

Prevalence and health correlates of workplace violence and discrimination – a cross-sectional study among hospital employees in Switzerland

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1 **Prevalence and health correlates of workplace violence and discrimination**
2 **– a cross-sectional study among hospital employees in Switzerland**

3

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11 **Abstract**

12

13 **Background**

14 Violence and discrimination are common events at work, especially in the health care setting.
15 Nevertheless, comprehensive data on their prevalence and health correlates among the entirety
16 of hospital staff is missing. This study aimed to estimate the prevalence of different self-reported
17 forms of workplace violence and discrimination among hospital employees in Switzerland and to
18 investigate the association between such experiences at work and the general and mental
19 health status.

20

21 **Methods**

22 This cross-sectional study was based on secondary data from a company survey among five
23 public hospitals and rehabilitation clinics in German-speaking Switzerland conducted in 2015/16
24 (N = 1,567). Relative frequencies of different forms of violence and discrimination at work were
25 calculated for the entire study population and for the occupational subgroups. These prevalence
26 data were compared with a representative sample of the general Swiss working population as a
27 reference group. Multiple logistic regression analyses were further computed to investigate the
28 association between the number of different experienced forms of violence and/or discrimination
29 at work and several poor general and mental health outcomes (poor self-rated health, sleep
30 disorders, psychological stress, mental problem, burnout).

31

32 **Results**

33 23% of hospital employees experienced at least one form of discrimination or violence at work
34 in the past year, compared to 18% of the general working population. Nurses and midwives
35 were by far the most affected occupational group regarding all forms of violence. More and
36 particularly most exposed hospital employees with regard to experiences of violence and/or
37 discrimination at work showed almost consistently increased prevalence rates and odds ratios
38 for the studied poor mental and general health outcomes. Prevalence rates and adjusted odds

39 ratios for strong sleep disorders, strong stress feelings and increased burnout symptoms were
40 between three and four times higher among the most exposed compared to those hospital
41 employees who did not make any of these experiences at work at all.

42

43 **Conclusions**

44 Study findings underline the importance of an active combat against violent and discriminatory
45 behaviors in health care. Prevention strategies should particularly focus on nurses and
46 midwives, which turned out to be the most affected and exposed group of all health professions.

47

48 **Keywords**

49 violence, discrimination, workplace, work, health, hospital employees, health professionals,
50 health care

51

52 **Background**

53

54 Workplace violence and discrimination are major and growing problems, which can be found in
55 virtually all of the occupational groups (1, 2). The International Labour Organization (ILO) of the
56 United Nations defines workplace violence as “any action, incident or behavior that departs from
57 reasonable conduct in which a person is assaulted, threatened, harmed, injured in the course
58 of, or as a direct result of, his or her work” (3). Discrimination on the other hand is defined by the
59 ILO as “any distinction, exclusion or preference made on the basis of race, color, sex, religion,
60 political opinion, national extraction or social origin, which has the effect of nullifying or impairing
61 equality of opportunity and treatment in employment or occupation” (4). Discrimination
62 adversely affects human rights (4).

63 There are many different forms of discrimination and violence. The latter can be divided into a
64 physical, a psychological and a sexual dimension according to the ILO (3). Additionally, a
65 distinction between internal (between employees) and external violence (between an employee
66 and another person present at work) can be made (1). Health professionals are especially

67 affected from workplace violence with a prevalence in an international comparison up to 17% for
68 physical and up to 67% for psychological violence within a year (5, 6). Sexual harassment
69 during the occupational career was reported by every second academic medical faculty women
70 in the United States (7). Previous evidence suggests a prevalence of discrimination in hospital
71 workers around 14% during the past year (8).

72 However, the true extent of workplace violence in the health care sector is difficult to assess, as
73 a high number of unreported cases must be assumed (9). Reasons for systematic
74 underreporting might be that employees do not anticipate a change by the reporting of violence
75 experiences (10) or they underestimate its negative consequences (11). Underreporting is a
76 particular problem in health workers with direct patient contact, as they tend to excuse the
77 behavior of their attackers, for example due to the mental status, pain or emergency situation of
78 their patients (12).

