill-treatment not involving deprivation of liberty, or as a continuous period of deprivation of liberty during which torture or other ill-treatment was reported. Within such a period, exposure to torture or other ill-treatment may have occurred across multiple locations and perpetrators.

Episode duration was coded as the reported period of exposure to torture or other ill-treatment. Thus, if the deprivation of liberty lasted longer than the reported exposure, only the exposure period was coded as the episode duration. If torture or other ill-treatment was documented throughout the period of deprivation of liberty, the full duration was coded, even when the nature of the torture or other ill-treatment varied over time. Cessation dates and exact durations were often documented imprecisely in the narrative reports. Episode duration was therefore coded using broad categories (hours, days, weeks, months, years). At the same time, the interval to medical evaluation was calculated from the reported onset date, which was more consistently extractable. This measure reflects time since onset rather than time since cessation of the most recent torture episode and may overestimate time since last exposure for prolonged episodes.

Body regions affected by beatings, whipping and kicking were coded using predefined variables and recorded as 'present' only when explicitly described, allowing multiple regions to be coded per episode. For example, non-specific reports of being beaten were coded as "beatings" and as "missing" for anatomical region. For analysis, the upper limbs, torso, gluteal area, and lower limbs were grouped as the body, and results were presented for three regions: body excluding the head and genitals, head/face, and genitals. Falanga and teléfono were coded as separate variables when explicitly reported or clearly described in the reports as constituting falanga or teléfono.

Statistical Analysis

Statistical analyses were conducted using R version 4.4.3 (R Core Team, 2025) in RStudio version 2026.6.0.242 (RStudio Team, 2026). Descriptive statistics were used to summarise demographic characteristics, torture exposure, and health findings. Continuous variables were reported as mean $\pm$ standard devia-

2 <https://eu.kobotoolbox.org/>

tion (SD) or median with interquartile range (IQR) as appropriate, and categorical variables as numbers and percentages.

Torture exposure was analysed at both the person and episode level. In person-level analyses, individuals were counted once per torture method or category, regardless of the number of reported episodes. Person-level analyses were used to examine cumulative exposure and associations with health outcomes, whereas episode-level analyses were used to describe characteristics and contextual patterns of torture episodes.

Torture methods were grouped into physical, sexual, psychological, and deprivation categories (Milewski et al., 2023). Physical and psychological symptoms were summarised for two periods: 1) symptoms in the first month after torture, reported retrospectively during the medical evaluation, and 2) current symptoms, defined as symptoms experienced within the month preceding the evaluation. HTQ total mean scores were categorised using the commonly applied cut-off value of 2.5, with scores ≥ 2.5 considered suggestive of clinically significant PTSD symptoms (Mollica et al., 1992).

As secondary exploratory analyses, selected associations involving torture exposure were examined. Associations between torture methods and country of alleged torture episode were examined descriptively using cross-tabulations due to sparse country-level data. Episode-level mixed-effects logistic regression was used to assess the association between sexual torture and gender, accounting for repeated episodes within individuals. Differences in HTQ total mean scores were assessed using t-tests or analysis of variance (ANOVA), as appropriate, for exposure to sexual torture, duration of the longest torture episode, number of torture episodes, and number of distinct torture methods (<5, 5-9, 10-14, 15-19, ≥ 20), all selected a priori. Associations between torture methods and current symptoms were explored using unadjusted logistic regression models, comparing exposed and unexposed individuals. The torture methods and symptoms analysed were selected based on clinical and existing hypotheses regarding plausible exposure-outcome relationships. For these exploratory analyses, undocumented exposures or symptoms were generally interpreted as absent, except for sexual dysfunction, which was treated as missing unless explicitly reported because of its assumed sensitivity to underreporting. Analyses were conducted among individuals or episodes for which data were available on both the exposure and outcome of interest; therefore, denominators varied across analyses. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated, and statistical significance was assessed using a two-sided significance level of 0.05.

Ethical Considerations

This project involved secondary analysis of de-identified data and was conducted in accordance with the General Data Protection Regulation (GDPR). DIGNITY and Amnesty International Denmark jointly agreed on all procedures for data transfer, access, storage, and processing in advance to ensure compliance with applicable data protection requirements. During the data handling process, there were no breaches in data security.

Amnesty International Denmark granted permission for secondary use of the reports for research purposes. Data were anonymised, results are not person-attributable, and data were handled with strict data protection and confidentiality safeguards. Under the Danish Committee Act on Research Ethics Review of Health Research Projects, studies based on secondary analysis of existing de-identified data, without new participant contact, intervention or use of human biological material, are not subject to review by a regional research ethics committee. The project was therefore handled in accordance with the applicable data-protection and data-controller framework.

Results

Study Population

A total of 63 individuals - 56 males and 7 females - were examined during 2013-2025. The individuals' ages at the time of the medical evaluation ranged from 12 to 70 years, with a mean age of 37.9 (Table 1). Persons were born in 18 different countries, the most frequent being Afghanistan (12.7%), Iran (11.1%), Russia (9.5%), Iraq (9.5%) and Sudan (9.5%) (Figure 1). Notably, there was a substantial proportion of missing information about religious affiliation, civil status, and educational level. Information on the date of arrival in Denmark was missing in the reports of 24 individuals (38.1%). Among those with available data, the median time between arrival in Denmark and the medical evaluation was 3.2 years (IQR 1.7-5.9) (Table 1).

