

# SEXUAL ASSAULT REPORTING

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A study to improve prevention, information, and care for individuals presenting to emergency departments following sexual assault

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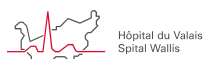


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# Introduction

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Sexual assault is a major public health and human rights concern with profound and long-lasting repercussions on survivors' physical, psychological, and social well-being. The World Health Organization estimates that nearly one in three women worldwide experiences physical and/or sexual violence in her lifetime, most frequently by an intimate partner, though non-partner sexual violence remains substantially underreported.<sup>[1]</sup> Individuals exposed to sexual violence often face barriers to disclosure and care related to stigma, fear of disbelief, and the emotional burden of recounting the assault, contributing to significant gaps in documentation and support. In Switzerland, as in many other countries, improving the medico-legal and health response to sexual violence has become a national priority, reinforced by the ratification of the Istanbul Convention in 2018 and the Swiss Federal Office for Gender Equality's (FOGE/BFEG) 2022–2026 National Action Plan.<sup>[2,3]</sup> These initiatives emphasize the need for reliable data collection and coordinated, trauma-informed healthcare pathways.<sup>[3,4]</sup>

Between 2018 and 2021, a retrospective study conducted at the Geneva University Hospitals (HUG) and Lausanne University Hospital (CHUV) provided the first systematic analysis of sexual assault cases reported in obstetrics and gynecology emergency departments in French-speaking Switzerland.<sup>[5]</sup> This study, based on standardized paper medico-legal reports, described 740 cases and documented the sociodemographic, clinical, and forensic characteristics of persons presenting for a sexual assault medico-legal examination and report.<sup>[5]</sup> It revealed that most survivors knew their assailant, that physical and genital injuries were observed in nearly one-third of cases, and that the majority of consultations occurred within 72 hours. However, as a cross-sectional analysis limited to acute care, the study could not assess the medium- and long-term health consequences of sexual assault, nor their experiences of care over time.

The current prospective, multicenter study (2022–2024) was informed by the retrospective study and designed to address these gaps. It extends data collection beyond HUG and CHUV to include additional

hospitals in the cantons of Vaud and Valais, thereby broadening the representativeness of the study population. Building on the same standardized medico-legal protocol, it also introduces an electronic sexual assault report form at HUG to ensure consistent documentation and data quality.<sup>[6]</sup> For the first time, follow-up assessments at three and twelve months allow for longitudinal evaluation of patients' psychological, sexual, and physical health outcomes, using validated psychometric tools.

This prospective phase thus marks a significant methodological and conceptual advance: it transitions from retrospective documentation of acute medico-legal care to an integrated, patient-centered, and longitudinal approach. By combining clinical, forensic, and self-reported data, it provides new insight into the enduring health burden associated with sexual assault, the experience of care received in emergency settings and offers an evidence base to inform prevention, care delivery, policy, education and the future development of a regional sexual assault registry in Switzerland.

The aim of this ongoing prospective study is to assess the characteristics, health outcomes, and healthcare experiences of cisgender women, transgender women, and queer persons aged  $\geq 16$  years, regardless of sexual orientation, presenting for a forensic sexual assault examination at participating emergency departments in Switzerland between November 2022 and December 2024.

This study represents the second phase of a broader research project entitled "Sexual Assault Reporting – A study to improve prevention, information and care after sexual assault in emergency care settings." Building on findings from the initial retrospective study (2018–2021), which analyzed reports at Geneva University Hospitals (HUG) and Lausanne University Hospital (CHUV), the present prospective, multicenter study extends data collection across multiple cantons (Geneva, Vaud, Valais) in order to provide more comprehensive epidemiological data, evaluate patients' physical, psychological, and sexual health over 12 months, and strengthen prevention and care pathways.

# Materials and methods

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## Inclusion and exclusion criteria

Prospective data were collected for all persons including cisgender women, non-binary, queer persons, transgender men with a vulva and vagina and transgender women, regardless of sexual orientation, aged  $\geq 16$  years, presenting to the participating emergency departments in French speaking Switzerland to report a sexual assault between November 1, 2022 and December 31, 2024. Eligible patients are required to have decisional capacity and to provide written informed consent. Adolescents aged 16–18 years may be included if accompanied by a legal representative who also provides signed consent, or if the doctor confirms that the adolescent has decisional capacity, in which case the adolescent's signature alone is sufficient. Children and adolescents  $< 16$  years, cisgender men, and patients with more than 3 sexual assaults reported at a participating center during the study period were excluded. For these recurrent patients, the first three assaults are included. This limit was applied because the 3- and 12-month follow-up questionnaires (GAD-7, PHQ-9, PCL-5, PHQ-15, FSFI, WHO-ASSIST) require participants to recall their symptoms and emotional state over the previous four weeks. For individuals with multiple recent assaults, repeated exposure within short intervals would make it difficult to accurately attribute their responses to a specific event. Restricting to the first three cases therefore ensures greater reliability and interpretability of follow-up data while still capturing repeated victimization patterns. Patients unable to communicate in one of the study languages or through a certified interpreter, as well as those without decisional capacity, were also excluded. A case-level analysis was conducted, meaning each sexual assault record was treated as a separate case, even if multiple cases involved the same patient. The term queer is used here only to refer to gender identity and not sexual orientation.

## Forensic and gynaecologic examination and data collection

The Romandy University Center of Legal Medicine (CURML), located at Lausanne University Hospital (CHUV) and Geneva University Hospitals (HUG), is a regional medico-legal center created in collaboration between the two university hospitals of French-speaking Switzerland. Since 2020, CURML forensic doctors also provide medico-legal services at regional hospitals in the canton of Vaud, in order to avoid long-distance transfers for patients. In the canton of Valais, medico-legal examinations are conducted by the local department of Forensic Medicine, which follows the same standardized protocol as CURML.

When a patient presents or is referred to the obstetrics and gynecology emergency departments of HUG, CHUV, or any of the participating hospitals (Hôpital Riviera-Chablais, EHC Morges, HIB Payerne, eHnv Yverdon-les-Bains, GHOL Nyon, Hôpital du Valais), they are triaged by a specialized nurse and examined by an on-call forensic doctor and gynecologist at the gyneco-obstetrical emergency department. The main goal is to attend to the patient's needs in the most coherent and coordinated manner by offering them medico-psychological and medico-legal follow-up in the short, medium and long term.

Patients presenting for sexual assault are triaged as a degree 2 emergency for blood and urine sampling, and as a degree 3 emergency for the clinical examination according to the triage protocol, due to the time-sensitive nature of forensic evidence collection—particularly blood and urine samples, which must be obtained rapidly before potential biological traces are lost. Patients are therefore attended within approximately 20 minutes by a nurse for urine and blood sampling, and within two hours by the forensic doctor and gynecologist, in accordance with the standardized medico-legal protocol. Treatment includes post-exposure prophylactic therapies, emergency contraception, and follow-up appointments that may differ slightly between sites. At HUG, patients  $\geq 16$  years old are offered an appointment at the Interdisciplinary Unit of Medicine and Prevention of Violence (UIMPV) with a psychologist the following day, a consultation at the HIV clinic five days later, and a gynecological outpatient visit approximately ten days after.

At CHUV, patients receive a single appointment at the psychosomatic and psychosocial clinic in the obstetrics and gynecology department within 30 days after the sexual assault. At other participating sites, follow-up is arranged according to local pathways but always in line with the same standardized medico-legal protocol. For patients <16 years old, follow-up is provided in pediatric services.

The medico-legal exam provides the necessary written and photographic documentation, in the event of criminal proceedings and with the patient's consent, for judicial authorities no matter the decision of the patient to press charges. Since 2022, the HUG has adopted a standardized electronic medico-legal file for sexual assault reports, ensuring comparability across all centers.<sup>16]</sup> Data for this study are obtained from finalized sexual assault reports written and signed by the forensic doctor and gynecologist who examined the patient.

### 3 and 12 month follow-up

#### **GAD-7 (Generalized Anxiety Disorder-7)**

The GAD-7 is a 7-item self-report questionnaire used for the screening of generalized anxiety disorder. It measures the frequency of symptoms experienced over the previous 14 days, using a scale ranging from 0 ("not at all") to 3 ("nearly every day"). The total score ranges from 0 to 21, with cut-offs interpreted as follows: 0–4 = minimal anxiety, 5–9 = mild anxiety, 10–14 = moderate anxiety, and 15–21 = severe anxiety. In this study, a score  $\geq 10$  was considered clinically significant, indicating the likelihood of an anxiety disorder warranting further clinical evaluation. This tool is simple to use and allows efficient monitoring of symptom evolution over time.

#### **PHQ-9 (Patient Health Questionnaire-9)**

The PHQ-9 is a 9-item self-report tool used to screen for and assess the severity of depression. It evaluates the frequency of symptoms experienced over the previous 14 days, using a scale from 0 ("not at all") to 3 ("nearly every day"). The total score ranges from 0 to 27, with thresholds interpreted as follows: 0–4 = minimal, 5–9 = mild, 10–14 = moderate, 15–19 = moderately severe, and 20–27 = severe. In this study, a score  $\geq 10$  was considered clinically significant.

#### **PCL-5 (PTSD Checklist for DSM-5)**

The PCL-5 is a 20-item self-report questionnaire designed to measure the severity of post-traumatic

stress disorder (PTSD) symptoms according to DSM-5 criteria. It covers four clinical domains: intrusion symptoms (memories, nightmares, flashbacks), avoidance behaviors, negative alterations in cognition and mood (guilt, detachment, negative emotions), and hyperarousal symptoms (irritability, startle, sleep disturbance). Each item is scored from 0 ("not at all") to 4 ("extremely"), yielding a total score from 0 to 80. In this study, a cut-off score of 32 was used to identify probable PTSD.

#### **WHO-ASSIST (Alcohol, Smoking and Substance Involvement Screening Test)**

The WHO-ASSIST is a screening tool developed by the World Health Organization to identify individuals at moderate or high risk of problematic use of psychoactive substances. Its objective is to support early detection and guide appropriate intervention. The test evaluates the use of tobacco, alcohol, cannabis, sedatives, cocaine, amphetamines, hallucinogens, opioids, and other substances. It explores dimensions such as frequency of use, craving, health and social consequences, impairment of responsibilities, concern expressed by others, and unsuccessful attempts to reduce use. A score is generated for each substance, classified into three categories: low-risk use, hazardous use (requiring brief intervention), and problematic use or dependence (requiring specialized referral).

#### **PHQ-15 (Patient Health Questionnaire-15)**

The PHQ-15 is a self-report questionnaire that evaluates the severity of 15 common physical symptoms experienced over the previous four weeks. Each symptom is rated on a 3-point scale (0 = "not bothered at all," 1 = "bothered a little," 2 = "bothered a lot"). The total score ranges from 0 to 30 and is interpreted as follows: 0–4 = minimal or absent, 5–9 = mild, 10–14 = moderate, and 15–30 = severe somatic symptom burden.

#### **FSFI (Female Sexual Function Index)**

The FSFI is a 19-item questionnaire assessing female sexual function across six domains during the previous four weeks: desire, arousal, lubrication, orgasm, satisfaction, and pain. Scores from each domain are summed to provide a total score ranging from 2 to 36. A total score <26.55 is considered indicative of sexual dysfunction.

## Data management and quality control

Data from finalized medico-legal reports were entered into REDCap by study staff, including an epidemiologist, research nurses, and medical student interns. Each case was assigned a unique identifier to ensure confidentiality.

At Geneva University Hospitals (HUG), data were extracted directly from the electronic sexual assault report (eSAR)—a standardized digital medico-legal file introduced in 2022, which ensures the structured collection of all relevant variables. In contrast, Lausanne University Hospital (CHUV) and Hôpital du Valais continued to use Word-based report templates following the same medico-legal protocol but without automated data export. For these sites, data were manually entered into REDCap by the research team. REDCap's quality control measures, including outlier detection and consistency checks, were used to identify potential data entry errors. Manual validation was also performed by reviewing records and verifying a random sample for discrepancies between original reports and database entries. Any inconsistencies were corrected, and once validation was complete, the dataset was locked for analysis.

## Definitions

For a full list of all variables and definitions, please see Annex 1.

## Ethics approval and Funding

This research project was approved by the Cantonal Research Ethics Commission of Geneva, Vaud, Valais and Ticino, Switzerland (CCER Project ID 2022-01144), and conducted in accordance with the Declaration of Helsinki, the principles of Good Clinical Research Practices (GRC), the Human Research Act (HRA) and the Human Research Ordinance (HRO), as well as other locally relevant regulations<sup>[7-9]</sup>. This project is equally funded by the Swiss Federal Office for Gender Equality (FOGE) and the Geneva University Hospitals, as part of the project entitled, "Sexual Assault Reporting— A study to improve prevention, information and care after sexual assault in emergency care settings".