79 There is evidence that workplace violence and discrimination among health professionals have
80 a huge (public) health impact. A systematic review revealed a broad range of negative
81 consequences of workplace violence in the health care setting, which can be divided into seven
82 categories: physical consequences (direct injuries of the body), psychological consequences
83 (as depressive symptoms), emotional affecting (as anxiety), adverse effect on the workplace
84 functioning (as decrease in productivity), negative impact on health care quality (as patient
85 safety), social consequences (on private and family life) and financial consequences (as the
86 loss of income due to absences from work) (13). Similarly, a meta-analysis on the effect of
87 workplace discrimination due to race showed a negative impact on the attitude to work and on
88 the physical and psychical health of the affected persons (14).

89 Many of the above-mentioned consequences of workplace violence and discrimination
90 obviously have a detrimental effect not only on an individual level, but also on a company level
91 and on the societal level. While longer sick leaves and absences from work may be the most
92 important factors for the company, a loss of quality in health care has a serious impact on the
93 society as a whole. Furthermore, as health professionals usually face high work demands, a

94 loss of productivity in consequence of experiencing violence at work is a serious challenge in
95 health care.

96 In the Swiss Health Survey from 2017 the experience of at least one form of violence or
97 discrimination at work in the previous year was reported by 21.1% of women and 17.5% of men,
98 with an increase in both sexes compared to the previous survey in 2012 (15).

99 Although workplace violence and discrimination have been identified and recognized as a
100 common phenomenon in the health care sector, the prevalence and health correlates of this
101 specific psychosocial risk factor among health care workers are largely unexplored and
102 underresearched, particularly in Switzerland. For this reason, the present study has been
103 conducted, based on survey data collected among hospital employees and particularly health
104 professionals from German-speaking Switzerland.

105 Against the background of the lack of evidence in this regard, this study aimed to investigate the
106 following research questions:

- 107 1. What is the prevalence of different aspects and accumulated experiences of workplace
108 violence and discrimination among hospital employees and particularly among health
109 professionals in Switzerland, and in comparison with the entire working population?
- 110 2. Is there consistently a pronounced and negative association and a halfway linear dose-
111 response relationship between accumulated experiences of workplace violence and/or
112 discrimination on the one hand and different health outcomes on the other hand among
113 hospital employees?

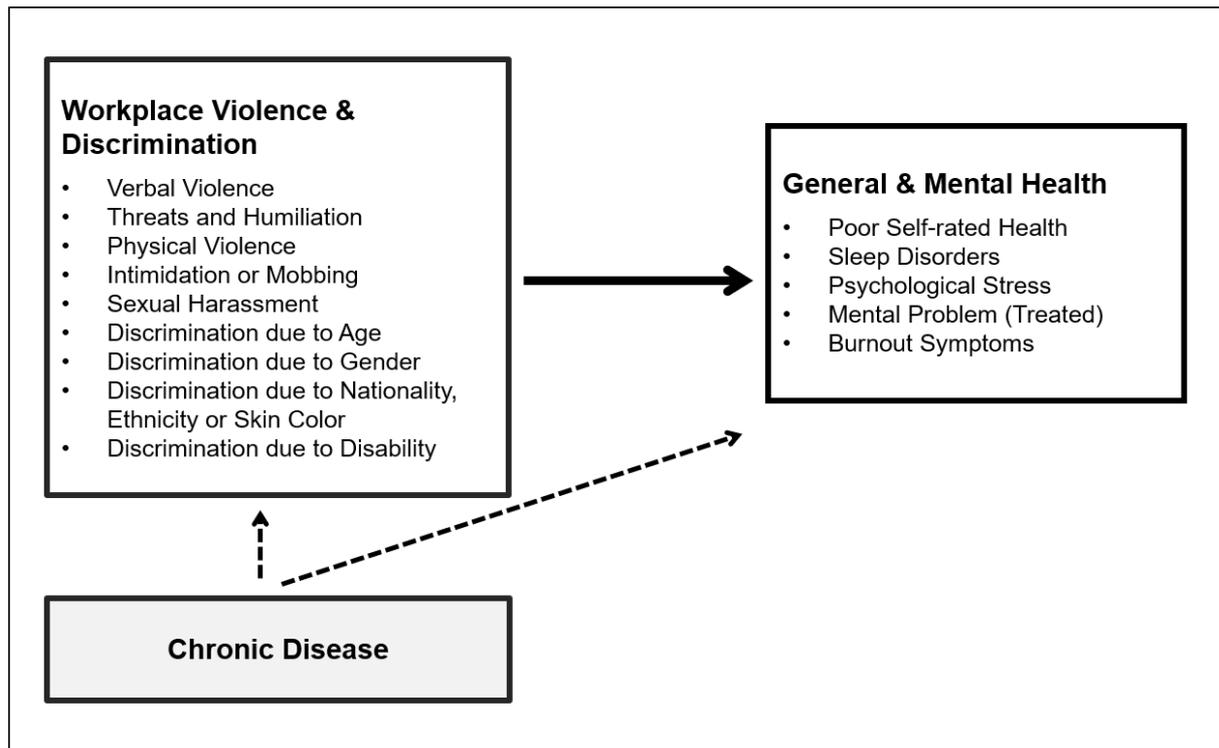
114 Figure 1 illustrates the theoretical path model of the postulated association between
115 experienced workplace violence and/or discrimination and health status, which is assumed to
116 be potentially confounded by chronic disease.