Alleged Torture Exposure and Characteristics of Alleged Torture

All individuals had an alleged history of torture or other ill-treatment, consistent with the inclusion criteria. Collectively, a total of 103 torture episodes were reported. While the majority reported one torture episode, over 40% of individuals reported more than one episode (Table 2). The median time between the onset of the latest torture episode and the medical evaluation by Amnesty International's Medical Group was 5 years, ranging from 1 to 23 years (Table 2).

Most torture episodes were reported to have occurred in Iran (23.3%), followed by Russia and Sudan (Figure 2). The years during which the torture episodes had taken place varied

Table 1. Demographic characteristics

n=63	
Gender	
Female	7 (11%)
Male	56 (89%)
Other	0 (%)
Missing	0 (0%)
Mean Age, years*	Mean $\pm$ SD (Min-Max) 37.9 $\pm$ 11.6 (12-70)
Age Group*	
<18	1 (1.6%)
18-29	17 (27.0%)
30-44	27 (42.9%)
45-59	14 (22.2%)
60+	3 (4.8%)
Missing	1 (1.6%)
Region of Origin	
Asia	13 (20.6%)
Middle East/North Africa	21 (33.3%)
Sub-Saharan Africa	19 (30.2%)
Europe	8 (12.7%)
Missing	2 (3.2%)
Religion	
Christian	2 (3.2%)
Muslim	20 (31.7%)
Other	3 (4.8%)
No religion	1 (1.6%)
Missing	37 (58.7%)
Civil status	
Married	34 (54.0%)
Divorced	3 (4.8%)
Domestic partnership	1 (1.6%)
Single	7 (11.1%)
Missing	18 (28.6%)

Educational level

Master's level or higher	3 (4.8%)
Bachelor	5 (7.9%)
Short tertiary	7 (11.1%)
Secondary	18 (28.6%)
Primary	9 (14.3%)
No education	8 (12.7%)
Missing	13 (20.6%)

Time between arrival in Denmark and medical evaluation, years (n=39)	Median (IQR) 3.2 (1.7-5.9)
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*Age at time of medical evaluation

Table 2. Alleged torture exposure

n=63	
Number of torture episodes	
One	35 (55.6%)
Two	20 (31.7%)
$\geq$ Three	8 (12.7%)
Torture methods	
Physical	61 (96.8%)
Psychological	55 (87.3%)
Sexual	25 (39.7%)
Deprivation	51 (81.0%)
Number of distinct torture methods	Mean $\pm$ SD 10.7 $\pm$ 5.9
Number of distinct torture methods	
<5	5 (7.9%)
5-9	26 (41.3%)
10-14	20 (31.7%)
15-19	6 (9.5%)
$\geq$ 20	6 (9.5%)
Time between onset of latest torture episode and medical evaluation, years (N=54)*	Median (IQR) 5 (3-9)

Table 2. *Alleged torture exposure (continued)*

n=103	
Duration of alleged episode	
Hours	25 (24.3%)
Days	20 (19.4%)
Weeks	21 (20.4%)
Months	25 (24.3%)
Years	7 (6.8%)
Missing	5 (4.9%)
Place of torture**	
Police station	34 (33.0%)
Prison	18 (17.5%)
At home	10 (9.7%)
In public	8 (7.8%)
Intelligence service	7 (6.8%)
Military camp	4 (3.9%)
Other/Unspecified	13 (12.6%)
Missing	15 (14.6%)
*Excluding individuals with missing year of onset for most recent episode.	
**One torture episode may include more than one place of torture, as an episode may refer to a continuous period during which torture or ill-treatment occurred across multiple locations.	

from 1990 to 2022, with missing data on the year of exposure for 14 episodes. Alleged exposure to torture methods was diverse, with physical violence constituting the most frequently documented category, reported by 96.8% of individuals. The most common forms of physical violence were beatings, kicking and tying of body parts, including handcuffing (Figure 3). Among episodes involving beatings, beatings with instruments were more frequently described than beatings with the hands. Out of the 103 torture episodes reported, 61.2% included any form of blunt trauma to the body excluding head and genitals (40.8% included beatings with instruments, 25.2% included beatings with the hands, 34.0% included kicking), 45.6% included blunt trauma to the head/face (31.1% included beatings with instruments, 30.1% included beatings with the hands,

14.6% included kicking), and 6.8% of episodes included blunt trauma to the genitals (5.8% included beatings with instruments, 1.9% included beatings with the hands, 1.9% included kicking). Falanga and teléfono were coded separately as specific beatings and are not included in the above-mentioned prevalences. Falanga and teléfono were reported in 13.6% and 4.9% of episodes, respectively. Psychological torture was reported by 87.3% of individuals, deprivation of any kind by 81.0%, and sexual torture by 39.7%. The mean number of distinct torture methods reported per person was 10.7 ± 5.9 (Table 2). At the episode level, a median number of 7 (IQR: 3-9) distinct torture methods were reported.

