***Psychosocial Vulnerability among Patients contacting a Norwegian Sexual Assault Center***

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**Abstract**

In this study the objective was to assess the occurrence of specific vulnerability factors among adult and adolescent females attending a Norwegian sexual assault center (SAC). We also explored assault characteristics and investigated whether these characteristics differed between the group of patients with vulnerability factors compared with the group without such factors. We conducted aretrospective descriptive study of women ≥ 12 years of age attending the SAC at St. Olavs Hospital, Trondheim, Norway, between July 1, 2003 and December 31, 2010. 573 patients were included and information was extracted from medical records. A patient was considered vulnerable if at least one of the following features was present: intellectual or physical disability; history of present / former mental health problems; history of present / former alcohol /substance abuse or former sexual assault. Chi-square, Kruskal-Wallis, and logistic regression analyzes were used in the comparisons. At least one vulnerability factor was present in 59% of the cases: 9% had intellectual or physical disability; 41% had a history of present or former mental health problems; 9 % had present or former alcohol / substance abuse; while in 35% of the cases patients reported one or more prior sexual assaults. More than one vulnerability factor was present in 29%. Reporting at least one vulnerability factor was associated with a higher patient age, unemployment, a higher frequency of reported light/moderate physical violence and the documentation of minor body injury. In contrast, those without vulnerability more often were students, assaulted during night time, by a casual or stranger assailant and reporting a higher intake of alcohol prior to the assault. There are obvious patterns of differences in the nature of sexual assaults reported among victims with specific vulnerability factors compared with victims without these factors. Future research should address possible solutions for better protection of especially vulnerable individuals against sexual offences, such as regarding mental health and substance abuse.

**Keywords** Sexual assault, vulnerability factors, assault characteristics

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From 1989 the sexual assault center (SAC) at St. Olavs University Hospital in Trondheim, Norway, has offered medical assistance and forensic examination to sexually assaulted victims. The patients receive emergency medical and forensic care, including treatment and documentation of injuries, collection of biological trace evidence, laboratory testing and psychosocial crisis intervention (Hagemann et al., 2013; Stene, Ormstad, & Schei, 2010). During the observation period of this study (2003-2010) the SAC has received approximately 100 patients each year. Different studies report that only a minority of sexual assault victims report the incidents to health care and/or police (*Fra ord til handling*, 2008; Jones, Alexander, Wynn, Rossman, & Dunnuck, 2007; Nesvold, Friis, & Ormstad, 2008). There are reasons to believe that even lower rates of hospital and/or police reporting of sexual assaults exist among especially vulnerable individuals (Aylott, 1999; Jones et al., 2007).

In earlier studies from our SAC, we have introduced the concept of “vulnerability factors” (Hagemann et al., 2013; Stene et al., 2010). A victim was considered vulnerable if at least one of the following features was present: Intellectual and/or physical disabilities; history of present/former mental health problems; history of present/former alcohol/substance abuse (later referred to as substance abuse); and former sexual assault. According to WHO, at least some of these factors are defined as risk factors that increase women’s vulnerability for sexual assault (World Health Organization, 2002), and previous research from other settings has examined different aspects of the mentioned vulnerability factors.

According to population data people with intellectual disability have an increased propensity for being victims of sexual abuse compared to people without such disability (Aylott, 1999) Evidence-based knowledge is limited regarding sexual offences towards people with disabilities, and most studies describe patients with any disability, without discriminating between physical and intellectual disabilities. Prevalence measures for intellectual disability are quite diverging in the literature, varying from 0.2 % to 8.5 %, according to a population study (Söndenaa, Nöttestad, & Björgen, 2007). Only a few SACs have published information about the prevalence of any disabilities, and almost none have specifically explored assault characteristics of SAC patients with disabilities. Only 3 % in a Norwegian SAC-study had a mental disability (Nesvold et al., 2008). In a Canadian SAC-study 11 % was reported to have physical or cognitive disabilities (Du Mont et al., 2009). A French SAC-study found that 7 % of the victims were either physically or mentally handicapped (Saint-Martin, Bouyssy, & O'Byrne, 2007).

 A SAC-study from the UK was dedicated to the psychological profiles of adult sexual assault victims to investigate the influence of mental health on the patients` susceptibility to sexual assaults (Creighton & Jones, 2012). Two thirds of a sample of 269 adults demonstrated psychiatric illness. Affective disorders were highly prevalent, disclosed in 49 % of the cases (depression, anxiety and depression, bipolar affective disorder). Only 3 % had a diagnosis of psychotic illness. Deliberate self-harm was disclosed in 29 % and as many as 22 % reported attempted suicide at least once in their lifetime. Parallel to this, in another study from a SAC in the US 27 % of the victims had a registered psychiatric diagnosis (Ackerman, Sugar, Fine, & Eckert, 2006).