## Data analysis

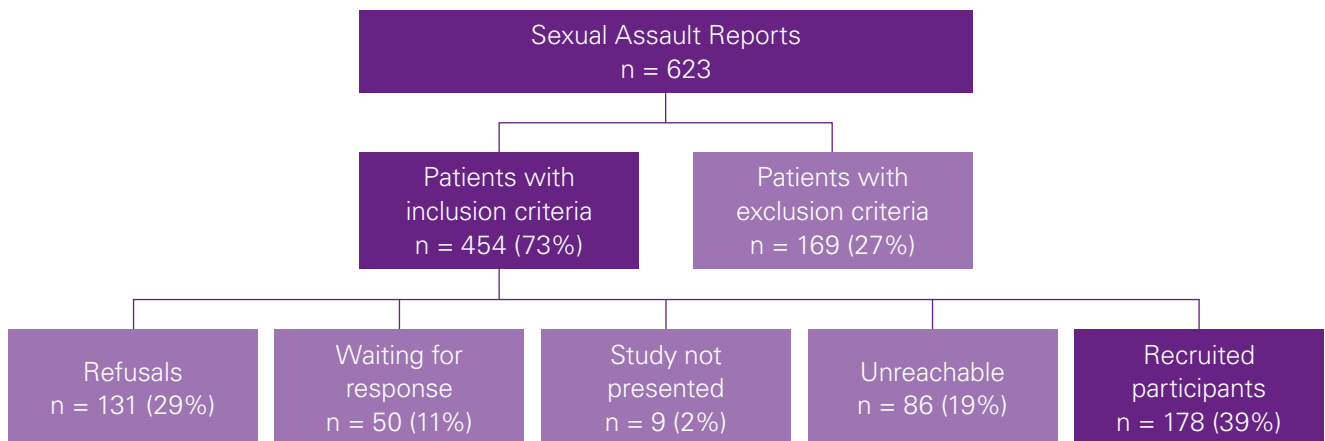
Descriptive statistics were provided to describe the sociodemographic and clinical characteristics of the patients reporting a sexual assault as well as the characteristics of the sexual assault itself. Statistical analyses were performed using the R base package of R software, version R-4.2.2 (R Foundation for Statistical Computing, Vienna, Austria. URL <https://www.R-project.org/>.) The data from this study and the analytical code used will be shared in an open data repository.

# Results

A total of 623 sexual assault cases were reported across participating hospitals during the 25-month study period (November 2022 – December 2024). Among these, 454 met the inclusion criteria, while 169 were excluded. Several records had multiple exclusion criteria. Of the 169 excluded cases, 75 involved minors under the age of 16, 6 were cisgender men or boys, 44 concerned patients lacking decisional capacity, 12 were recurrent cases with more than three reported assaults, and 43 involved patients who could not communicate in one of the study languages or through a certified interpreter.

Of the 454 eligible patients, 131 declined participation, 50 were still deciding at the time of data closure, and 86 could not be reached. As of December 31, 2024, a total of 181 patients were enrolled in the study. Among these, 178 participants (39% of eligible patients) had a completed medico-legal sexual assault report (constat d'agression sexuelle, CAS), which constituted the analytical sample presented in this report. Three participants had consented to data reuse but did not yet have a finalized medico-legal report at the time of data extraction.

**Figure 1:** Flow Chart



## Sociodemographic characteristics

**Table 1:** Frequency of sexual assaults by year, site and sociodemographic characteristics of cases reported at the participating hospitals (2022-2024). All data are n (%).

| Variable            | Responses           | N= 178         | Variable              | Responses                    | N= 178   |
|---------------------|---------------------|----------------|-----------------------|------------------------------|----------|
| Age                 | Median (IQR)        | 27 (29-34)     | Season                | Winter                       | 53 (30)  |
|                     | Range               | 16-68          |                       | Spring                       | 48 (27)  |
| Minor               | 16-17 years         | 21 (12)        |                       | Summer                       | 37 (21)  |
| Site                | EHC                 | 2 (1)          |                       | Fall                         | 40 (22)  |
|                     | eHnv                | 3 (2)          |                       | Unknown                      | 0        |
|                     | GHOL                | 6 (3)          | Civil Status          | Single                       | 129 (82) |
|                     | HIB                 | 1 (1)          |                       | Married                      | 11 (7)   |
|                     | HRC                 | 4 (2)          |                       | Cohabiting                   | 8 (5)    |
|                     | HUG                 | 105 (59)       |                       | Divorced                     | 6 (4)    |
|                     | CHUV                | 29 (16)        |                       | Separated                    | 4 (3)    |
| VS                  | 28 (16)             | Not applicable | 20                    |                              |          |
| Year of the assault | 2022                | 15 (8)         | Patient's nationality | Europe                       | 117 (81) |
|                     | 2023                | 99 (56)        |                       | ...Switzerland               | 67 (46)  |
|                     | 2024                | 64 (36)        |                       | Americas                     | 13 (9)   |
|                     | Missing             | 0              |                       | Middle East and North Africa | 8 (6)    |
| Weekend or Weekday  | Weekday (Mon.-Fri.) | 88 (50)        |                       | Sub-Saharan Africa           | 6 (4)    |
|                     | Weekend (Sat.-Sun.) | 88 (50)        |                       | Asia                         | 1 (1)    |
|                     | Missing             | 2              |                       |                              |          |

Table 1 provides details on the sociodemographic characteristics of the 178 patients presenting to the hospital emergency departments for a sexual assault. Age ranges from 16-68 years with the median age of 27 years (IQR 20–34).

Fifty percent (n=88) of all sexual assaults took place during the weekend, on either a Saturday or Sunday. The winter months accounted for the highest frequency of sexual assault consultations (30%), followed by spring (27%), fall (22%), and summer (21%).

Most of the patients were from Switzerland (46%) or other European countries (35%), followed by persons

from North, Central or South America (9%). A small proportion of patients presenting for sexual assaults were originally from Sub-Saharan Africa (4%), and the Middle East and/or North Africa (6%) as well as Asia (1%). The nationality of 19% of the study participants was marked as unknown, because there was no mention of their citizenship on their sexual assault report.

Among the 158 patients for whom civil status was reported, 82% were single, 7% were married, and 5% were in cohabitation. A smaller proportion were divorced (4%) or separated (3%). In 20 of the sexual assault reports, civil status was missing.

## Assault characteristics

**Table 2:** Frequency of sexual assault characteristics of cases reported at the participating hospitals (2022-2024). All data are n (%).

| Variable                      | Responses                               | N=178                          | Variable                         | Responses               | N=178    |
|-------------------------------|---|--------------------------------|----------------------------------|-------------------------|----------|
| Assault location              | Home                                    | 98 (57)                        | Menarche                         | No                      | 3 (2)    |
|                               | ...Assailant's home                     | 48 (28)                        |                                  | Yes                     | 173 (98) |
|                               | ...Patient's home                       | 37 (21)                        |                                  | Missing                 | 2        |
|                               | ...Friend/family member's home          | 9 (5)                          | Menopausal                       | Menopausal              | 10 (6)   |
|                               | ...Couple's home                        | 4 (2)                          |                                  | Non-menopausal          | 160 (94) |
|                               | Public                                  | 33 (19)                        |                                  | Missing                 | 3        |
|                               | ...Common Space (residential building)  | 4 (2)                          | Menstruating at time of assault* | Yes                     | 12 (8)   |
|                               | ...Street                               | 16 (9)                         |                                  | No                      | 144 (92) |
|                               | ...Public Transportation                | 1 (1)                          |                                  | Missing                 | 4        |
|                               | ...Toilet                               | 6 (3)                          | Contraception*                   | Yes                     | 70 (45)  |
|                               | ...Forest/Park                          | 6 (3)                          |                                  | No                      | 84 (55)  |
|                               | Other                                   | 21 (12)                        |                                  | Missing                 | 6        |
|                               | ...Hotel                                | 9 (5)                          | Pregnant*                        | Yes                     | 2 (1)    |
|                               | ...School                               | 3 (2)                          |                                  | No                      | 157 (99) |
|                               | ...Workplace                            | 6 (3)                          |                                  | Missing                 | 1        |
|                               | ...Car                                  | 3 (2)                          | First vaginal penetration        | No                      | 157 (94) |
|                               | Unable to recall (amnesia)              | 18 (10)                        |                                  | Yes                     | 10 (6)   |
| Institutional care setting    | 3 (2)                                   | Missing                        |                                  | 11                      |          |
| Missing                       | 5                                       | Recent sexual contact (5 days) | No                               | 116 (72)                |          |
| Number of perpetrators        | One                                     |                                | 135 (76)                         | Yes                     | 44 (28)  |
|                               | Multiple                                |                                | 14 (8)                           | Missing                 | 18       |
|                               | Unable to recall (amnesia)              | 20 (11)                        | Bathed/Washed body before exam   | No                      | 54 (34)  |
|                               | Unknown (no amnesia)                    | 8 (5)                          |                                  | Yes                     | 107 (66) |
|                               | Missing                                 | 1                              |                                  | Missing                 | 17       |
| Known assailant               | No                                      | 48 (27)                        | Changed clothes before exam      | No                      | 44 (28)  |
|                               | Yes / Yes & No ( $\geq 1$ assailants)   | 105 (58)                       |                                  | Yes                     | 111 (72) |
|                               | ...Friend/colleague/peer/acquaintance   | 52 (50)                        |                                  | Missing                 | 23       |
|                               | ...Former intimate partner              | 13 (12)                        | Habitual alcohol consumption     | No                      | 40 (23)  |
|                               | ...Social network/internet acquaintance | 13 (12)                        |                                  | Occasionally            | 101 (58) |
|                               | ...Authority figure/care provider       | 11 (10)                        |                                  | Regularly               | 32 (18)  |
|                               | ...Current intimate partner             | 9 (9)                          |                                  | Daily                   | 2 (1)    |
|                               | ...Other (known to patient)             | 4 (4)                          | Missing                          | 3                       |          |
|                               | ...Family member                        | 3 (3)                          | Alcohol prior to assault         | No                      | 55 (31)  |
|                               | Unable to recall (amnesia)              | 24 (14)                        |                                  | Yes                     | 121 (69) |
|                               | Missing                                 | 1                              |                                  | Missing                 | 2        |
| Mandated by Police/Prosecutor | Yes                                     | 47 (26)                        | Habitual drug consumption        | No                      | 109 (62) |
|                               | No                                      | 131 (74)                       |                                  | Occasionally            | 48 (27)  |
| Charges filed                 | Yes                                     | 40 (29)                        |                                  | Regularly               | 13 (7)   |
|                               | No                                      | 100 (71)                       |                                  | Daily                   | 5 (3)    |
|                               | Missing                                 | 38                             | Missing                          | 3                       |          |
| Prior sexual assault          | Yes                                     | 70 (61)                        | Drug use prior to assault        | No                      | 138 (79) |
|                               | No                                      | 45 (38)                        |                                  | Yes                     | 36 (21)  |
|                               | Missing                                 | 63                             |                                  | Missing                 | 4        |
| Time to examination           | <24 h                                   | 80 (45)                        | Amnesia                          | No                      | 106 (60) |
|                               | 24–48 h                                 | 38 (21)                        |                                  | Yes (Partial)           | 39 (22)  |
|                               | 48–72 h                                 | 27 (15)                        |                                  | Yes (Complete)          | 33 (19)  |
|                               | 72 h–4 days                             | 8 (5)                          | Psychological violence           | Yes (>1 type possible)  | 28 (16)  |
|                               | 4 days–1 week                           | 15 (8)                         |                                  | ...Intimidation/threats | 21 (75)  |
|                               | 1 week–1 month                          | 8 (5)                          |                                  | ...Humiliation          | 7 (25)   |
|                               | >1 month                                | 1 (1)                          |                                  | ...Control              | 6 (21)   |
|                               | Missing                                 | 1                              |                                  | ...Harassment           | 1 (4)    |
| Physical violence             | Yes (>1 type possible)                  | 81 (46)                        |                                  | ...Neglect/Isolation    | 1 (4)    |
|                               | ...Held or restrained                   | 57 (70)                        |                                  | ...Other                | 5 (18)   |
|                               | ...Shoved or pushed                     | 35 (43)                        |                                  | No                      | 93 (54)  |
|                               | ...Hit (slap, kick, etc.)               | 15 (19)                        | Unable to recall (amnesia)       | 51 (30)                 |          |
|                               | ...Strangled or suffocated              | 14 (17)                        | Missing                          | 6                       |          |
|                               | ...Pulled by the hair                   | 13 (16)                        |                                  |                         |          |
|                               | ...Bitten                               | 4 (5)                          |                                  |                         |          |
|                               | ...Other                                | 1 (1)                          |                                  |                         |          |
|                               | No                                      | 45 (26)                        |                                  |                         |          |
|                               | Unable to recall (amnesia)              | 50 (28)                        |                                  |                         |          |
|                               | Missing                                 | 2                              |                                  |                         |          |

\* Percentages were calculated among post-menarche, non-menopausal patients, with denominators varying depending on data availability (excluding missing data).