The duration of reported torture episodes varied, with episodes lasting hours and episodes lasting months most frequently reported (24.3% each), followed by episodes lasting weeks (20.4%) and episodes lasting days (19.4%). The most frequently reported places of torture were police stations (33.0%) and prisons (17.5%) (Table 2).

Health Findings

Prior to alleged torture exposure, pre-existing chronic physical disease was documented in four reports (6.3%) and pre-existing mental health issues were documented in one report (1.6%), where the person was suffering from anxiety and PTSD prior to torture exposure.

Symptoms in the first month after torture were retrospectively reported at the medical evaluation and were documented less frequently than symptoms experienced during the month preceding the evaluation, particularly for psychological symptoms. Musculoskeletal symptoms were the most frequently reported physical symptoms both within the first month after torture and at the time of the medical evaluation, followed by central nervous system symptoms (Figure 4). Among specific symptoms reported to have been present within the first month after torture, headache and musculoskeletal pain were the most frequent physical symptoms. Psychological symptoms within the first month after torture were reported by almost half of the individuals (Figure 4), most commonly general anxiety, as reported by 41.3% of individuals, followed by sleeping problems (14.3%).

At the time of the examination, most individuals reported pain in at least one body region, affecting 100% of women and 89.3% of men, most commonly headaches and musculoskeletal pain (Figure 5). Psychological symptoms were reported by 98.4% of individuals at the time of examination, with sleeping problems, flashbacks, and difficulties concentrating being the most frequently reported symptoms (Figure 5). The mean HTQ score was 3.03 ± 0.41 , with 93.1% of 58 individuals for

Figure 1. Country of birth (n=63)

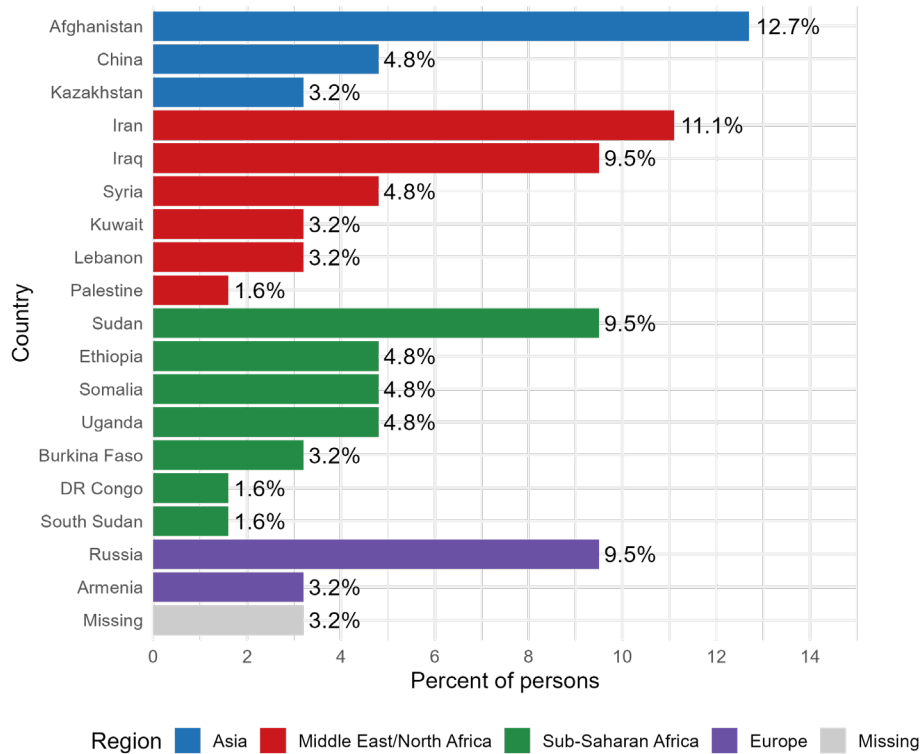


Figure 2. Country of alleged torture episode (n=103)