One SAC-study refers that 40 % of female victims of sexual assault seeking post-assault medical care reported a prior substance abuse history. The occurrences of different forms of substance abuse were further subdivided and the study concluded that assessment and intervention approaches should target alcohol, marihuana and other illicit drug abuse (Resnick, Walsh, Schumacher, Kilpatrick, & Acierno, 2013). Another study described that 17 % of the patients attending a SAC at the end of the 90s reported an addiction problem (Nesvold et al., 2008)

A Canadian review article found that people who have experienced sexual assaults in childhood have twice the risk of being sexually assaulted in their adolescence and young adult life, compared with people people who have not experienced such assaults in childhood. Further, two of three individuals who are sexually victimized, either in childhood or as adults, will be revictimized (Classen, Palesh, & Aggarwal, 2005). Earlier studies from SACs report, correspondingly, high occurrences of this vulnerability factor (Haugen, Slungård, & Schei, 2005; Möller, Backström, Söndergaard, & Helström, 2012; Nesvold et al., 2008; Resnick et al., 2013; Rust, 2008).

Searching the SAC literature for studies which compare assault characteristics between vulnerable and non-vulnerable women, gives only a limited amount of hits. There are also lacks of reports describing multiple vulnerability factors as a pooled phenomenon among patients attending health care after sexual assault.

**Primary aim of the study:** To describe the occurrences of four specific vulnerability factors among adult and adolescent female patients seeking health care after sexual assault, and to investigate whether there were different patterns of sexual assaults committed against the group of patients with vulnerability factors compared with assaults against the group without these factors. Secondary aim was briefly to describe the assault characteristics for each separate vulnerability factor, in addition to describing those with more than one vulnerability factor.

**Our main hypothesis** was that the sexual assault characteristics are uniquely different between the two groups; patients with vulnerability factors and patients without vulnerability factors. Age of patient and assailant, relationship between the patient and the assailant, and bodily injury were some of the main independent variables used in the comparisons.

**Material and Method**

*Settings*

St. Olavs Hospital is a University Hospital in the city of Trondheim, Norway. The hospital`s catchment area is the SouthTröndelag county in central Norway, which has a population of approximately 280 000 inhabitants, including the city of Trondheim, with about 160 000 inhabitants.

*Participants*

The study examines female patients ≥ 12 years of age who visited the SAC at St. Olavs Hospital, between July 1, 2003 and December 31, 2010. Based on extraction of data from medical records sociodemographic information was gathered, which included the patients` age and their occupational status (employed/unemployed/student) and psychosocial history. The latter includes the four vulnerability factors for sexual assault as described in the introduction.

In all 730 patients attended the SAC during the period. Males (n=20), and those not medically examined (n=68) were first excluded. All patients eligible for inclusion (n=623, involved in a total of 667 visits) received a letter of information about the study, with instructions on how to actively withdraw their records from the study. Those not wanting their medical records used, were excluded (n=9). Additionally, some of the patients (21) had been brought to the SAC by others but found that it was unlikely that a sexual assault had happened (n=21). For those who did not remember, this judgement was based on criteria stated in a Canadian study (Du Mont et al., 2009).

According to these inclusion and exclusion criteria, 612 individual hospital consultations regarding recent sexual assault were documented. Only the first visit for each individual patient was used, resulting in a study group of 573 patients (Figure 1).

**Figure 1. Flow chart for patients includable for study. Cases based on patients attending the Trondheim Sexual Assault Centre during the period July 2003 through 2010.**

*Materials, variables and procedure*

The study has a retrospective, descriptive design, based on information gathered from the patients` medical records and registered through a web-based data collection system developed and administered by the Unit of Applied Clinical Research at the Norwegian University of Science and Technology. Medical records included both the clinical documentation and the standardized forensic record (the latter occasionally requested by the police for investigational use). To ensure accuracy, the different collectors of data cross-checked with the records. Any discrepancies were addressed and consensus was reached in collaboration with the co-authors. A majority of the included patients had been examined by a specialist or a resident in obstetrics and gynecology, specially trained in forensic examination after sexual assault, but some of the examinations were done by trained nurses.