117

118 **Figure 1**

119 Theoretical path model showing the assumed and studied associations between exposure,
120 outcome and confounding variables

121



122

123

124 **Methods**

125

126 **Sample and procedure**

127 This single sample, cross-sectional, quantitative study design is based on a company survey,
 128 which was administered to five hospitals in German-speaking Switzerland in 2015 and 2016.

129 The hospitals participating in the survey were selected by convenience sampling (non-
 130 probability sampling) and included one university hospital, one cantonal hospital, one district
 131 hospital and two rehabilitation clinics. The size of hospitals varied between 480 and 2,200
 132 permanent employees. The self-administered paper-and-pencil questionnaire included 100
 133 questions in total and took about 30 minutes to complete. Its overall aim was to gather
 134 information on working conditions and health of hospital employees.

135 All permanent employees of the selected hospitals received the survey. Thus, no restriction was
 136 made concerning the different professions working in a hospital, hierarchical levels or business
 137 units. Employees were allowed to fill out the survey during working time, but could also take it
 138 home to complete if preferred. Individuals were asked to send the questionnaire back to the

139 researchers by a prepaid reply envelope within four weeks, and got a reminder one week before
140 submission deadline. For the statistical analysis, 1567 completed questionnaires were available,
141 corresponding to an overall response rate of 41%. The response rates ranged from 36% to 49%
142 between the participating hospitals.

143

144 **Measures**

145 ***Exposure variable(s)***

146 *Violence and discrimination at work.* Experiences of workplace violence and discrimination were
147 measured by the question “Have you experienced the following in the past 12 months at work?”
148 with a note that multiple answers were possible. Ten answer categories were given:
149 “discrimination due to age”, “discrimination due to gender”, “discrimination due to nationality,
150 ethnicity or skin color”, “discrimination due to disability”, “verbal violence”, “threats and
151 humiliation”, “physical violence”, “intimidation or mobbing”, “sexual harassment”, and “none of
152 them”. The question and response options were adopted from the Swiss Health Survey,
153 allowing to make a direct comparison with secondary survey data representing the working
154 population of (German-speaking) Switzerland (15). For the association analyses, a sum scale
155 which simply adds up the number of experienced and surveyed different aspects of workplace
156 violence and/or discrimination was constructed. The sum scale starting with 0 and a possible
157 maximum score of 10 was classified into three categories of “none” (0), “a single” (1) and “two
158 or more” (2+).

159

160 ***Outcome variables***

161 *General and mental health.* With the exception of burnout, which was assessed by an
162 established multiple-item measure, single-item measures were utilized to assess the general
163 and mental health status of the study population of hospital employees. Most of these widely
164 used items were taken from the Swiss Health Survey, allowing to make a comparison with a
165 representative sample of the working population in German-speaking Switzerland.