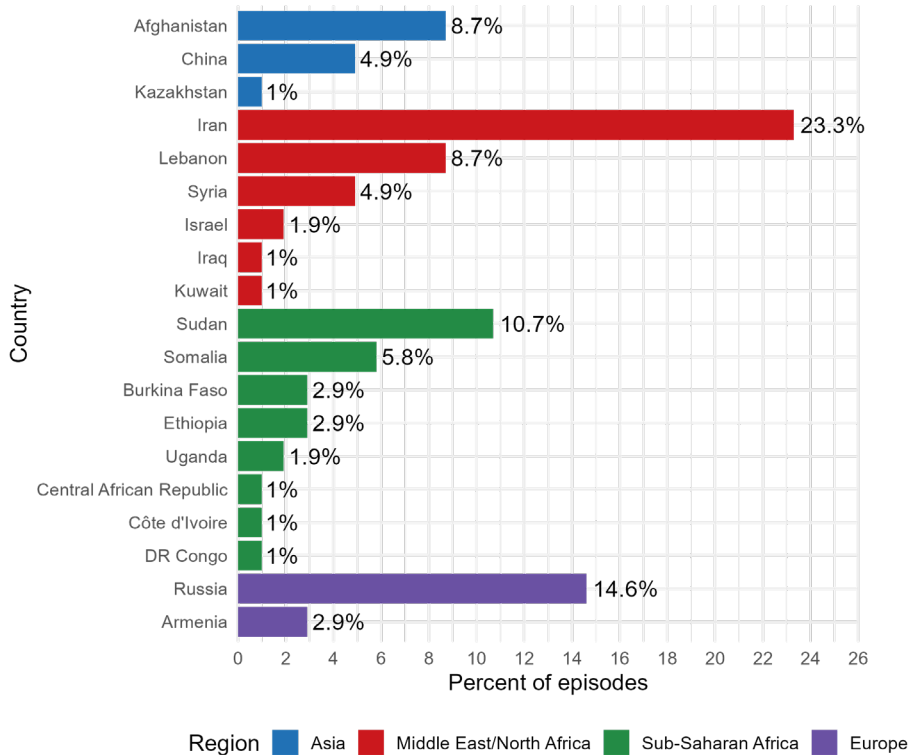


Figure 3. Alleged exposure to distinct torture methods, person-level (n=63)