Regarding gender, 177 participants (99%) identified as women and one (1%) as a transgender man. Sexual orientation was reported for 89 participants: 79 (89%) identified as heterosexual, 4 (4%) as homosexual, 5 (6%) as bisexual, and 1 (1%) as pansexual. It was not reported for the remaining 89 participants. When information was available, the perpetrator was always male in 142 cases (99%), except for one case (1%) involving multiple perpetrators of different genders. In the remaining cases, amnesia regarding the perpetrator's gender was reported, except for 13 cases in which the information was missing.

In 58% of the sexual assaults, the patient reported knowing the assailant, while 27% of patients did not previously know the person who sexually assaulted them. Fourteen percent of patients could not state whether they knew the assailant due to amnesia, and in 2% of cases there were both known and unknown assailants. Of those who knew their assaulter, 50% were a friend/colleague/peer/or acquaintance. Current intimate partners (9%) and former intimate partners (12%) represented a proportion of known assailants. Family members (3%), authority figures (10%) and contacts met via social networks or the internet (12%) were also cited as perpetrators.

In 8% of cases, there were multiple perpetrators, where the assailants were mostly a combination of known and unknown. There was one assailant in 76% of the sexual assault cases, and 16% of the patients did not know the number of perpetrators because of amnesia. Among patients with available data, 39% reported that this was their first sexual assault, while 61% reported at least one prior sexual assault.

The Police or the public prosecutor ordered 26% of the sexual assault medico-legal examinations, while 74% came to the emergency department seeking care on their own volition. Among patients with available data, 29% reported having filed a complaint, while 71% had not. Among those who had not yet filed a complaint, 5% stated that they did not intend to press charges, and 5% declared that they intended to bring charges against their aggressor, while 46% did not know.

Forty-five percent of patients presented for emergency care within 24 hours of the sexual assault, 21% within 24–48 hours, and 15% within 48–72 hours, totalling 81% within the first 3 days. Five percent came to the hospital between 72 hours and 4 days, 8% between 4 and 7 days, 5% between one week and one month, and 1% after more than one month.

Forty percent of patients experienced some form of amnesia—either partial (22%) or total (19%). We are unable to differentiate between amnesia due to trauma (peritraumatic dissociation) and amnesia due to alcohol or substance use.

Substance use was widely prevalent in our sample: 69% reported consuming alcohol prior to the sexual assault, 21% reported using drugs, and 29% reported taking prescription medications. When asked about their drinking habits, 77% responded that they drink alcohol, of which 58% drink occasionally, 18% regularly, and 1% daily. When asked about their drug habits, 38% responded that they use drugs, of which 27% use occasionally, 7% regularly, and 3% daily. Among persons using drugs, the most frequently cited were cannabis or hashish (83%), cocaine (20%) and Ecstasy/MDMA (9%).

**Table 3:** Sexual assault penetration sites and penetrant types (penile, digital, tongue, object and other) (n=178). All data are n (row percentage). There may be more than 1 penetration site or penetrant type per person.

| Penetration site | Yes      | No      | NSP (Not amnesia) | NSSP (Amnesia) | Missing | Penile penetration | Ejaculation (Yes) | Ejaculation (No) | Ejaculation (NSP) | Ejaculation (NSSP) | Digital (Finger) | Tongue | Object |
|------------------|----------|---------|-------------------|----------------|---------|--------------------|-------------------|------------------|-------------------|--------------------|------------------|--------|--------|
| Vaginal          | 115 (65) | 10 (6)  | 4 (2)             | 47 (27)        | 2 (1)   | 94 (82)            | 32 (34)           | 30 (32)          | 23 (24)           | 9 (10)             | 44 (38)          | 8 (7)  | 2 (2)  |
| Anal             | 24 (14)  | 90 (51) | 8 (5)             | 54 (31)        | 2 (1)   | 18 (75)            | 4 (22)            | 9 (50)           | 4 (22)            | 1 (6)              | 8 (33)           | –      | 1 (4)  |
| Oral             | 33 (19)  | 90 (51) | 3 (2)             | 51 (29)        | 1 (1)   | 29 (88)            | 4 (14)            | 17 (59)          | 4 (14)            | 4 (14)             | 1 (3)            | 5 (15) | –      |

NSP = ne sait pas (does not know), NSSP = ne se souvient pas (does not remember)

Approximately 27% of the patients were unable to recall or specify which types of penetration (if any) they were subjected to, because of amnesia. Vaginal penetration was reported by 65%, anal penetration by 14%, and oral penetration by 19% (Table 3). A number of patients reported more than one penetration site (two sites penetrated: n = 36; three sites penetrated: n = 6).

Of the persons who reported vaginal penetration, penile penetration was reported in 82% of cases, and digital penetration in 38% of cases.

Oral–genital contact with the tongue was reported in 7% of cases, and penetration with an object in 2%. Condom use during vaginal penetration was reported in 9% of cases. Ejaculation was reported in 34% of sexual assaults with vaginal–penile penetration.

Of the persons who reported anal penetration, penile penetration was reported in 75% of cases, and digital penetration in 33% of cases. Penetration with an object was reported in 4%. Condom use during anal penetration was reported in 6% of cases. Ejaculation was reported in 22% of anal–penile penetrations.

Oral penetration was reported in 19% of patients, most frequently with the penis (88%), followed by the tongue (15%) and the finger (3%). Condom use during oral penetration was reported in 7% of cases. Ejaculation was reported in 14% of oral penetrations. Four patients (14%) reported that they did not know, and another four patients (14%) reported that they could not remember due to amnesia.

Ejaculation elsewhere on the body, outside the genital or oral sites, was reported in 7% of cases. Twenty percent of patients did not know, and 19% could not remember due to amnesia.

For 10 patients (6%), the sexual assault was their first vaginal penetration. In line with the age structure of the sample, 6% of the patients confirmed that they had undergone menopause. Forty-five percent of the patients were currently using some form of contraception, 8% were menstruating at the time of the assault, and 1% was pregnant. Almost 60% declared that a condom was not used during the assault, and only 6% of the participants noted the use of a condom. Condom use could not be specified in 32% of cases due to amnesia.

Physical violence was described in 46% of sexual assaults. Various types of physical violence were employed, such as being held down against their will (70%), shoved or pushed (43%), hit (19%) or strangled (17%). The use of a weapon was recorded in 3% of sexual assault cases, most frequently knives, but also blunt objects.

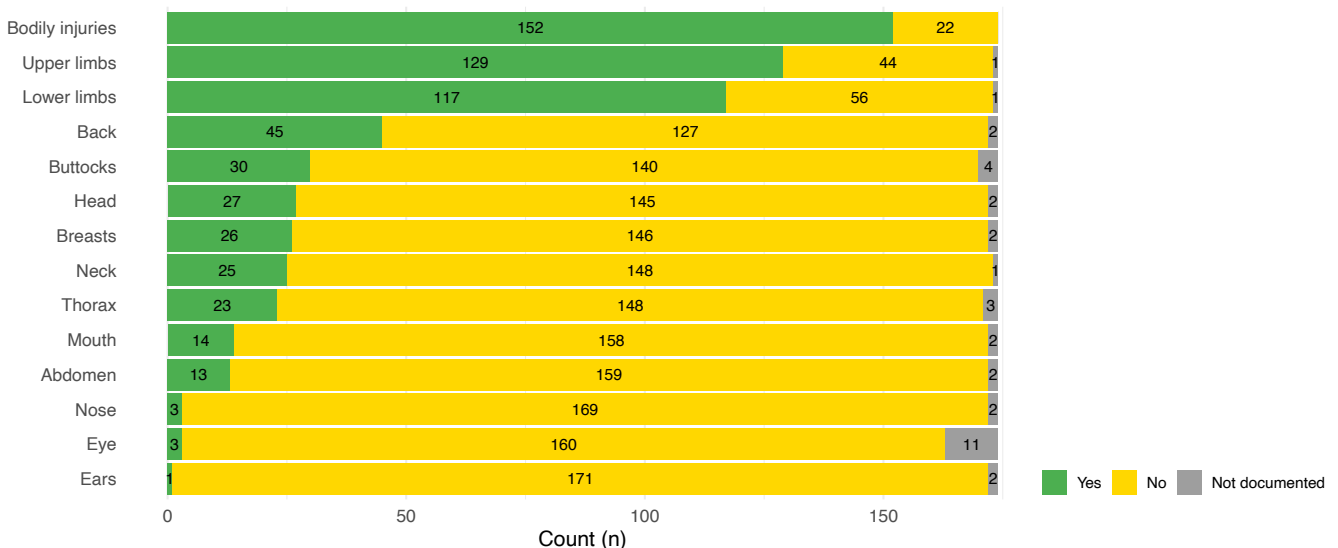
Psychological violence was reported in 16% of sexual assaults. The most frequently reported types were threats and intimidation (75%), followed by humiliation (25%) and control (21%).

The forensic doctors recorded body injuries in 87% of the sexual assault reports (Figure 2). In order of incidence, upper limb injuries (75%) and lower limb injuries (68%), followed by injuries to the back (26%), buttocks (18%), head/face (16%), breasts (15%), neck (14%) and thorax (13%) were the most frequently recorded injuries to the body.

### Gynaecological exam

Of the 178 patients reporting sexual assault, a gynaecological exam was performed in 173 cases (98%). In five cases, no exam was performed: three were deemed non-pertinent, one was refused, and for one patient the information was missing.

**Figure 2:** Frequency of bodily injuries among patients who had a forensic examination (n=174). Data are presented as n.



### Genital injuries

Of the 173 patients who underwent a gynaecological examination, 29% presented with genito-anal injury. Genital injuries alone were observed in 44 patients (26%), while anal injuries were recorded in 8 patients (5%). The most frequent sites of genital injury were the vulva (18%), followed by the hymen (5%), perineal raphe (4%), vagina (4%), urethral opening (1%), and cervix (1%) (Figure 3).

Among the genital injuries documented, the most common types were erythema (9%), abrasion (8%), erosion (6%), and tears or bruising (4%), with open wounds (1%) being less frequent. Anal injuries, when present, most often consisted of erythema and superficial tears.

**Figure 3:** Frequency of genital injuries among patients who had a gynaecological examination (n=173). Data are presented as n.



**Figure 4** Frequency of genital lesions among patients who had a gynaecological examination (n=173). Data are presented as n.



Among patients with injuries, the majority were aged 18–49 years (84%), with smaller proportions among adolescents aged 16–17 (9%) and patients aged 50 years and older (9%). Timing of consultation was an important factor: 44% of injuries were detected when the exam was performed within 24 hours of the assault, 23% within 24–48 hours, and 25% within 48–72 hours. Beyond 72 hours, detection rates decreased markedly, with only isolated cases recorded after one week.

Vulvar injury was the most frequent site for genital injury, specifically on the inner and outer labia (7%), the fourchette (5%), and the posterior commissure (3%).

### Anal injuries

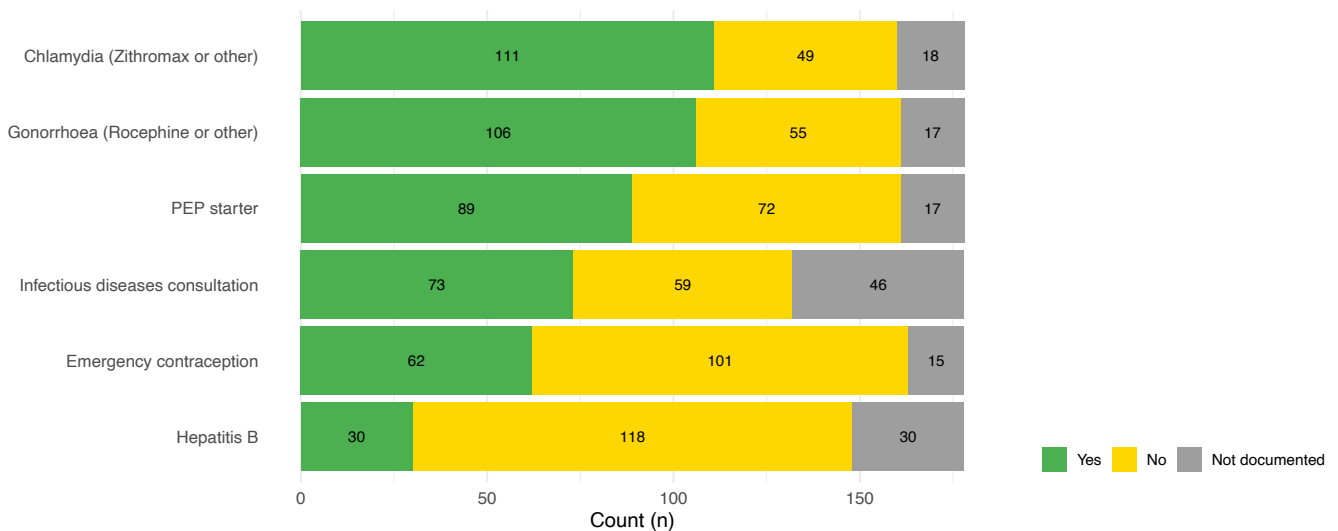
Of the 173 patients who underwent gynaecological examination, 5% presented with anal injury. Among the 24 patients reporting anal penetration, 33% presented with injury.