The variables in this study are based on earlier publications, and have been extracted from the existing list of variables formerly used in the collection of data from the SAC at St. Olavs Hospital. The four vulnerability factors were chosen because we regard these as being crucial. They describe especially pervasive and inherent qualities of the victims, in a long-term perspective, rather than other risk factors like acute intoxication at the time of assault or suspected drug facilitated sexual assault, which are rather situational factors more directly linked to the time of assault. For this study, the vulnerability factor concerning disabilities consists of intellectual disability and/or physical disability. Ideally, analyzes could have been done with the two disability groups differenciated. Due to insufficient sample size and limitations regarding detailed information of the disability in each case we chose to merge both groups into one compound variable. In this study, like in an earlier study from the Trondheim SAC (Hagemann et al., 2013) mental health problems were defined as the diagnoses of affective disorders, psychotic illness, eating disorders, deliberate self-harm or attempted suicide. It also included the use of antidepressant or antipsychotic medication and a history of use of mental health services. The patients were registered as having the vulnerability factors history of current/former alcohol/substance abuse, or previous sexual assault based on self-reporting. Most of the descriptive variables listed in table 2 (left column) are also based on self-reporting by the patient or her companion, except patient age and bodily injury. Alcohol intake prior to the assault was categorized as no intake, intake of < 5 units of alcohol, and intake of ≥ 5 units. One alcohol unit was defined as corresponding to 12 g ethanol, which equals approximately one standard-sized glass of alcoholic beverage. This variable is regarded as situational and describes the (voluntary) alcohol intake prior to a sexual assault and should not be confused with one of the vulnerability factors chosen as the outcome variable of this study, alcohol/substance abuse, which refers to a former or present clinical condition of alcohol or substance addiction.

Assailant age (reported by the patient) was recorded. The relationship between woman and assailant was defined as partner (current or previous partner/husband/boyfriend), family member or friend, casual contact (assailant known < 24 hours) or stranger (assailant not previously known). Time of day of the assault was dichotomized to 7 a.m. to midnight (daytime/evening) or midnight to 7 a.m. (usual sleeping time). Place of assault defined as private included the patient`s, assailant`s or other person`s home. Public place included any public indoor or outdoor location. Physical violence was graded as severe (presence of weapon/attempted strangulation/fracture or internal injuries), light/moderate (holding/punch/kick) or none/verbal threats. If more than one category of violence was described, the answers were stated according to the above-mentioned order. The sexual act was categorized into no penile penetration, penile vaginal, anal, or oral penetration in one orifice only, and penile penetration in more than one orifice. The sexual act was classified as ”no recollection” if the incident had occurred while the woman was asleep, inebriated or unconscious. Somatic investigation included bodily and anogenital injuries. Location, type and number of injuries were recorded. Bodily injuries were classified as serious when evidence of attempted strangulation, head injury with concussion and stab/incision wounds were present, moderate when bruising of the head and neck could be expected to result in significant headache, lacerations requiring suture/dressing, bite marks and/or injection marks were present, and minor when erythema, swelling, bruises, abrasions, lacerations and/or suction marks were present. This classification of bodily injuries is based on a previous Canadian study (McGregor, Du Mont, & Myhr, 2002). The event was registered as police-reported if the patient said so or if the police requested a medico-legal report for investigational use.

*Statistical analysis*

The data were analyzed using the SPSS (Statistical Package for the Social Sciences, version 21). We compared patients and assailants mean age, respectively, between those with and without vulnerability by using the Student`s t-test. Chi-square tests were used to explore our main hypothesis (differences in the categorical assault characteristics between vulnerable and non-vulnerable patients). For the comparisons of the vulnerability group vs. those without vulnerability we also used logistic regression analyzes, calculating crude and adjusted odd ratios (ORs) with corresponding 95% confidence intervals (CIs). We adjusted for age and intake of alcohol (both as a 3-categorical variable) and entered the variables into the logistic regression models without stepwise selection. When comparing assault characteristics between non-vulnerable patients and patients in each separate vulnerability factor group, according to our secondary aim, we almost exclusively used chi-square tests, except on two occasions where sample size were insufficient for using the chi-square: When comparing women with and without disabilities regarding relationship to the assailant and when comparing women with and without substance abuse, regarding bodily injury. We then got valid results by running a Kruskal-Wallis test. Statistical significance was assumed when *p* < 0.05.

**Results**

Most of the women were young (with mean age 23, range 12-61 years). Many (59 %) had at least one of the four vulnerability factors present: 54 patients (9%) had intellectual and/or physical disability (30 patients with intellectual disability, 22 patients with physical disability and two patients with both intellectual and physical disability); 234 patients (41 %) reported to have a mental health problem; 51 patients (9 %) had present or former alcohol or drug abuse; and 200 patients (35 %) reported one or more prior incidents of sexual assault. Many had more than one of the vulnerability factors present. Table 1 gives an overview of the number of vulnerability factors present among the patients. None of the patients reported all four vulnerability factors. Regarding sexual acts 12 % of the patients reported no penetration.