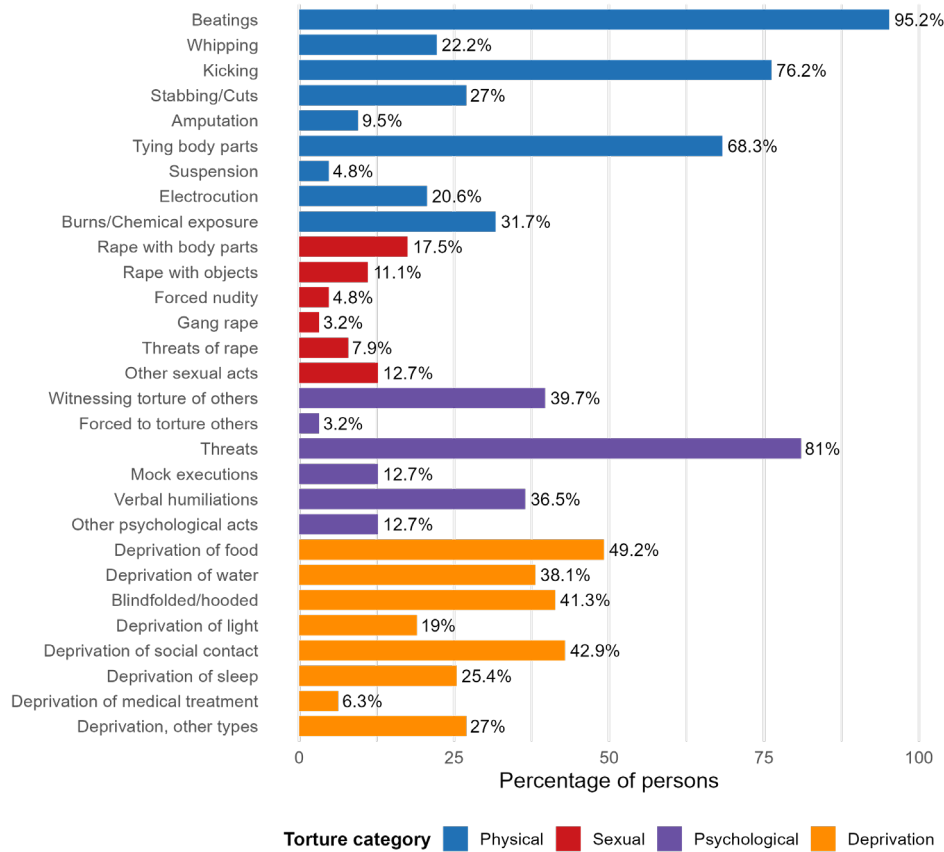
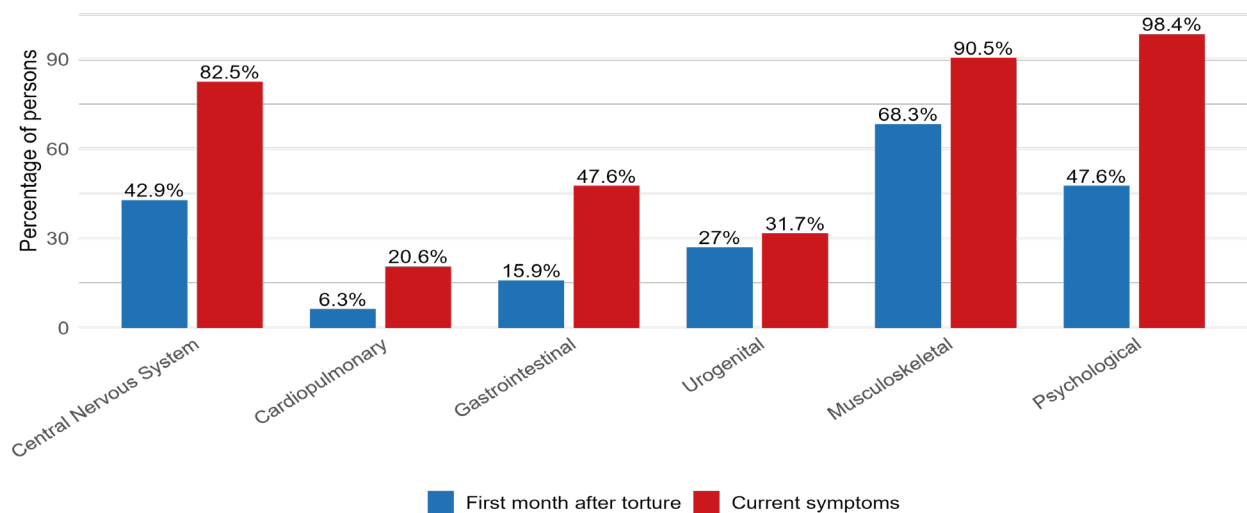
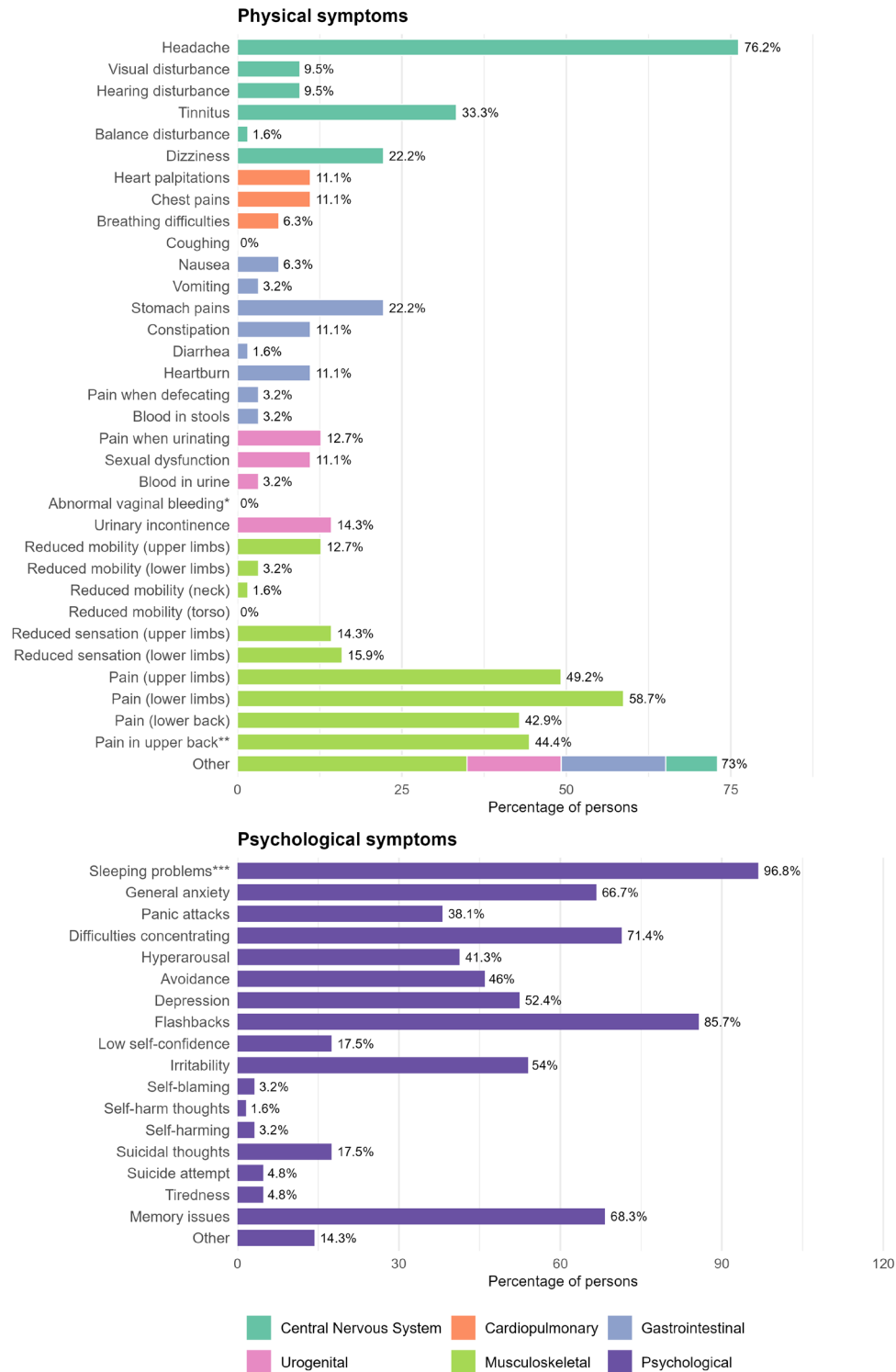


Figure 4. Reported Symptoms (n=63).



Symptoms within the first month after torture were retrospectively reported at the medical evaluation; current symptoms refer to the month preceding the evaluation.