### Treatment and Follow-up

Emergency contraception was administered to 62 patients (38%), while 101 (62%) did not receive it.

Figure 5). The main reasons for non-administration were ongoing use of contraception (n=56), refusal (n=10), no penile penetration reported (n=8), post-menopause (n=7), consultation outside the recommended time window (n=6), or an ongoing pregnancy (n=2). In 12 cases (8%), the reason was unknown or missing.

**Figure 5:** Treatments Given, Follow-up Proposed (n=178). Data are presented as n.



Antibiotic prophylaxis for gonorrhoea (Ceftriaxone) was administered to 106 patients (66%). For the 55 patients (34%) who did not receive this treatment, the main reasons were refusal (n=22) or absence of reported penetration (n=12). In 19 cases, the reason was not specified. Similarly, antibiotic prophylaxis

against chlamydia (Azithromycin) was given to 111 patients (69%), while 49 (31%) did not receive it. Reasons were refusal (n=19), no penetration (n=10), or unspecified (n=18).

Prophylaxis against hepatitis B was administered to 30 patients (20%). Among the 118 patients (80%) who did not receive it, the most frequent reason was a complete prior vaccination (n=65). Twelve patients refused, eight cases involved sexual assaults without penetration, and in 32 cases the information was missing.

Post-exposure prophylaxis against HIV (PEP) was prescribed to 89 patients (55%). The 72 patients (45%) who did not receive PEP were distributed between consultation outside the 48-hour window (n=35), no penetration reported (n=10), refusal (n=9), or a medical decision of no indication (n=6). In one case, the patient was already on antiviral therapy, and in 10 cases the reason was not specified.

Finally, 73 patients (55%) received a follow-up consultation with an infectious disease specialist, while 59 (45%) did not. At the Geneva site, 90% of patients were referred to the UIMPV, while 10% were not, most often because they were already followed by a psychiatrist or psychologist (n=6) or refused the referral (n=3).

## Pre-existing medical conditions

Pre-existing conditions were reported in 79 patients (44%) at the time of the medico-legal consultation (Table 5). Among these, 30% (n = 54) presented with one or more somatic conditions, and 26% (n = 47) had documented psychiatric disorders.

The most frequently reported somatic conditions were asthma (5%), hypothyroidism (4%), and epilepsy (4%), followed by hypertension (1%) and various other medical conditions (20%).

Among psychiatric conditions, depression (15%) and anxiety disorders (6%) were the most common, followed by borderline personality disorder (4%), substance use disorders (2%), schizoaffective disorder (2%), bipolar disorder (2%), and post-traumatic stress disorder (1%). Other psychiatric diagnoses were reported in 6% of patients.

These data show that a considerable proportion of individuals consulting for sexual assault had a pre-existing medical or psychiatric condition, which may contribute to their overall vulnerability and influence both their acute and long-term health trajectories following the assault.

**Table 4:** Pre-existing conditions among included patients (n = 178). All data are presented as n (%).

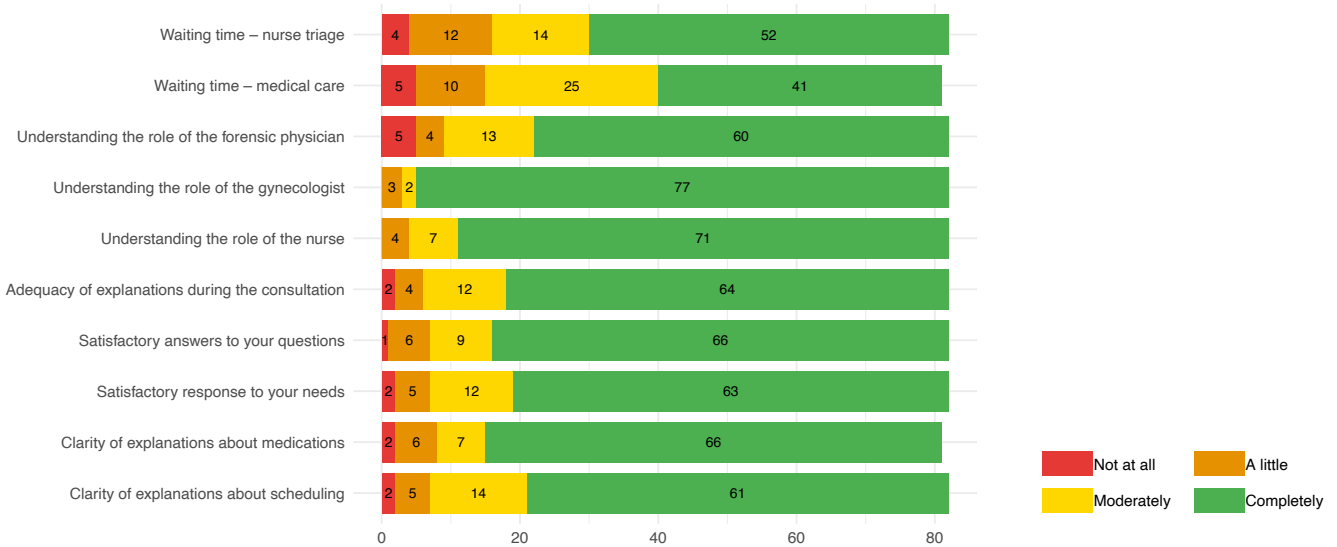
| Category                       | Condition/Disorder                       | N=178   |
|--------------------------------|--|---------|
| Pre-existing condition         | ≥1 pre-existing condition                | 79 (44) |
| Somatic conditions             | ≥1 somatic condition                     | 54 (30) |
|                                | ...Asthma                                | 9 (5)   |
|                                | ...Hypothyroidism                        | 7 (4)   |
|                                | ...Epilepsy                              | 7 (4)   |
|                                | ...Hypertension                          | 2 (1)   |
|                                | ...Other somatic conditions              | 36 (20) |
| Psychiatric conditions         | ≥1 psychiatric condition                 | 47 (26) |
|                                | ...Depression                            | 27 (15) |
|                                | ...Anxiety disorders                     | 11 (6)  |
|                                | ...Borderline personality disorder       | 7 (4)   |
|                                | ...Substance use disorders               | 4 (2)   |
|                                | ...Schizoaffective disorder              | 4 (2)   |
|                                | ...Bipolar disorder                      | 4 (2)   |
|                                | ...Post-traumatic stress disorder (PTSD) | 2 (1)   |
| ...Other psychiatric disorders | 11 (6)                                   |         |

## Emergency Department Consultation – Baseline

At the time of the emergency consultation (n = 178), patients reported overall satisfaction with the quality of care and information received. The majority reported a very good understanding of the respective roles of the gynecologist, forensic doctor, and nurse. Satisfaction with the explanations provided was also high, with 80% satisfied with the explanations about proposed treatments and 80% satisfied with the responses to their questions and expressed needs. Seventy-four percent were satisfied with the organization of follow-up appointments.

Regarding waiting times, 50% were completely satisfied with the waiting time before being attended by medical staff, and 63% were completely satisfied with the waiting time before triage by the nurse. While waiting time was the aspect rated slightly lower than others, it still reflects that at least half of patients were fully satisfied, and overall satisfaction remained high. Patients emphasized the quality of the listening and explanations received, as well as a good understanding of the care pathway and the professionals involved.

**Figure 6:** Patient satisfaction and comprehension during Emergency Department Consultation (n=82). Data are presented as n.

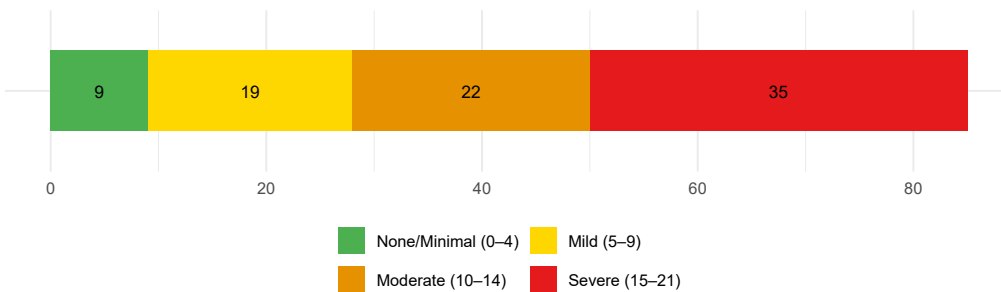


## Generalized Anxiety Disorder 7-item Scale (GAD-7)

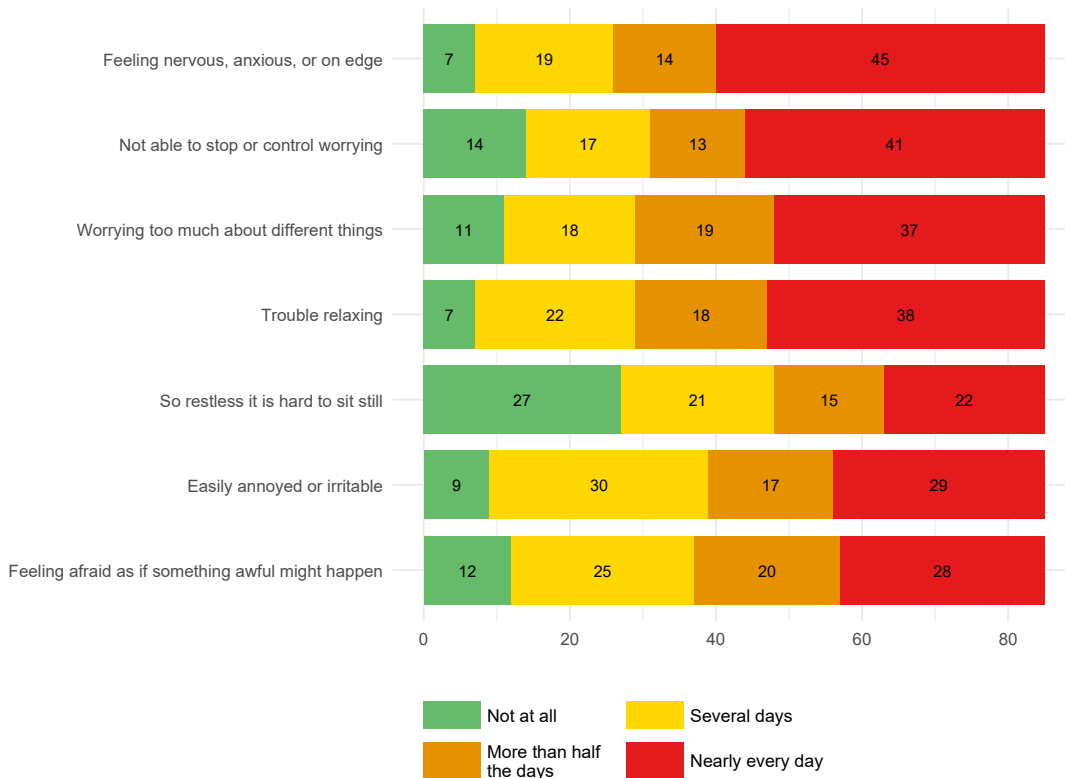
At three months, 85 patients completed the GAD-7. Clinically significant anxiety (score  $\geq 10$ ) was observed in 67% of respondents, including 35 patients (41%) with severe anxiety (scores 15–21) and 22 patients (26%) with moderate anxiety (scores 10–14). An additional 19 patients (22%) reported mild symptoms,

while only 9 patients (11%) had minimal or no symptoms. Patients most often described nervousness, difficulties relaxing, inability to control worries, irritability, and marked physical agitation, reflecting a high burden of distress in the early aftermath of the assault.