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| **Table 1. Vulnerability factor score among 573 female victims attending the Trondheim Sexual Assault Centre between July 2003 and December 2010** |
| **Number of vulnerability factors**  | **Frequency** | **Percent** |
| 0 | 238 | 41% |
| 1 | 171 | 30% |
| 2 | 124 | 22% |
| 3 | 40 | 7% |

*Vulnerability vs. not*

Table 2 presents assault- and assailant-related characteristics of vulnerable vs. non-vulnerable patients, and contains our key findings in relation to confirming our main hypothesis. The patients’ mean age was 24 years in the vulnerability group and 21 years among those without vulnerability (*p*<0.001), and crude odds ratio (OR) for having a vulnerability was 2.5 (95 % confidence interval (CI) 1.6 – 4.0) for those ≥25 years of age compared to those 18 years and younger. When adjusting for intake of alcohol through logistic regression analyzes this association became stronger. The assailant mean age was 30 in the vulnerability group and 26 years among those without vulnerability (*p*=0.012), and crude OR for having a vulnerability was 2.4 (95 % CI 1.2 – 4.8) for those ≥24 years of age compared to those 18 years and younger. Adjustment for patient age and alcohol diluted this association. Of the patients in the vulnerability group 25 % were unemployed, compared to 8 % of those without vulnerability. Half of the patients with vulnerability were students, whereas 68 % of the non-vulnerable were students. The patients without vulnerability more often were assaulted by casual contacts and strangers than the patients in the vulnerability group. There were increased frequencies of known assailant (friend/family) in the vulnerability group. The patients with vulnerability were more likely than those without to be assaulted between 7 a.m. and midnight, although both groups were more likely to be assaulted at nighttime than during the day. Of the patients 67 % reported alcohol intake prior to the assault. Those without vulnerability reported significantly more alcohol consumption than those with vulnerability. Patients with vulnerability were more frequently exposed to light/moderate physical violence than the ones without vulnerability. Correspondingly, medical findings of minor body injury were documented more often in the vulnerability group. Table 2 shows that some of the associations were strengthened when we adjusted for patient age and alcohol intake, whereas others were not.