Figure 5. Physical and psychological symptoms at the time of examination (n=63) (Rathke et al., 2020; Norredam et al., 2005; Thomas et al., 2023; Petreca et al., 2024)



* Bleeding not caused by menstrual cycle.

** Including shoulders and neck.

*** Including nightmares.

whom scoring was done having scores above the established cut-off of 2.5, suggestive of PTSD.

Medication use at the time of the medical evaluation was common and reported by 40 of the 63 individuals (63.5%). The most frequently reported medications were sedatives, including sleeping medication and tranquilizers, and analgesics, used by 33.3% and 30.2% of individuals respectively. Medication for chronic somatic illness was reported by 25.4%. Among psychotropic medications used at the time of examination, antidepressants were reported by 12.7%, antipsychotics by 9.5%, and mood stabilizers by 1.6% of individuals.

Association between Selected Torture Methods and Demographic Characteristics

Torture episodes reported by women more frequently included sexual torture (including rape, threats of rape, forced nudity and other sexual acts) compared with episodes reported by men, although the estimate was imprecise (OR 11.0, 95% CI 1.30-92.80; $p=0.017$).

Specific torture methods were broadly distributed across countries of alleged exposure, and no distinct country-specific patterns were identified in exploratory analysis.

Association between Health Symptoms and Torture Exposure

Exploratory analyses among individuals with available HTQ scores did not demonstrate statistically significant differences in HTQ total scores by the duration of the longest reported torture exposure ($p=0.739$), number of torture episodes ($p=0.939$), number of distinct torture methods ($p=0.228$) or exposure to sexual torture ($p=0.556$).

Associations between selected torture methods and health symptoms at the time of the medical evaluation were examined, comparing exposed and unexposed individuals. Statistically significant associations were observed between teléfono and hearing loss and falanga and reduced sensation in lower limbs, but data was limited, the lowest confidence intervals for the odds ratios only slightly above 1, and the confidence intervals large.

Discussion

This study examined a heterogeneous group of torture survivors evaluated by Amnesty International's Medical Group over a thirteen-year period. It demonstrated the possibility of coding narrative reports into quantitative data and found a high burden of persistent physical and psychological symptoms several years after torture exposure. This group of torture survivors had not undergone forensic medical documentation by the authorities but instead had been referred by their lawyer to an independent

medical evaluation by Amnesty International's Medical Group, often with the aim of supporting their asylum claim.

The study population was diverse in terms of country of origin, country of alleged torture, torture setting, duration of torture episode, and number of torture episodes, yet was unified by extensive co-exposure to multiple torture methods, with a mean of 10.7 distinct methods per person. Interpretation of torture method-specific health outcomes is therefore challenging, particularly in light of the substantial time interval between the torture exposure and the medical evaluation and the potential for recall-related misclassification of both exposure and symptoms.

Fewer symptoms were reported for the first month after torture than at the time of the medical evaluation. This finding may reflect recall bias associated with the long interval between exposure and medical evaluation, together with information bias arising from non-systematic or lacking health symptoms assessment, particularly for psychological symptoms which are often underreported unless explicitly assessed (Bushnell et al., 2005; Peters et al., 2009; Robinson & Roter, 1999). Persistent symptoms were common at the time of the medical evaluation, with pain reported by 90.5% of individuals, indicating a substantial burden of ongoing physical morbidity consistent with previous findings in populations of torture survivors (Modvig & Quiroga, 2020; Olsen, Montgomery, Bøjholm, et al., 2006; Olsen, Montgomery, Carlsson, et al., 2006; Thomsen et al., 2000). The high prevalence of persisting psychological symptoms is consistent with previous literature on persistent trauma-related sequelae among torture survivors (Dibaj et al., 2020; Modvig & Quiroga, 2020; Steel et al., 2009; Turner & Horst-Unsworth, 1990) and is reflected in the high proportion of individuals with HTQ scores ≥ 2.5 , suggestive of PTSD. Psychiatric morbidity, including PTSD, depression, anxiety and psychosis, is common among torture survivors (Rathke et al., 2020; Steel et al., 2009). However, this study did not establish formal psychiatric diagnoses but instead relied on self-reported symptoms and HTQ scores, which may be present without meeting diagnostic criteria.

Psychological symptom severity, measured using the HTQ score, was not found to be associated with duration of torture episode(s), number of torture episodes, or number of distinct torture methods. However, given the limited sample size, high degree of co-exposure, and coarse exposure measures, the absence of statistically significant findings does not indicate that these exposure dimensions are unrelated to psychological outcomes. Qualitative aspects of torture including loss of control, perceived threat to life, humiliation, and unpredictability, have been emphasized in previous trauma research as important

for psychological outcomes (Aprigio & Gauer, 2024; Başoğlu, 1998; Ozer et al., 2003), but these dimensions could not be assessed directly in the present study. Psychological outcomes may also be influenced by post-migration stressors, including ongoing insecurity related to asylum status, as well as individual vulnerability factors such as prior mental health status, coping resources, and personality characteristics. Previous studies have suggested that rape is associated with a higher risk of PTSD than other types of trauma (Breslau, 1991; Dalgaard et al., 2021; Hooberman et al., 2007). The results of this study do not support these findings, but this may reflect the small sample size rather than absence of a relationship.