**Figure 7:** GAD-7 total score categories at 3 months (n=85).



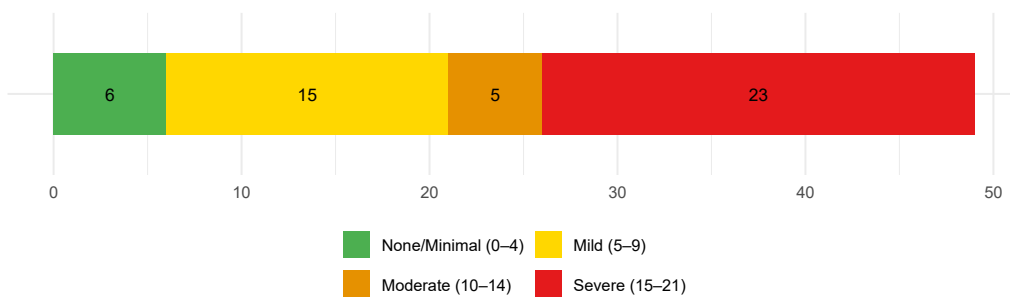
**Figure 8:** GAD-7 item responses at 3 months (n=85). Data are presented as n.



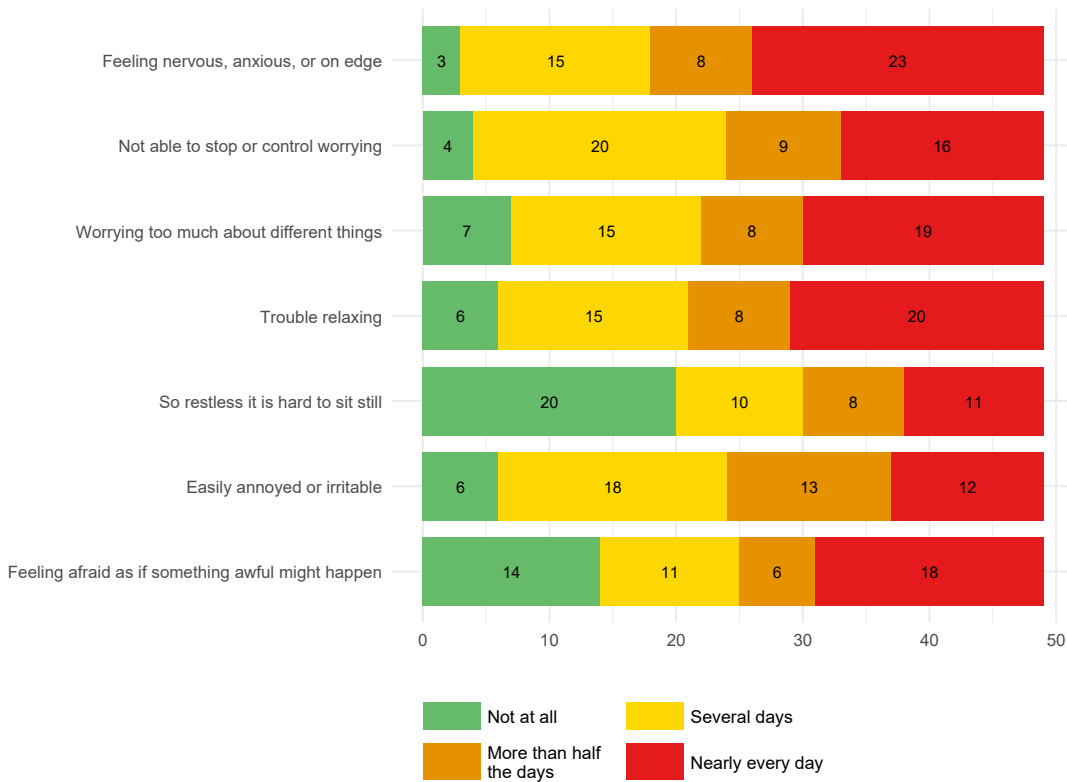
At twelve months, 49 patients completed the GAD-7. Clinically significant anxiety persisted in 57% of respondents, including 23 patients (47%) with severe anxiety and 5 patients (10%) with moderate anxiety. A further 15 patients (31%) reported mild symptoms and 6 patients (12%) minimal symptoms. The most frequent complaints remained nervousness, uncontrol-

lable worry, difficulties relaxing, irritability, and motor agitation. Although the overall prevalence of clinically significant anxiety decreased compared to 3 months, the persistence of severe anxiety in nearly half of the sample underscores the chronic nature of these symptoms for many patients.

**Figure 9:** GAD-7 total score categories at 12 months (n=49).



**Figure 10:** GAD-7 item responses at 12 months (n=49). Data are presented as n.

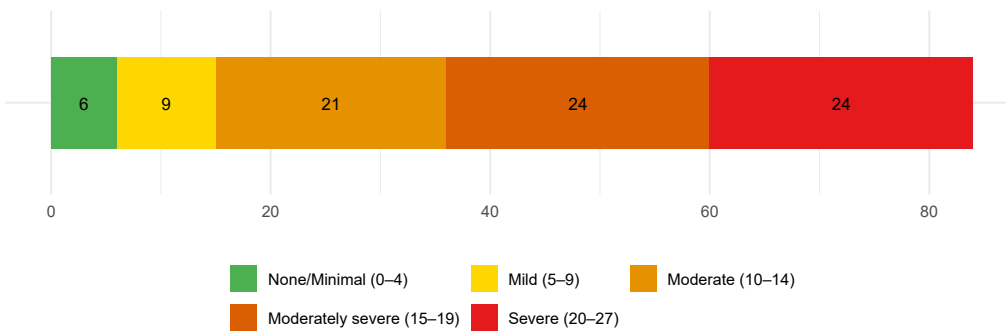


### Patient Health Questionnaire Depression Screener (PHQ-9)

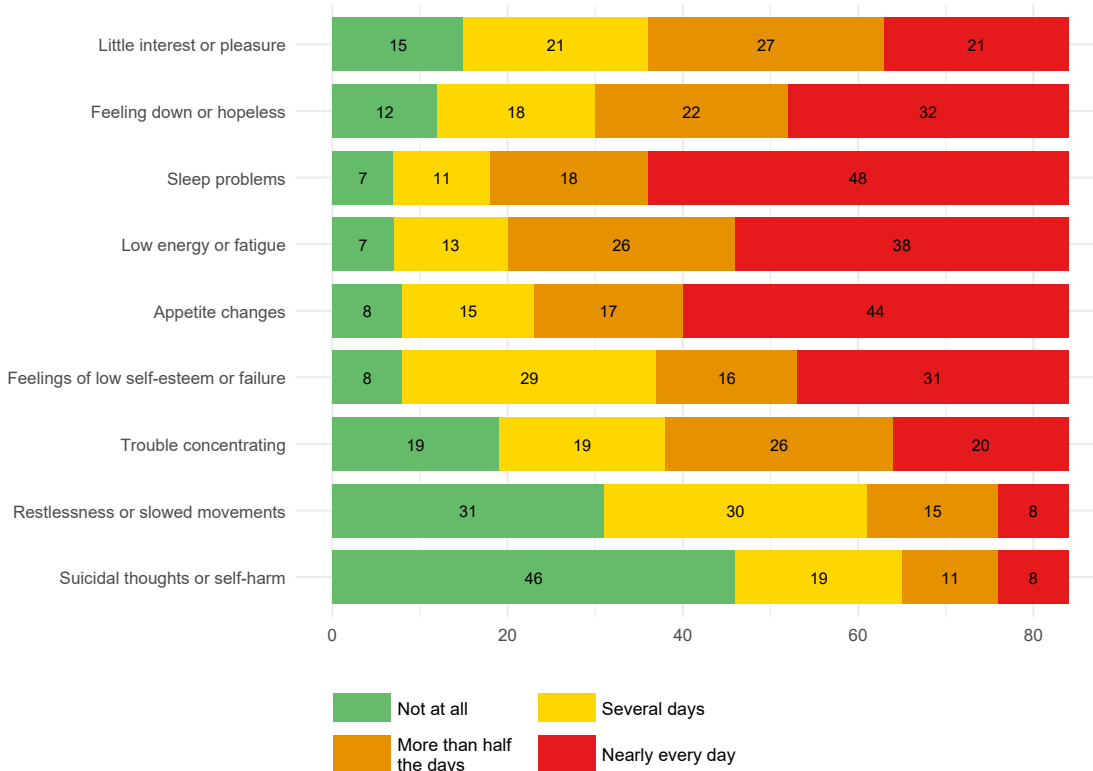
At the 3-month follow-up, 84 patients completed the PHQ-9. Clinically significant depression (score  $\geq 10$ ) was present in 82% of respondents, including 24 patients (29%) with severe depression (scores 20–27), 24 patients (29%) with moderately severe depression (scores 15–19), and 21 patients (25%) with moderate depression (scores 10–14). An additional 9 patients (11%) reported mild symptoms, and

6 patients (7%) minimal symptoms. The most frequently reported depressive symptoms were sleep disturbance (79%), fatigue or lack of energy (76%), appetite changes (73%), sadness or hopelessness (64%), and low self-esteem (56%). Thirty-eight patients (45%) reported suicidal ideation or thoughts of self-harm occurring several days or more in the previous two weeks.

**Figure 11:** PHQ-9 total score categories at 3 months (n=84).



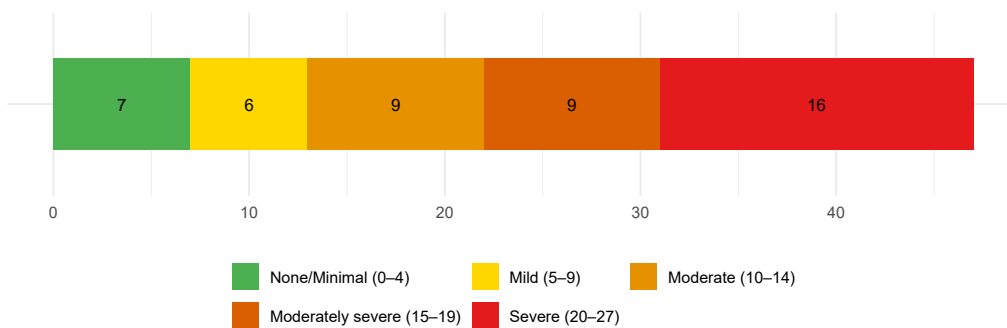
**Figure 12:** PHQ-9 item responses at 3 months (n=84). Data are presented as n.



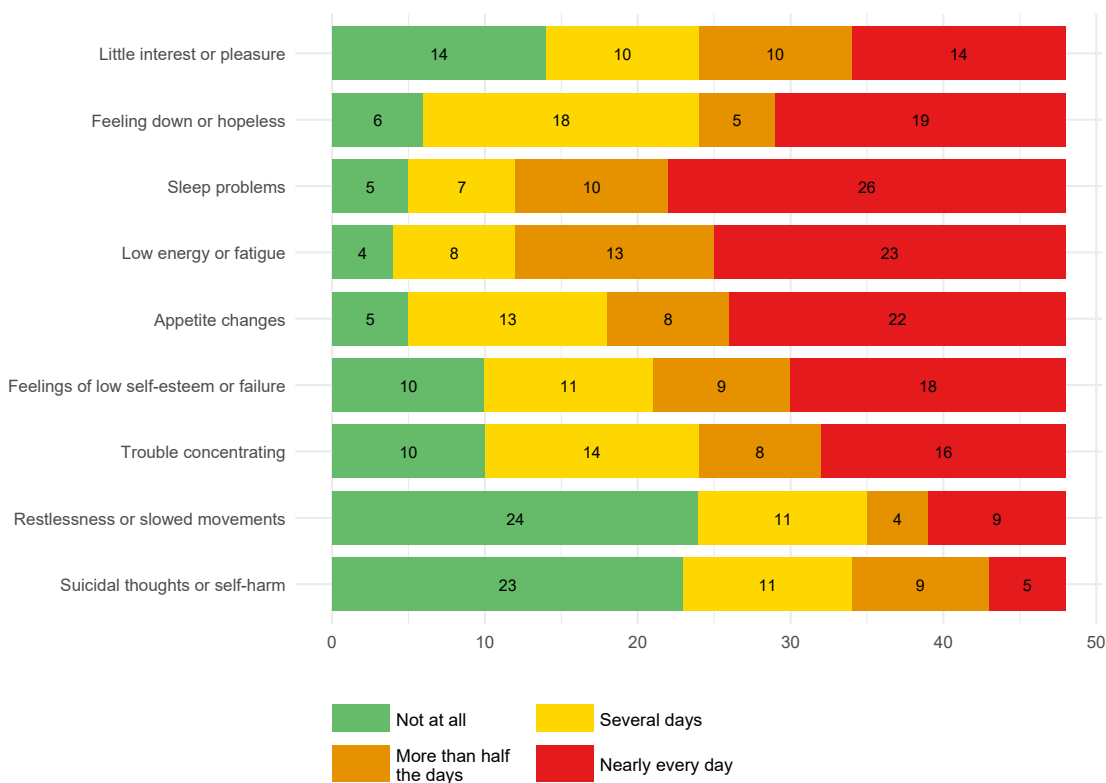
At the 12-month follow-up, 48 patients completed the PHQ-9. Clinically significant depression remained present in 71% of respondents, with 16 patients (33%) reporting severe depression, 9 patients (19%) moderately severe, and 9 patients (19%) moderate depression. A further 6 patients (13%) reported mild depression and 7 patients (15%) minimal symptoms.