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| **Table 2. Characteristics among 573 women who attended the Trondheim SAC, and by vulnerability, 2003 - 2010**  |
|  |  |  **Vulnerability, N=573** |
| **Variable** | **Total, N=573****n (%)** | **Yes, n=335****n (%)** | **No, n=238****n (%)** | ***p*-value** | **Crude OR** | **OR adjusted for patient age** |  | **OR adjusted for patient age and alcohol intake**  |
| **Patient age** |  |  |  |  |  |  |  |  |  |
| < 18 years | 197 (34) | 103 (31) | 94 (40) |  | Reference |  |  | Reference |
|  18 - 24 years | 229 (40) | 124 (37) | 105 (44) |  | 1.1 (0.8 – 1.6) |  |  | 1.8 (1.1-2.8) |
|  ≥ 25 years | 147 (26) | 108 (32) | 39 (16) | < 0.001[[1]](#footnote-1) | 2.5 (1.6 – 4.0) |  |  | 3.6 (2.1-6.1) |
| **Assailant age** |  |  |  |  |  |  |  |  |
| <18 years | 38 (7) | 16 (5) | 22 (9) |  | Reference | Reference |  | Reference |
| 18-24 years | 109 (19) | 61 (18) | 48 (20) |  | 1.7 (0.8-3.7) | 1.7 (0.8-3.6) |  | 1.6 (0.7-3.9) |
| >24 years | 255 (45) | 162 (48) | 93 (39) | 0.0291 | 2.4 (1.2-4.8) | 1.8 (0.8-3.9) |  | 1.5 (0.6-3.7) |
| Missing | 171 (30) | 96 (29) | 75 (32) |  |  |  |  |  |
| **Patient occupation** |  |  |  |  |  |  |  |  |
| Employed | 121 (21) | 69 (21) | 52 (22) |  | 1.3 (0.8-2.0) | 1.1 (0.7-1.8) |  | 1.3 (0.7-2.1) |
| Student | 330 (58) | 168 (50) | 162 (68) |  | Reference | Reference |  | Reference |
| Unemployed | 101 (18) | 83 (25) | 18 (8) | < 0.0011 | 4.5 (2.6-7.8) | 3.5 (1.9-6.7) |  | 3.5 (1.8-6.9) |
| missing | 21 (4) | 15 (5) | 6 (3) |  |  |  |  |  |
| **Relationship to the assailant** |  |  |  |  |  |  |  |  |
| Partner | 28 (5) | 23 (7) | 5 (2) |  | 2.4 (0.9 – 6.6) | 1.8 (0.6 – 4.9) |  | 1.8 (0.5-6.7) |
| Friend/family | 259 (45) | 170 (51) | 89 (37) |  | Reference | Reference |  | Reference |
| Casual contact | 145 (25) | 73 (22) | 72 (30) |  | 0.5 (0.4 – 0.8) | 0.5 (0.3 – 0.7) |  | 0.6 (0.4-1.0) |
| Stranger | 77 (13) | 36 (11) | 41 (17) |  < 0.001[[2]](#footnote-2) | 0.5 (0.3 – 0.8)  | 0.4 (0.2 – 0.6) |  | 0.4 (0.2-0.7) |
| Missing | 64 (11) | 33 (10) | 31 (13) |  |  |  |  |  |
| **Place of assault** |  |  |  |  |  |  |  |  |
| Private | 342 (60) | 211 (63) | 131 (55) |  | Reference | Reference |  | Reference |
| Public | 180 (31) | 94 (28) | 86 (36) | 0.037[[3]](#footnote-3) | 0.7 (0.5-1.0) | 0.7 (0.5-1.0) |  | 0.8 (0.5-1.1) |
| Missing | 51 (9) | 30 (9) | 21 (9) |  |  |  |  |  |
| **Time of day of assault** |  |  |  |  |  |  |  |  |
| 0700-2400 | 157 (27) | 109 (33) | 48 (20) |  | 2.2 (1.5-3.2) | 2.7 (1.7-4.2) |  | 1.8 (1.1-3.0) |
| 0000-0700 | 326 (57) | 167 (50) | 159 (67) | < 0.0013 | Reference | Reference |  | Reference |
| missing | 90 (16) | 59 (18) | 31 (13) |  |  |  |  |  |
| **Alcohol intake** |  |  |  |  |  |  |  |  |
| No intake | 142 (25) | 107 (32) | 35 (15) |  |  Reference | Reference |  |  |
| < 5 units | 106 (19) | 57 (17) | 49 (21) |  | 0.4 (0.2-0.7) | 0.3 (0.2-0.5) |  |  |
| >5 units | 275 (48) | 138 (41) | 137 (58) | < 0.0011 | 0.3 (0.2-0.5) | 0.3 (0.2-0.4) |  |  |
| missing | 50 (9) | 33 (10) | 17 (7) |  |  |  |  |  |
| **Physical violence** |  |  |  |  |  |  |  |  |
| None/verbal | 154 (27) | 78 (23) | 76 (32) |  | Reference | Reference |  | Reference |
| Light/moderate | 231 (40) | 143 (43) | 88 (37) |  | 1.6 (1.1-2.4) | 1.5 (1.0-2.4) |  | 1.6 (1.0-2.5) |
| Severe | 34 (6) | 23 (7) | 11 (5) | 0.0461 | 2.0 (0.9-4.5) | 1.4 (0.6-3.3) |  | 1.0 (0.4-2.6) |
| Missing | 154 (27) | 91 (27) | 63 (27) |  |  |  |  |  |
| **Bodily injury (extragenital)** |  |  |  |  |  |  |  |  |
| none | 229 (40) | 116 (35) | 113 (48) |  |  Reference | Reference |  | Reference |
| minor | 251 (44) | 168 (50) | 83 (35) |  | 2.0 (1.4-2.9) | 1.9 (1.3-2.8) |  | 2.8 (1.8-4.3) |
| moderate/seriousmissing | 35 (6)58 (10) | 21 (6)30 (9) | 14 (6)28 (12) | 0.0011 | 1.5 (0.7-3.0) | 1.1 (0.5-2.3) |  | 1.3 (0.6-2.9) |

*Disability vs. not*

We compared the patients with disability and those without. Among the 54 patients with intellectual and/or physical disabilities 61 % reported the assailant to be a family member or an acquaintance, and none of the assailants in this group was a partner, *X2*(3, *N* = 54) = 13.4, *p* < .01 . Having a disability was associated with assault between 7 a.m. and midnight, *X2* (1, *N* = 54) = 9.8, *p* < .01. The disability group reported less alcohol intake prior to the assault (41%), *X2* (2, *N* = 54) = 19.9, *p* < .01.