- 166 • *Self-rated health.* Self-reported general health status was measured by asking “How is your
167 health status in general?” with response categories from 1 (“very good”) to 5 (“very bad”).
168 Self-rated health (SRH) is an established and well-validated measure of general health,
169 showing a strong association with both mortality (16) and morbidity (17). Due to its strongly
170 skewed distribution, SRH was dichotomized (and binary coded) into two categories,
171 combining answers from “very good” and “good” (value 0) and from “moderate” to “very bad”
172 (1), labeled as “poor SRH”, as suggested by the research literature (18).
- 173 • *Sleep disorders.* Sleeping problems were assessed by asking the respondents about having
174 had complaints in the past four weeks such as difficulties in falling asleep or sleeping
175 through, with three answer categories dichotomized into “none at all/only a little” (0) and
176 “strong” (1), in order to calculate logistic regression analyses.
- 177 • *Psychological stress.* General stress in a psychological (and not physiological sense) was
178 measured by a given definition (“Stress means a condition in which a person feels tense,
179 restless, nervous or anxious or is unable to sleep at night because his/her mind is troubled
180 all the time.”), followed by the question: “Did you feel stressed in the past 12 months?” For
181 the analysis, response categories, initially on a five-point Likert Scale from 1 (“not at all”) to
182 5 (“very strong”), were then dichotomized and binary coded, distinguishing between 0 “less
183 stressed” (“not at all”, “a little”, “moderate”) and 1 “strongly stressed” (“strong”, “very
184 strong”). This single-item measure of general stress is a widely used and well-validated
185 indicator of mental strain (19).
- 186 • *Mental problem.* In order to measure a psychological problem, survey participants were
187 directly asked if they had been treated due to a mental problem in the past 12 months, with
188 the answer options “no” (0) and “yes” (1).
- 189 • *Burnout.* Burnout symptoms were measured using the 6-item subscale of personal burnout
190 from the Copenhagen Burnout Inventory (CBI) (20). The German version of this scale asks
191 about the frequency of feeling tired, of being physically exhausted, of being emotionally
192 exhausted, of thinking “I can’t go any longer”, of being drained, and of feeling weak and
193 vulnerable to diseases. Each item can be answered on a five-point Likert scale ranging from

194 0 (“never”) to 4 (“always”). The sum score out of these answers of the CBI was calculated
195 and ranged between 0 and 24, with values above 16 being considered as an increased risk
196 of burnout.

197

198 ***Confounding variable***

199 Chronic disease as a potential confounder was measured by the question “Do you have a
200 chronic disease or health problem?” (yes/no), followed by the explanation that this is a condition
201 which is already lasting or still ongoing for at least 6 months.

202

203 ***Control variables***

204 Sex, age and education were used as control variables. Age was measured by asking about the
205 age category the respondent belongs to (< 25 years, 25-34 years, 35-44 years, 45-54 years and
206 ≥ 55 years). Education was measured by asking participants about their highest degree of
207 education. The 12 given educational qualifications were categorized into four levels of
208 education: 1 “low” (no vocational education), 2 “medium” (basic vocational
209 education/apprenticeship), 3 “high” (higher vocational education or high-school diploma), and 4
210 “very high” (university degree).

211 For stratified analyses or rather differentiated descriptive statistics, study or survey participants
212 were further categorized into four occupational groups (nurses and midwives, physicians and
213 other academics, medical-therapeutic and medical-technical staff, administrative and other
214 service staff).

215

216 ***Analyses***

217 To answer the first research question regarding the prevalence rates of workplace violence and
218 discrimination among health care workers in German-speaking Switzerland, relative frequencies
219 of exposure variables (single items and sum scale of different aspects of workplace violence
220 and discrimination) were calculated for the entire study population and additionally stratified by
221 the four occupational groups. Such descriptive statistics were provided for the study sample as

222 well as for the comparable and representative subsample of the Swiss Health Survey of 2017
223 as a reference group.
224 Multiple logistic regression analyses were then performed to study the second research
225 question about the assumed and possibly confounded association and dose-response
226 relationship between the accumulated number of experiences of violence and discrimination at
227 work and different general and mental health outcomes. More precisely, multiple adjusted odds
228 ratios (aOR) were calculated to estimate the relative and health-related risk of such experiences
229 in the study population.

230

231 **Results**

232

233 **Descriptive statistics**

234 The prevalence of experiences of different forms or aspects of violence and discrimination at
235 work among hospital employees (in the past twelve months) is shown in Table 1. With a look at
236 the entirety of hospital employees, the most frequently reported form of discrimination was due
237 to age (5%), followed by discrimination due to gender (4%), nationality, ethnicity or skin color
238 (3%) and disability (less than 1%). In physicians and other academic staff, discrimination due to
239 gender was the most prevalent form (8%).