The most frequent depressive symptoms remained fatigue or lack of energy (75%) and sleep disturbance (75%), followed by low self-esteem (56%), difficulty concentrating (50%), and appetite changes (48%). Twenty-five patients (52%) reported suicidal ideation or thoughts of self-harm occurring several days or more in the previous two weeks.

**Figure 13:** PHQ-9 total score categories at 12 months (n=48).



**Figure 14:** PHQ-9 item responses at 12 months (n=48). Data are presented as n.

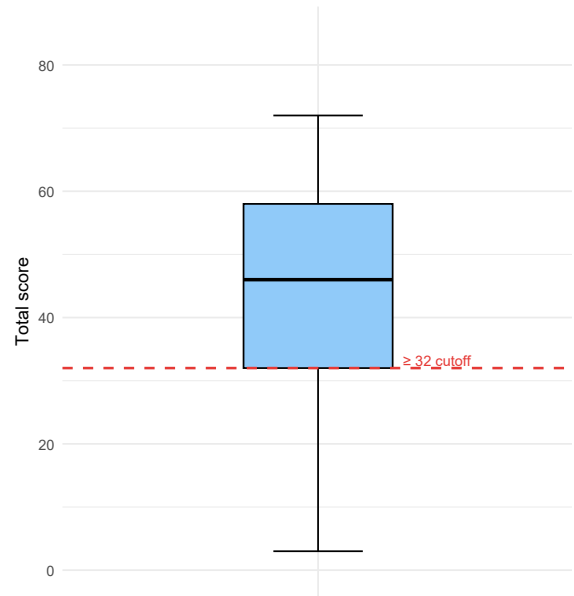


## Échelle PCL-5 (checklist du TSPT pour le DSM-5)

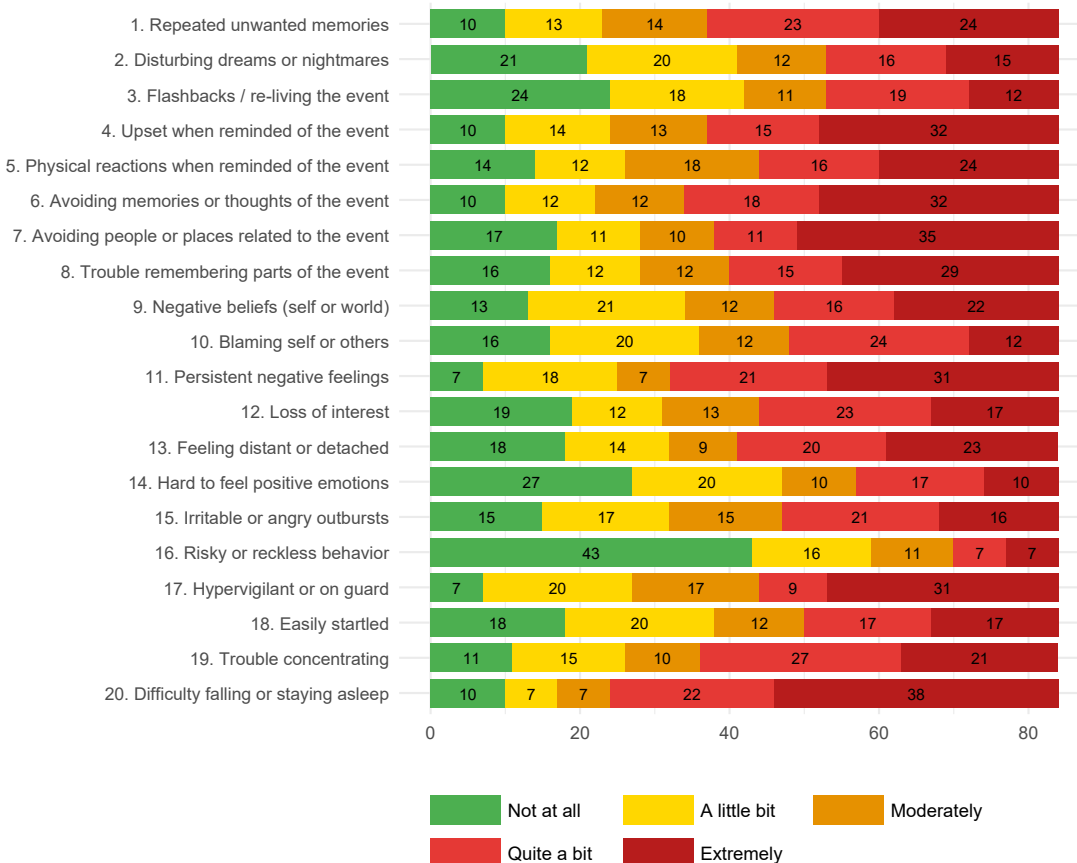
Lors du suivi à 3 mois (n = 84), 63 patient-es (75 %) présentaient un score de TSPT cliniquement significatif ( $\geq 32$ ), et 61 (73 %) remplissaient les critères diagnostiques provisoires de TSPT selon le DSM-5.

Les symptômes les plus fréquents étaient les troubles du sommeil (80 %), le rejet des pensées liées au traumatisme (74 %), les souvenirs intrusifs non désirés (73 %), la détresse lors des rappels du traumatisme (71 %), les émotions négatives (70 %), les réactions physiques face aux rappels (69 %) et les difficultés de concentration (69 %). L'hypervigilance (68 %) et l'évitement de certaines personnes ou certains lieux (67 %) étaient également fréquents. En considérant les groupes de symptômes du DSM-5, les symptômes d'intrusion étaient rapportés par 62 patient-es (74 %), d'évitement par 52 (62 %), d'altérations négatives des cognitions et de l'humeur par 62 (74 %) et d'hyperactivation par 62 (74 %).

**Figure 15:** PCL-5 total score categories at 3 months (n=84).



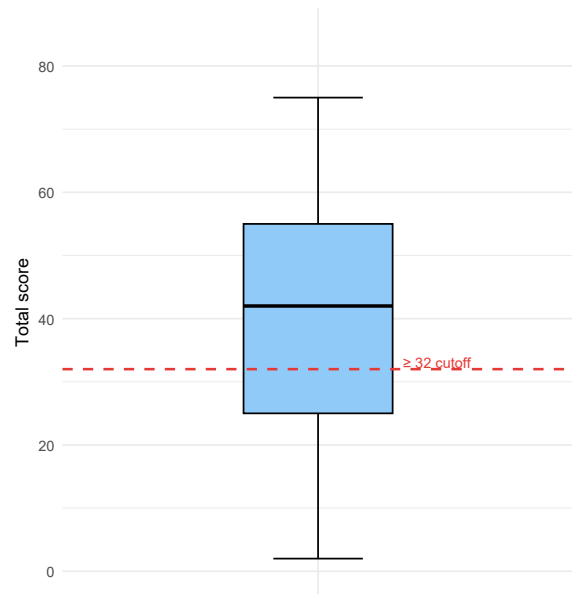
**Figure 16:** PCL-5 item responses at 3 months (n=84). Data are presented as n.



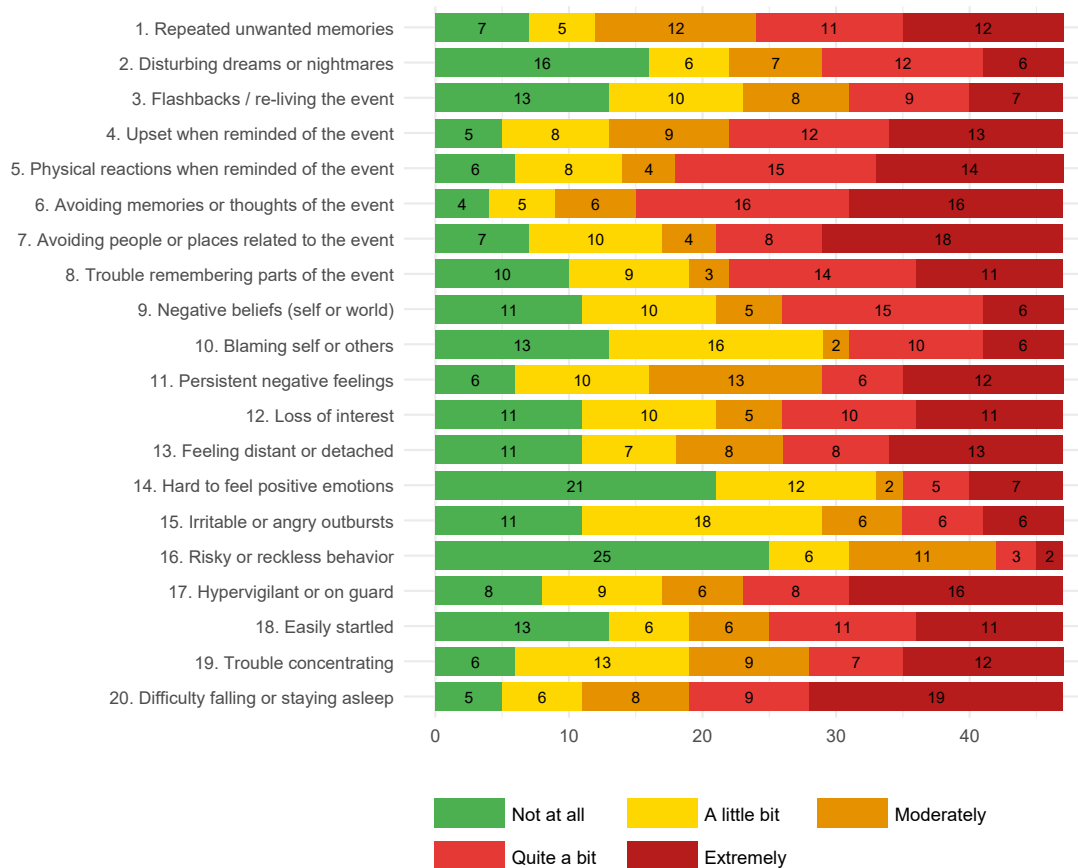
At the 12-month follow-up (n = 47), 32 patients (68%) continued to have clinically significant PTSD scores ( $\geq 32$ ), and 29 patients (62%) met the provisional DSM-5 PTSD diagnostic criteria.

The most frequent symptoms remained sleep disturbance (72%), intrusive memories (66%), distress at reminders (64%), negative emotions (62%), and hypervigilance (60%). Concentration problems (58%) and physical reactivity to reminders (55%) were also prominent. Cluster-level results showed that intrusion symptoms were reported by 68%, avoidance by 55%, negative alterations in cognition and mood by 64%, and hyperarousal by 66%.