*Mental health problems vs. not*

We made comparisons between the patients with mental health problems and those without. Mental health problems increased with age, but patients under 18 years also had a high proportion of this vulnerability (31 %). Mental health problems were associated with assault during daytime/evening, *X2* (1, *N* = 234) = 13.3, *p* < .01, with unemployment, *X2* (2, *N* = 234) = 38.4, *p* < .01, with physical violence and with bodily injury related to the assault, *X2* (2, *N* = 234) = 7.2, *p* = .03. This group also more often reported a partner assault and fewer stranger assailants. The latter result was not statistically significant.

*Substance abuse vs. not*

When comparing women with and without substance abuse we found that among the former, 63 % were older than 25 years, *X2* (2, *N* = 51) = 45, *p* < .01. This vulnerability group also had high frequencies of assault by more than one assailant (26%), *X2* (1, *N* = 51) = 9.9, *p* < .01, and a high unemployment rate (63 %) compared to those without, *X2*(2, *N* = 51) = 94.4, *p* < .01. They had higher frequencies of bodily injury related to the assault, *X2* (2, *N* = 51) = 7.8, *p* = 0.02. Police reporting rate was low (49 %), although the latter finding was not statistically significant. Most of these patients also reported to have mental health problems, see Figure 2.

*Prior sexual assault vs. not*

We compared those reporting prior SA with those not. Prior sexual assault was strongly associated with known assailants (53%), *X2*(3, *N* = 200) = 13.2, *p* < .01, and older assailants, *X2*(2, *N* = 200) = 19.8, *p* < .01. A quarter of the patients who reported prior sexual assault(s) were under the age of 18 years. There was also a higher occurrence of private place of assault in this group, but that finding was not statistically significant. In addition, the unemployment rate among these patients was higher than in the rest of the sample (27%), *X2*(2, *N* = 200) = 24, *p* < .01, and reported alcohol intake prior to the assault was lower, *X2*(2, *N* = 200) = 13.4, *p* < .01.

**Figure 2. Theoretical model (venn diagram) depicting the four vulnerability factors discussed in the text, and their internal co-occurrences. Not drawn to scale.**

Drug abuse

Mental health problems

Prior sexual assault

Disability

*More than one vulnerability factor*

We examined possible associations between the number of vulnerability factors reported and certain sociodemographic and assault characteristics. We found that those reporting more than one vulnerability factor were older, *X2* (2, *N* = 164) = 31.4, *p* < .01 and reported older assailants, *X2* (2, *N* = 164) = 19.2, *p* < .01 than those reporting one or less than one vulnerability. In addition, we found that those with more than one vulnerability more often were unemployed, *X2*(2, *N* = 164) = 63, *p* < .01. Among the assault characteristics, those with more than one vulnerability more often reported penile penetration in more than one orifice, *X2*(2, *N* = 164) = 16.4, *p* = 0.012. Table 3 illustrates some associations between assault characteristics and the number of vulnerability factors present in the victims.

| **Table 3. Characteristics among 573 women who attended the Trondheim SAC, and by vulnerability, 2003 - 2010.**  |
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|  |  | **Vulnerability, N=573** |
| **Variable** | **Total, N=573****n (%)** | **No, n=238****n (%)** | **One vulnerability factor, n=171** | **>1 vulnerability factor,** **n=164** | ***p*-value** |
| **Patient age** |  |  |  |  |  |
| < 18 years | 197 (34) | 91 (40) | 68 (40) | 35 (21) |  |
| 18 - 24 years | 229 (40) | 105 (44) | 56 (33) | 68 (42) |  |
| ≥ 25 years | 147 (26) | 39 (16) | 47 (28) | 61 (37) | < 0.0011 |
| **Assailant age** |  |  |  |  |  |
| <18 years | 38 (7) | 22 (9) | 13 (8) | 3 (2) |  |
| * 1. ears
 | 109 (19) | 48 (20) | 41 (24) | 20 (12) |  |
| >24 years | 255 (45) | 93 (39) | 74 (43) | 88 (54) | 0.0012 |
| Missing | 171 (30) | 75 (32) | 43 (25) | 53 (32) |  |
| **Patient occupation** |  |  |  |  |  |
| Employed | 121 (21) | 52 (22) | 44 (26) | 25 (15) |  |
| Student | 330 (58) | 162 (68) | 99 (58) | 69 (42) |  |
| Unemployed | 101 (18) | 18 (8) | 24 (14) | 59 (36) | < 0.0012 |
| Missing | 21 (4) | 6 (3) | 4 (2) | 11 (7) |  |
| **Sexual acts** |  |  |  |  |  |
| No penetration | 71 (12) | 28 (12) | 23 (14) | 20 (12) |  |
| Penile in one orifice | 261 (46) | 108 (45) | 82 (48) | 71 (43) |  |
| Penile penetration in more than one orifice | 75 (13) | 29 (12) | 12 (7) | 34 (21) |  |
| No recollection | 147 (26) | 71 (30) | 43 (25) | 33 (20) | 0.0122 |
| Missing | 19 (3) | 2 (1) | 11 (6) | 6 (4) |  |