In exploratory analysis, two statistically significant associations were found between a specific torture method and a health symptom at the time of the medical evaluation, i.e., between *teléfono* and hearing loss and between *falanga* and reduced sensation in lower limbs. The data on this was, however, very limited and the confidence intervals large. Therefore, the findings should be read with caution. Nonetheless, the findings are presented because they are consistent with what is well known clinically and illustrate how data can be meaningfully extracted and analyzed to generate hypotheses on the interlinkage between specific trauma and health consequences. On the other hand, the fact that only two associations were found may reflect the extensive co-exposure to multiple torture methods and to other types of trauma, and the largely non-specific nature of health symptoms. The health consequences of exposure to sexual torture were examined using HTQ scores as a measure of psychological symptom severity and sexual dysfunction as a multifactorial outcome with both psychological and physical components. In the present study, no statistically significant association was observed between exposure to sexual torture and either HTQ scores or sexual dysfunction. Given the limited sample size and the substantial co-exposure to multiple torture methods, the absence of statistically significant findings should be interpreted cautiously and does not preclude clinically meaningful associations.

Previous studies have documented both impaired sexual functioning and psychological sequelae among survivors exposed to sexual torture (Ba & Bhopal, 2017; Domovitch et al., 1984; Lunde et al., 1981; Lunde & Ortmann, 1990; Norredam et al., 2005). Others have also documented broader interpersonal and social consequences of sexual violence and torture, including trust difficulties and impaired capacity for intimate relationships (28, 38–40). Such social and relational impairments constitute an important dimension of health as defined by the World Health Organization (World Health Organization, 1946) but were not included in the present dataset as

information about this dimension was not systematically documented in the reports analyzed.

Torture episodes reported by women more frequently included sexual torture than those reported by men. Although the difference was statistically significant, the number of episodes reported by women was limited, resulting in a wide confidence interval around the estimated odds ratio. The magnitude of the effect should therefore be interpreted with caution. The finding is nevertheless consistent with previous studies (Hooberman et al., 2007; Lunde & Ortmann, 1990; Milewski et al., 2023; Mundy et al., 2020), but may also reflect differential reporting, as stigma, shame and cultural factors may contribute to underreporting (Roberts et al., 2010; Thomas & Kopel, 2023).

Descriptive analysis of torture methods by country did not reveal any country-specific patterns, which is expected given the limited sample size. Even large-scale studies have not found country-specific patterns (Milewski et al., 2023). However, the detailed structure of the database, including information on the timing of torture episodes, provides a framework that could facilitate analysis of temporal trends within and across country contexts in larger datasets.

This study illustrates the potential of detailed medical documentation and highlights the utility of standardized, quantifiable measures, such as the HTQ score, for capturing symptom severity. It also illustrates the need for complementary instruments assessing other dimensions of health impact including pain, depression, anxiety, and quality of life. The findings moreover suggest that severe torture exposure and persistent health sequelae may not always be identified or acknowledged as needing further examination and treatment through formal referral pathways within the asylum process. Although the effect of the medical evaluation on the individuals' asylum outcome could not be measured in this study, studies in other countries suggest the importance of medical documentation in asylum processes, both by state authorities and other organizations (Clément et al., 2017; Franceschetti et al., 2019; Mandel & Worm, 2007).

A methodological contribution of this study is the development and application of a structured coding framework and database for systematically coding narrative medical evaluations in line with the Istanbul Protocol, into quantitative data. Previous studies have shown the value of forensic medical data in describing torture exposure, geographical patterns, and physical and psychological sequelae amongst torture survivors (Busch et al., 2015; Hougen, 1988; Milewski et al., 2023; Modvig & Quiroga, 2020; Perez Sales, 2020). The present study builds on this approach by showing that medical reports can

be structured for epidemiological analysis, thereby supporting research on torture exposure and health outcomes.

Limitations

Medical documentation of torture often comes with challenges. Physical injuries may be nonspecific, healed, or disguised by time, while psychological consequences can be complex and influenced by ongoing stressors such as displacement or insecure legal status.

In this study, the limited sample size and heterogeneity of the data constitute important limitations for comparative statistical analyses. These challenges are compounded by the nature of torture exposure itself. Torture survivors are rarely subjected to a single form of torture or other ill-treatment; rather, exposure typically involves multiple methods which may have occurred over extended periods of time. In the coding, multiple acts, methods, locations, or perpetrators were considered part of the same torture episode, when they occurred within one continuous period of deprivation of liberty. This approach underestimates the number and complexity of discrete torture exposure. In the present sample, individuals were on average exposed to over ten distinct torture methods over varying periods of time, ranging from hours to years. Given this high degree of co-exposure, together with the largely non-specific nature of many health symptoms, attributing specific health outcomes to individual torture methods was shown to be challenging. In addition, health outcomes may be influenced by additional unmeasured confounders, including exposure to armed conflict and stressors related to displacement and migration. These limitations are not unique to the present study but are characteristic of epidemiological research examining the health consequences of specific torture methods and underscore the need for substantially larger datasets to improve statistical power and reduce the risk of both type I (false positive) and type II (false negative) errors.