**Figure 17:** PCL-5 total score categories at 12 months (n=47).



**Figure 18:** PCL-5 item responses at 12 months (n=47). Data are presented as n.

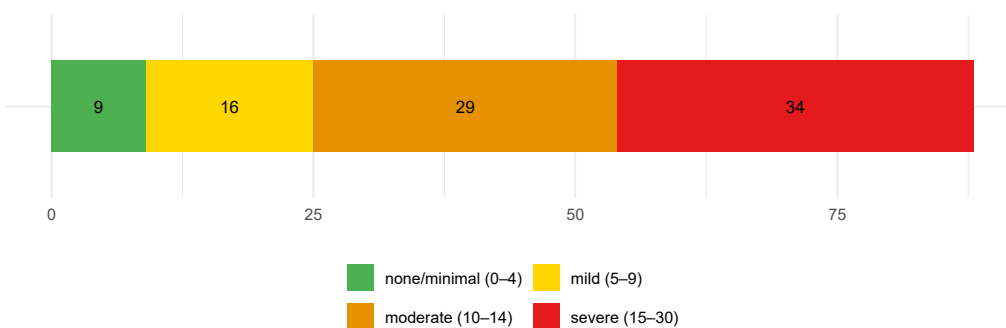


## PHQ-15 – Physical Symptoms

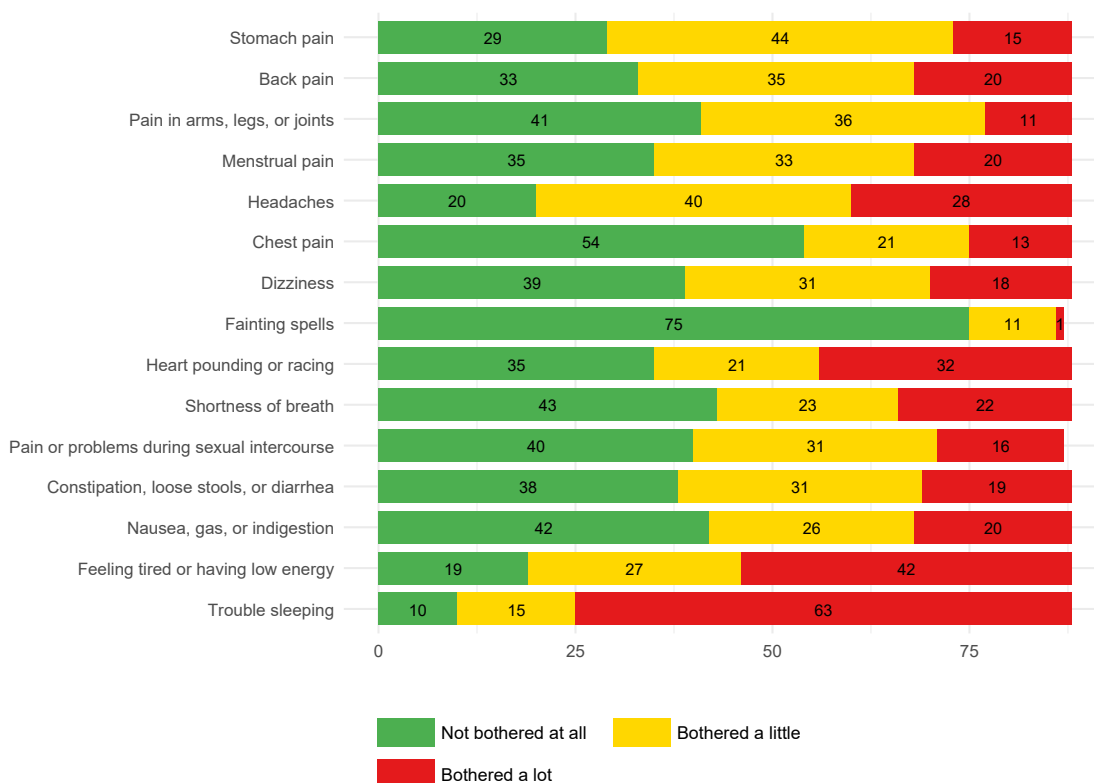
At the 3-month follow-up (n = 88), 72% of patients presented with moderate to severe somatic symptoms (PHQ-15  $\geq$  10), including 29 (33%) with moderate symptoms and 34 (39%) with severe symptoms. The most frequently reported symptoms were sleep difficulties (72%), fatigue or lack of energy (48%),

heart palpitations (36%), headaches (32%), and shortness of breath (25%). Other symptoms such as back pain, menstrual problems, dizziness, and gastrointestinal complaints were also common, though less often described as very severe.

**Figure 19:** PHQ-15: total score categories at 3 months (n=88).



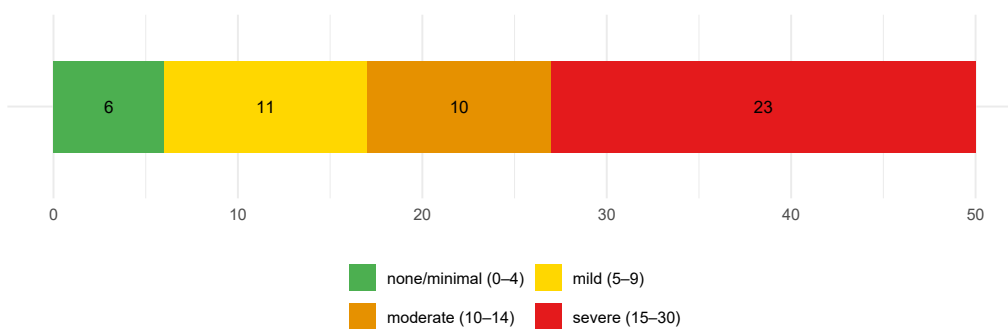
**Figure 20:** PHQ-15 item responses at 3 months (n=88). Data are presented as n.



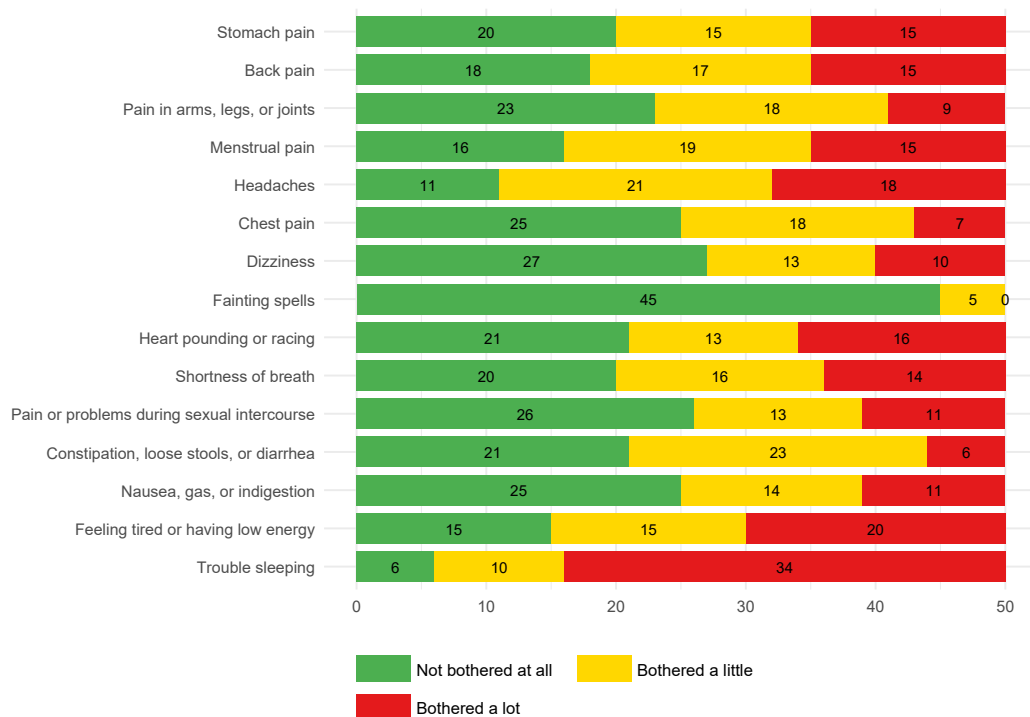
At the 12-month follow-up (n = 50), somatic symptoms persisted in a majority of patients, though their frequency was slightly reduced compared with the earlier evaluation. The most prominent symptoms

remained sleep problems (68%) and fatigue or low energy (40%), followed by headaches (36%), heart palpitations (32%), and back, stomach, or menstrual pain (30% each).

**Figure 21:** PHQ-15 total score categories at 12 months (n=50).



**Figure 22:** PHQ-15: item responses at 12 months (n=50). Data are presented as n.



### **Female Sexual Function Index (FSFI)**

At the 3-month follow-up (n = 82), 20 patients (24%) reported no sexual activity, and 6 had incomplete data. Analysis was therefore based on 56 participants. Among these, 48 patients (86%) had scores consistent with sexual dysfunction (FSFI total score  $\leq$  26.55). The domains most affected were orgasm, arousal, and desire, while pain and satisfaction were comparatively less affected.

At the 12-month follow-up (n = 44), 11 patients (25%) reported no sexual activity and 3 had incomplete data. The analysis was therefore based on 30 participants, of whom 19 (63%) presented with sexual dysfunction. As at three months, the most impacted domains were orgasm, arousal, and desire, while pain and satisfaction were less affected.

### **Summary of 3- and 12-month follow-up**

At the 3-month follow-up, patients reported high levels of symptoms across all domains. Moderate to severe anxiety was present in 67%, depression in 82%, and probable PTSD in 75% of participants. Among those who were sexually active, 86% reported sexual dysfunction, and over 70% experienced significant somatic symptoms, most commonly fatigue and sleep disturbance. Substance use and related consequences were also reported.

At the 12-month follow-up, prevalence rates were slightly reduced across most measures, though symptoms remained frequent. Clinically significant anxiety was observed in 57%, depression in 71%, and probable PTSD in 68% of participants. Sexual dysfunction persisted in 63% of sexually active patients, and somatic symptoms such as sleep problems, fatigue, and headaches continued to affect more than half of participants. These results indicate the persistence of mental, sexual, and physical health consequences up to one year after sexual assault.

# Discussion

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## Continuity with retrospective study findings

The present study builds directly on the retrospective analysis of sexual assault reports conducted at the Geneva and Lausanne University Hospitals between 2018 and 2021. Overall, the demographic and contextual characteristics of the assaults remained comparable across the two studies. As in the retrospective phase, most patients reported knowing the perpetrator, most often a friend, acquaintance, or intimate partner, and most assaults occurred in private settings rather than public spaces. The delay between the assault and the emergency consultation also showed a similar pattern, with most patients presenting within 72 hours. A modest increase in early consultations may reflect the decentralization of medico-legal services since 2020 and the extension of sexual assault examination sites to regional hospitals in the cantons of Vaud and Valais, improving accessibility to care.

The prevalence and anatomical distribution of body and genito-anal injuries were also consistent with the previous findings, confirming the stability and reliability of the standardized medico-legal protocol used across all participating sites. These similarities strengthen the comparability of data between the retrospective and prospective phases and support the ongoing use of harmonized documentation across participating sites.

The main added value of the prospective study lies in its longitudinal design, which limits missing information and allows for systematic follow-up at 3 and 12 months after the assault. This follow-up enables the assessment of patients' medium- and long-term mental, physical, and sexual health outcomes through the use of standardized psychometric tools (GAD-7, PHQ-9, PCL-5, PHQ-15, FSFI, and WHO-ASSIST). The inclusion of patient-reported experiences further provides valuable insight into care trajectories and satisfaction with emergency and follow-up services.

Beyond confirming the findings of the retrospective study, this prospective phase represents the first multicenter initiative in Switzerland to systematically document both the acute and evolving consequences of sexual assault. It thus offers a unique opportunity to identify persistent vulnerabilities, inform trauma-informed care pathways, and guide the future development of the regional sexual assault registry in Switzerland.

## Mental Health Outcomes

High levels of anxiety, depression, and post-traumatic stress symptoms were observed among persons exposed to sexual violence up to twelve months after the assault. At three months, 67% of participants presented with clinically significant anxiety (GAD-7  $\geq 10$ ), 82% with depressive symptoms (PHQ-9  $\geq 10$ ), and 75% met the threshold for probable PTSD (PCL-5  $\geq 32$ ). Although symptom prevalence declined modestly by twelve months—57%, 71%, and 68%, respectively—these figures indicate sustained psychological distress long after the acute phase.

When compared with international data, the burden observed in this cohort appears even greater than typically reported. A meta-analysis by Dworkin et al. found that 30–60% of people exposed to sexual violence develop PTSD within the first year following assault<sup>[10]</sup>, while large-scale epidemiologic studies describe similar or lower rates of depression and anxiety<sup>[11]</sup>. The proportion of participants in this study meeting probable PTSD criteria at both three and twelve months substantially exceeds most previously documented ranges. This heightened burden may reflect differences in sample composition, care-seeking behavior, or contextual factors specific to the Swiss healthcare and sociocultural environment. For instance, 61% reported having experienced a previous sexual assault, and prior victimization has been consistently associated with both increased vulnerability to revictimization and poorer mental health outcomes, including higher rates of post-traumatic stress and depressive symptoms.<sup>[12-14]</sup>

The ecological framework proposed by Campbell et al. highlights how the interaction of individual vulnerability, social context, and systemic responses influences recovery trajectories after sexual assault.<sup>[15]</sup> Depressive symptoms were similarly prevalent, with approximately one-third of patients reporting severe depression at both follow-up points. Earlier research has shown comparable patterns of sustained depressive and anxiety symptoms years after the event.<sup>[16,17]</sup> The high frequency of suicidal thoughts—reported by 45% at three months and 52% at twelve months—further illustrates the depth and persistence of post-assault emotional suffering described in the broader literature.

In Geneva, patients are systematically referred to the Interdisciplinary Unit of Medicine and Prevention of Violence (UIMPV) for psychological follow-up within days of their emergency consultation, whereas in other participating sites, psychotraumatic follow-up is not yet systematically integrated into post-assault care. This difference in mental health support structures may influence recovery trajectories and could partially explain variations in symptom persistence observed between regions. The prospective design of this study allows for the future analyses to explore the relationship between access to specialized follow-up and long-term mental health outcomes.