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1 Chi-square, *df=1*

2 Chi-square, *df=2*

**Discussion**

At least one vulnerability factor was present in 59 % of the cases: 9 % had intellectual or physical disability; 41 % had a history of present or former mental health problems; 9 % had present or former alcohol/substance abuse; while in 35 % of the cases patients reported one or more prior sexual assaults. More than one vulnerability factor was present in 29 %. Reporting at least one vulnerability factor was associated with a higher patient age, unemployment, a higher frequency of reported light/moderate physical violence and the documentation of minor body injury. In contrast, those without vulnerability more often were students, assaulted during night time, by a casual or stranger assailant and reporting a higher intake of alcohol prior to the assault.

 The analyzes in this study have been focused on vulnerability factors on a compound level. We have been unable to find any previous reports in the literature with parallel descriptions of multiple vulnerability factors among patients attending health care after a sexual assault. The occurrence of one or more vulnerability factors in 59 % of our patients is therefore considered as new information. What is also new in this study is that it, with reference to our main hypothesis, describes unique differences in patterns of sexual assaults committed against women having specific vulnerability factors compared with women without these factors.

 In this study 9 % of the patients had intellectual and/or physical disability. This result is consistent with two other studies, one by Du Mont et al. from 2009 where 11 % reported physical or cognitive disabilities and a study by Saint-Martin et al. from 2007 which stated that 7 % were either physically or mentally handicapped. None of these studies have analyzed associations between assault characteristics and disabilities. Our study shows associations between physical and/or intellectual disabilities and sexual assault at daytime or in the evening and by someone whom the patients know, but not a partner. Patients with disabilities also reported less alcohol intake prior to the assault. The patterns of assault committed against people with disabilities resemble those committed against children, and our findings imply a need for public health prevention programs which protect people with disabilities from being sexually assaulted by their caregivers. Future research should investigate sexual assaults against people with specific types of disability, differentiating between different forms of physical and intellectual disabilities, since knowledge on these topics is sparse.

Among the patients in our sample 41 % had a history of present or former mental health problems. Our study reveals associations between mental health problems and older victims and assault between 7 a.m. and midnight. It was also associated with physical violence, bodily injuries and partner assaults. The British study already sited found even a higher level of mental health problems among the SAC victims than we found (Creighton & Jones, 2012). Two thirds of a sample of 269 adults demonstrated psychiatric illness. In summary, that study described occurrences of psychiatric diagnoses, but did not relate the diagnoses to assault characteristics or other clinical relevant information. In a report from the Copenhagen SAC 38 % gave information on former psychiatric treatment (Rust, 2008). The studies cited are in accordance with our findings, highlighting the concerning level of mental health problems among victims attending SACs. Our findings highlight that women with mental health problems are especially vulnerable regarding intimate partner assaults, and presenting with greater bodily injuries than other kinds of assaults. There is still a great need for research regarding sexual assault against victims with mental health problems. More knowledge on this topic could turn out to be influential in future planning of management and prevention strategies.

In this study 9 % reported a history of present/former alcohol/substance abuse. Assault characteristics associated with alcohol/substance abuse were older patients, more than one assailant, unemployment, documented bodily injuries and low police reporting rates. To our knowledge, these are findings not previously described. This implies that sexual assaults committed against women with a history of alcohol/substance abuse are relatively serious and brutal. Still, these assaults are seldom reported to the police, which is a disturbing finding. Even higher prevalence of alcohol/addiction problems than we have found from our Norwegian SAC have been reported in the literature. In a SAC-study from the US 40 % of female victims reported a prior substance abuse history (Resnick et al. 2013). Most of the SAC studies in which different aspects of alcohol/substance abuse are discussed do not relate the condition of abuse with other assault characteristics. Almost all of the patients with alcohol/substance abuse also reported to have a mental health problem, see Figure 2. This implies a need for increased understanding of how the two vulnerability factors interact. It also implies a need for research on how mental health treatment of women with alcohol/substance abuse could possibly improve protection against sexual assaults towards this group.

35 % of our patients reported one or more prior sexual assault. For those aged 12 – 18 years, as many as one fourth stated that they had been previously sexually assaulted, but for those who were older, almost half of the patients reported this issue. The World Report on Violence and Health has listed previous sexual assault as one of several risk factors for being sexually assaulted (World Health Organization, 2002). Sexual revictimization is a controversial topic and more quality research is needed about this in the future.