Torture survivors constitute a highly heterogeneous population exposed to complex and overlapping combinations of torture methods, with experiences that are inherently individualized. While coding narrative accounts into binary or categorical variables enables quantitative analysis and serves an important epidemiological purpose, this process inevitably entails loss of contextual detail and may not fully capture the complexity, severity, or subjective meaning of individual experiences. Non-specific descriptions, such as beatings reported as occurring “all over the body,” required conservative coding decisions, leading to reduced anatomical specificity.

Furthermore, the structure and level of detail of reports varied across examining clinicians, introducing additional

variability in data quality and completeness. In some reports, specific torture methods were explicitly identified, whereas in others, exposures were described narratively without explicit categorization, requiring interpretation by the coders. This was particularly relevant for deprivation-based and psychological methods, where classification relied more heavily on interpretation, increasing the potential for misclassification. While the Istanbul Protocol outlines five degrees of consistency to assess how well the physical and psychological findings correspond with an alleged method of torture or other ill-treatment (OHCHR, 2022),³ this was not consistently applied across reports. Similar challenges have been reported in a recent publication, showing discrepancies in the assignment of Istanbul Protocol consistency levels (Argo et al., 2026). In this study, most reports indicated a general assessment ‘consistent with’ which makes it difficult to assess the relationship.

Nearly all assessments relied on interpreter-mediated interviews. Although communication was generally described as adequate, some reports documented difficulties, and the inherent limitations of interpretation may have contributed to measurement error.

An inherent limitation of epidemiological research on the health consequences of specific torture methods is the challenge in quantifying exposure intensity. Health consequences are likely to depend not only on exposure to a specific torture method but also on the duration and intensity of that exposure. In this study, no direct measures of the intensity of individual torture methods were available, and overall episode duration cannot serve as a valid proxy, as intensity may vary substantially within a given episode. In addition, perceptions and reporting of intensity are subjective and may moreover be influenced by pre-existing physical or psychological health conditions, which are challenging to assess retrospectively when relying on self-reported information.

Another important limitation of the study concerns the nature of the data source. The medical reports were produced for clinical and documentation purposes rather than research, and negative findings were not systematically recorded. Consequently, absence of documentation could not be assumed to reflect absence of exposure or symptoms, resulting in missing data and potential misclassification. For the analysis of association between torture methods and symptoms, missing information about exposure to a specific torture method and undocumented symptoms were handled as absent. While this approach allowed for inclusion of a larger number of observa-

3 i.e., ‘not consistent with’, ‘consistent with’, ‘highly consistent with’, ‘typical of’, and ‘diagnostic of’.

tions in the analysis, it may have led to misclassification, potentially influencing observed associations between torture methods and health outcomes. Only the health outcome 'sexual dysfunction' was handled differently, as it seemed not to be routinely assessed and is known to be particularly sensitive to underreporting. When not explicitly reported, sexual dysfunction was therefore coded as missing.

In this study, the median time between the onset of the most recent torture episode and the medical evaluation was 5 years, 93.1% of individuals with available scores had an HTQ score above 2.5, and 68.3% of individuals reported memory issues at the time of the medical evaluation. This introduces a risk of recall bias, with potential underreporting or misclassification of both torture exposure and symptoms that were present in the first month after torture. Such misclassification may be further exacerbated by cultural stigma and shame, particularly in relation to sexual torture and symptoms of sexual dysfunction.

The study population consists of individuals presenting for medical evaluation by Amnesty International's Medical Group, which limits generalizability to all torture survivors because of risk of selection bias. Individuals seeking such evaluations may be more likely to have experienced more severe and/or more persistent symptoms or may have more complicated histories or asylum procedures. This clinical selection, however, also enables a level of detailed exposure characterization and medical assessment that is rarely achievable in larger population-based studies.

Finally, the study design does not allow for causal inference and limits the generalizability of the findings. The primary aim of this study was not to establish causality or to produce broadly generalizable estimates, but rather to generate hypotheses and illustrate the epidemiological potential of systematically collected medical data. While the foremost purpose of medical documentation reports of torture remains to support survivors in their health care and legal processes, their structured use also offers an important opportunity to advance research on the health consequences of torture and other ill-treatment.

Conclusion

The findings describe a heterogeneous and clinically complex group of torture survivors with extensive and repeated exposure to multiple torture methods and a substantial burden of physical and psychological symptoms several years after exposure.

This retrospective feasibility study shows that heterogeneous narrative medical documentation reports can be converted, through intensive expert coding and adjudication, into structured data capable of describing documented torture exposures and health findings. This is of value in relation to descriptive

studies. However, it also demonstrates major limitations arising from non-standardized reporting, absent negative findings, uncertain episode definitions, extensive co-exposure and small samples. Prospective use of a standardized minimum dataset, complementary validated health measures and formal assessment of coding reliability would be required before such data could support robust analyses of method-specific health consequences. Should it be possible to overcome these challenges, Istanbul Protocol narratives contain a wealth of information that could improve knowledge about the interlinkage between torture exposure and health outcome and the ability to support survivors in their health care and legal processes.

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