Overall, these findings corroborate international evidence that recovery from sexual assault is often prolonged and incomplete, with symptoms of PTSD, depression, and anxiety persisting in a large proportion of individuals who experienced sexual assault, long after the initial crisis period.<sup>[10,11,15]</sup>

## Sexual health outcomes

Sexual functioning was markedly impaired after the assault and showed only partial improvement by twelve months. Among sexually active respondents, 86% met the FSFI threshold for sexual dysfunction at three months and 63% at twelve months—rates considerably higher than those observed in general population studies, where between 40% and 50% of women report some degree of sexual dysfunction.<sup>[18,19]</sup> The domains most affected in this cohort—orgasm, arousal, and desire—mirror findings from prior studies describing long-lasting alterations in sexual response and intimacy following sexual assault or abuse.<sup>[20,21]</sup>

The persistence of dysfunction over one year underscores the profound and enduring impact of sexual violence on psychosexual well-being. Research indicates that trauma-related anxiety, hypervigilance, and intrusive recollections can disrupt physiological arousal and contribute to avoidance of sexual activity.<sup>[22,23]</sup> Individuals who experienced sexual assault often experience a complex interplay of psychological distress, relational difficulties, and bodily discomfort, leading to diminished sexual desire and satisfaction.

Comparable results have been documented in clinical and population-based samples, where people who experienced sexual assault report persistent dysfunction even years after the event.<sup>[18,21]</sup> Moreover, research has linked sexual violence with higher rates of vulvodynia, chronic pelvic pain, anorectal and genitourinary dysfunction<sup>[24,25]</sup>, suggesting that physical and psychological sequelae may overlap to influence both sexual and gynecologic health. Together, these findings point to the multifactorial nature of sexual health consequences following assault and the need for continued investigation into their biopsychosocial pathways to improve care and information.

## Somatic symptoms

Somatic symptoms were frequent and persistent across follow-up. At three months, nearly three-quarters of patients reported at least one physical symptom rated as very bothersome, most often sleep disturbance, fatigue, heart palpitations, and headaches. Although these complaints decreased modestly by twelve months, more than half of participants continued to experience physical symptoms, highlighting the durability of somatic distress after sexual assault.

These findings are consistent with research linking sexual violence to a broad range of physical health consequences. Survivors of sexual assault frequently report higher rates of chronic pain, gastrointestinal problems, fatigue, and other medically unexplained physical symptoms compared with non-exposed women.<sup>[26-29]</sup> Such manifestations are thought to arise from the lasting effects of trauma on the body's stress and pain regulation systems, which can heighten sensitivity to physical discomfort and contribute to long-term health problems.<sup>[30]</sup>

In addition to these general somatic symptoms, trauma-related gynecologic conditions have been reported in multiple studies. Survivors show increased risks of chronic pelvic and vulvar pain, and genitourinary dysfunction compared with controls.<sup>[21,24,25]</sup> These conditions may reflect the same continuum of physical and psychological sequelae seen in other forms of somatic distress.

## Substance use patterns

Substance use was frequent in the study population and remained relatively stable over time. Based on WHO-ASSIST scores, more than one-third of participants at the 3-month follow-up reported moderate or high-risk use for at least one psychoactive substance. The substances most frequently reported were alcohol, tobacco, and cannabis, followed by prescription sedatives. Craving, defined as a strong or irresistible urge to use, was reported by approximately three-quarters of tobacco users, two-fifths of alcohol users, and one-quarter of cannabis users. Around one-third of respondents described some form of concern or difficulty related to their use, such as impaired functioning or unsuccessful attempts to reduce consumption. At 12 months, the distribution of WHO-ASSIST

scores was similar, with persistent moderate- to high-risk use across the main substances. Although some individual variation was observed, there was no overall reduction in prevalence between the two time points. These findings suggest that for many participants, substance use behaviors remain stable during the first year following the assault.

This pattern aligns with previous studies showing that alcohol and other substance use are common among sexual assault survivors, often co-occurring with symptoms of anxiety, depression, and post-traumatic stress.<sup>[10,31,32]</sup> While the mechanisms linking trauma exposure and substance use remain complex and multifactorial, prior longitudinal research has documented that survivors may exhibit persistent or fluctuating patterns of consumption over time.<sup>[33,34]</sup> Consistent with these findings, our results highlight the need to consider substance use as part of the broader health profile of individuals presenting for sexual assault care.

## Timing and pathways of consultation

The majority of patients presented for medico-legal consultation within the first 72 hours following the sexual assault, a critical window for both forensic and clinical interventions. In this study, 81% of participants were examined within three days of the assault, including 45% within 24 hours, 21% between 24 and 48 hours, and 15% between 48 and 72 hours. A smaller proportion presented later, with 5% between 72 hours and 4 days, 8% between 4 and 7 days, 5% between one week and one month, and 1% after more than one month.

This distribution closely mirrors data from other European and North American hospital-based studies, which report that 70–85% of survivors seek care within 72 hours.<sup>[25,36]</sup> The early presentation observed in this cohort is consistent with the increased availability of emergency sexual assault services and greater awareness of the importance of prompt consultation. However, the persistence of delayed presentations—beyond the optimal forensic window—remains a challenge, as these cases often coincide with amnesia or uncertainty about the event, potentially complicating both medical and legal evaluation.<sup>[32,37]</sup>

The progressive expansion of the medico-legal care system following sexual assault in French-speaking Switzerland has improved accessibility, particularly through the extension of the CURML network and the inclusion of regional hospitals in the canton of Vaud. These structural developments appear to have reduced geographical barriers to care and may partially explain the high proportion of timely consultations observed in the present cohort.

### Violence and injuries

Almost half of the patients reported physical violence during the assault, most often being restrained, pushed, or hit. Psychological violence was also frequent, mainly through threats, intimidation, or humiliation. These results are similar to those reported in other hospital-based studies in Europe, where coercion and intimidation were among the most common forms of aggression.<sup>[35,36]</sup> Together, they underline that sexual assault often occurs in a context of both physical and psychological coercion rather than isolated sexual acts.

Injuries were documented in most sexual assault cases (87%), with upper and lower limb lesions being the most frequent, followed by injuries to the back, buttocks, and head or face. This pattern corresponds to what has been described in other forensic studies, where injuries are often located on the extremities and trunk.<sup>[38,39]</sup> Genito-anal injuries were observed in 29% of the examined patients, including 26% with genital injuries and 5% with anal injuries. Vulvar injuries were the most frequent, followed by hymenal, perineal, and vaginal lesions. These proportions are comparable to those reported in large European series.<sup>[35,36]</sup> As highlighted in earlier studies, the absence of visible lesions does not exclude sexual assault, since many confirmed cases show no detectable lesions.<sup>[38,40]</sup> Overall, the distribution and frequency of physical and genital injuries observed here are consistent with the published literature. The findings confirm that while forensic injury documentation is an important part of the medical evaluation, it should always be interpreted together with the patient's history and the context of the assault.

### Medico-legal and prevention implications

In our cohort, only about one quarter of sexual assault examinations were ordered by the police or the public prosecutor, while the majority of patients presented voluntarily to the emergency department. This pattern highlights the crucial role of hospital-based services as an initial point of contact for survivors, independent of judicial pathways. Similar distributions have been observed in European and North American studies, where most survivors choose to seek medical care rather than initiate legal procedures immediately after the assault.<sup>[41,42]</sup>

Multiple factors likely contribute to this tendency. Previous research has documented that survivors often fear not being believed, have concerns about confidentiality, and experience the emotional strain of recounting the assault in judicial settings.<sup>[43,44]</sup> Such apprehensions may discourage formal complaint filing even when medical and forensic care is sought promptly. These considerations underline the need for medico-legal systems that prioritize the survivor's autonomy and health, ensuring that clinical care and forensic documentation can occur regardless of whether a legal complaint is filed.

The development of a standardized, prospective registry for sexual assault cases—as implemented in this study—represents a significant advance in integrating clinical, forensic, and public health perspectives. Beyond its medico-legal value, such a registry provides essential epidemiological and clinical data to strengthen prevention, improve short- and long-term care, promote intersectoral collaboration between the health, social, and justice systems, and support the development of targeted training, awareness campaigns, and care pathways.

## Limitations

Several limitations must be considered when interpreting these findings. First, among the 454 patients meeting the inclusion criteria, 178 (39%) agreed to participate in the study. As commonly observed in longitudinal studies involving sexual assault survivors, participation decreased over the course of the follow-up, with 85 participants at 3 months (48% of the initial participants) and 49 at 12 months (28%). This loss to follow-up resulted in smaller samples at follow-up and introduces the potential for non-response bias. Participants who remained in the study may differ from those who discontinued in terms of resilience, access to care, or symptom severity.

Second, while all instruments used (GAD-7, PHQ-9, PCL-5, PHQ-15, FSFI, WHO-ASSIST) are validated screening tools, they rely on self-reported data and are therefore subject to recall bias and response subjectivity.

Third, the study population was limited to individuals presenting to hospital emergency departments, which may not reflect all survivors—particularly those who do not seek medical or forensic care, or who consult community services instead.

Fourth, although the standardized medico-legal protocol across participating hospitals strengthens comparability, minor variations in documentation, examiner experience, or timing of the exam and differences in follow up could influence findings such as injury detection rates.

Finally, due to the observational design, causal inferences cannot be made regarding the relationships between assault characteristics, treatment, and long-term outcomes. Despite these limitations, the multicentric and prospective design of this study provides a robust and rare dataset on the short- and long-term physical, psychological, and sexual health consequences of sexual assault in Switzerland.

## Strengths

This study also presents several notable strengths. It is the first multicentric, prospective cohort in Switzerland to systematically evaluate the medico-legal, physical, psychological, and sexual health outcomes of individuals consulting for sexual assault. The inclusion of multiple hospitals across three cantons—each applying a standardized medico-legal protocol—enhances both the representativeness and comparability of findings.

Second, the integration of clinical, forensic, and self-reported data allows for a uniquely comprehensive assessment of survivors' health trajectories, bridging gaps between emergency care, mental health, and sexual health outcomes. The addition of 3- and 12-month follow-up questionnaires constitutes a major advancement compared with the previous retrospective phase, enabling longitudinal monitoring of recovery and persistent symptoms.

Finally, the creation of an electronic and harmonized registry represents a sustainable platform for ongoing surveillance, research, and quality improvement in post-assault care. This infrastructure lays the groundwork for future national collaborations and supports the broader public health goal of strengthening prevention, education, and response systems for people affected by sexual assault in Switzerland.

## Conclusion and recommendations

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This prospective multicentric study represents a major advance in documenting the acute and long-term health consequences of sexual assault in Switzerland. By integrating standardized medico-legal documentation, longitudinal follow-up, and validated psychometric tools, it provides unprecedented insight into the physical, psychological, and sexual health trajectories of survivors up to one-year post-assault. The persistence of anxiety, depression, post-traumatic stress, sexual dysfunction, and somatic symptoms highlights the need for sustained, coordinated, and trauma-informed responses beyond the initial emergency consultation.

Building on these findings, several priority areas for intervention and development have been identified. First, improving information for patients is essential. Survivors should receive clear, accessible information on where to seek care, the importance of follow-up, and the potential physical and psychological health impacts of sexual assault, including available mental health support. Second, training for emergency healthcare professionals must be strengthened. The implementation of e-learning modules and simulation-based training—already underway at some sites, for example in Geneva—will be expanded and formally evaluated to ensure consistent, compassionate, and evidence-based responses across all participating centers.

Third, the creation of a standardized, multicenter registry for sexual assault cases within emergency services will enable systematic monitoring, research, and evaluation of interventions across cantons. This registry will serve as a cornerstone for future prevention efforts, quality improvement, and policy development at the cantonal and national levels. The upcoming inclusion of Ticino (launch meeting held in October 2025) marks an important step toward a truly national platform.

Finally, the results underscore the need for standardized mental health support pathways. While Geneva benefits from the structured follow-up provided by the Interdisciplinary Unit of Medicine and Prevention of Violence (UIMPV), equivalent mechanisms are not consistently available elsewhere. Future work will explore models of psychological care coordination, such as the involvement of a psychiatric nurse or patient manager to provide follow-up calls, accompany survivors to key appointments, and ensure continuity of care over time.

Together, these actions aim to translate research into practice by improving patient information, professional training, and interinstitutional coordination. They will form the basis of upcoming funding requests to strengthen the prevention, care, and monitoring of sexual assault across Switzerland.

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### **Data Sharing**

The deidentified data (including data dictionary) from this study, the analytical code used, the study protocol, along with data from the prospective study, will be shared in an open data repository.

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