As we have illustrated in Table 1, Table 3 and Fig. 2, many of the patients had more than one vulnerability factor. We examined whether there were any associations between the number of vulnerability factors reported and certain sociodemographic and assault characteristics, and to our knowledge this has never been reported from a SAC. The assaults against those reporting more than one vulnerability factor show a tendency toward being more serious and violent in nature, exemplified by the strong association with penile penetration in more than one orifice in this group. This corresponds with a statement in World Report on Violence and Health, saying that the various risk factors have an additive effect, so that the more factors present, the greater the likelihood of sexual violence (World Health Organization, 2002). We may assume that the different vulnerability factors interact with one another in complex ways. This assumption could be exemplified by the findings from a population based study stating that associations between sexual assault and substance abuse are reciprocal in nature, meaning that prior assault increases risk for substance abuse and vice versa (Testa, VanZile-Tamsen, & Livingston, 2007). In our study almost all of the patients with alcohol/substance abuse also reported to have a mental health problem, illustrating how vulnerability factors tend to co-occur. Among those not reporting any of the vulnerability factors we found that this was associated with young age, being a student and a high voluntary alcohol intake prior to the assault. As a consequence of these results one may claim that young, female students tend to get vulnerable to sexual assault by episodic excessive drinking. This is equivalent with a population study concluding that sexual assault against young women who are too drunk to consent seems to be prevalent in Norway (Pape, 2014).

*Limitations*

The fact that data were collected retrospectively and partly by self-reporting is a limitation of this study. For some of the variables there is a considerable amount of missing information. Whether our data regarding alcohol/substance abuse are reliable, is questionable, as many patients may hesitate to give such information. Our choice of variables, some of them categorized, was based on prior studies from our SAC (Hagemann et al., 2013; Stene et al., 2010), and from other SAC studies, for example the categorization of bodily injury (McGregor, Du Mont, & Myhr, 2002). Although there may be limitations in using variables from other studies this way, we still regard the variables chosen as being relevant and representative, by making it possible to compare and contrast our findings from what has previously been found in similar SAC studies.

When determining vulnerability factors for sexual offenses, our SAC has previously registered and reported these four specific factors (Hagemann et al., 2013; Stene et al., 2010). We are aware that there are other factors which are considered as risk- and vulnerability factors for sexual assaults (World Health Organization, 2002). Still, we regard our four chosen vulnerability factors as being crucial in the sense that they describe especially pervasive and inherent qualities of the victims, in a long-term perspective. One factor, which may be expected on a list of obvious vulnerability factors for sexual assault is young age. Different aspects of the victims` age have, however, already been thoroughly described in the literature, which partly explains why it is not included on our list of vulnerability factors (Rust, 2008; World Health Organization, 2002).

Another limitation is the question of whether our results could be generalizable to a majority of rape victims or not. Only a minority of victims of sexual assaults seeks post-assault medical care, and we could assume that those who do are likely to be more in the need of emergency treatment than those who do not? The results in the study would probably be different if the whole population of sexually assaulted victims were included. Furthermore, some information about the assaults has presumably been lost, since many victims report amnesia when asked specifically about the events. In some cases it is difficult to know if an assault actually has happened, or if physical violence or threats were involved. Information about the assailant was given by the victim or her companion. As a consequence, eventual false accusations are not excluded from this study. Among thestrengths of the study is the large number of variables, a long observation period of more than seven years, and a relatively large sample. Still, some of the analyses could be subjected to a type II error.

*Conclusions* We believe that the specific four vulnerability factors investigated in this study provide add to our understanding of both sexual assault victims and sexual assailants. There are obvious patterns of differences in the nature of sexual assaults committed against victims with specific vulnerability factors compared with victims without these factors. The high prevalence of mental illness and substance abuse among patients attending a SAC imply the need for increased professional mental health care involvement towards this group. The reporting rates to police and health care are, however, very low, and, consequently, only a minority of victims are therefore referred to necessary mental health treatment after sexual assault. Vulnerability factors among female sexual assault victims is a complex area which is sparsely investigated. More knowledge is needed in the future in order to improve preventive and protective means towards individuals who are at increased risk of sexual assault. The development of routines for both health care to victims and handling of their judicial rights must be built upon research. The responsibility for taking action must be addressed to political authorities, to both somatic and mental health care professionals and to the police and legal systems.

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1. Chi squared, *df*=2

2 Chi-squared, *df*=3

3 Chi-squared, *df*=1 [↑](#footnote-ref-1)
2. [↑](#footnote-ref-2)
3. [↑](#footnote-ref-3)