240 With regard to experiences of violence at work among the studied hospital employees,
241 intimidation or mobbing was the most commonly reported form (10%), followed by verbal
242 violence (7%), threats and humiliation (5%), sexual harassment (1%), and physical violence
243 (1%). In the working population of German-speaking Switzerland, intimidation or mobbing was
244 also the most frequently reported form of violence (7%). In comparison with other occupational
245 groups, nurses and midwives were by far the most affected from all forms of violence.

246 Overall, almost a quarter (23%) of the surveyed hospital employees reported at least one form
247 of discrimination or violence in the past year, whereby nurses and midwives were most
248 frequently affected (24%), followed by physicians and other academic staff (23%), medical-
249 therapeutic and medical-technical staff (21%) and administrative and other service staff (19%).

250 Hospital employees and particularly health professionals were found to be more frequently
 251 affected by experiences of violence and discrimination at work than employed persons and
 252 working people in general, which make such experiences at work on average in “only” 18% of
 253 the cases.

254

255 **Table 1**

256 One-year prevalence of workplace discrimination and violence among occupational groups of
 257 hospital employees

	Nurses and midwives (N = 718)	Physicians and other academic staff (N = 293)	Medical-therapeutic and medical-technical staff (N = 221)	Administrative and other service staff (N = 325)	Total hospital employees (N = 1,557)	Working population of German-speaking Switzerland (N = 8,281) ¹⁾
Forms of violence						
Verbal abuse	9.3%	6.8%	3.6%	4.6%	7.1%	4.7%
Threats and humiliation	6.1%	5.1%	4.5%	4.0%	5.3%	4.1%
Physical violence	1.7%	0.3%	0.5%	0.0%	0.9%	1.1%
Intimidation or mobbing	11.3%	8.2%	8.5%	8.9%	10.0%	6.5%
Sexual harassment	1.5%	0.7%	0.0%	0.6%	1.0%	0.8%
Forms of discrimination						
Due to age	4.5%	4.4%	4.1%	6.2%	4.8%	5.7%
Due to gender	2.9%	8.2%	4.5%	2.5%	4.0%	3.9%
Due to nationality, ethnicity or skin color	2.2%	4.1%	1.8%	2.5%	2.6%	3.4%
Due to disability	0.3%	0.0%	0.9%	0.6%	0.4%	0.8%
Total number of different forms of violence and/or discrimination						
None (0)	75.6%	76.8%	78.7%	80.9%	77.4%	81.7%
One (1)	14.3%	13.0%	14.9%	10.5%	13.4%	10.6%
Accumulated (2+)	10.0%	10.2%	6.3%	8.6%	9.2%	7.7%

258 ¹⁾Based on weighted and extrapolated data from the Swiss Health Survey 2017

259

260 **Multiple logistic regression analyses**

261 Table 2 illustrates the associations between the experience of workplace violence and/or
262 discrimination and different dimensions of health among hospital employees: After adjusting for
263 sex, age, education (control variables) and chronic disease (potential confounding variable),
264 experiencing one single form of discrimination or violence at work (compared to having not
265 experienced any violence or discrimination) was significantly associated with strong sleep
266 disorders (19% vs. 11%, aOR 2.0), strong psychological stress (19% vs. 11%, aOR 1.7) and
267 increased burnout symptoms (14% vs. 6%, aOR 2.6). These associations were clearly more
268 pronounced when having reported accumulated experiences of workplace violence and/or
269 discrimination, i.e. more than one form. These most affected or exposed hospital employees
270 show almost consistently – although not always significantly – the highest prevalence rate and
271 relative risk for poor self-rated health (17%, aOR 1.6), strong sleep disorders (29%, aOR 3.1),
272 strong psychological stress (33%, aOR 3.4), being treated for a mental problem (12%, aOR 1.4)
273 or increased burnout symptoms (21%, aOR 4.1), compared to those who have not made any of
274 such experiences at all. The initially clear and statistically significant dose-response relationship
275 or gradient found for poor self-rated health in the simple model turned into a non-significant
276 association and a non-linear relationship in the extended model including the potentially
277 confounding variable of chronic disease. Only for having a mental problem, prevalence rates
278 and adjusted odds ratios as proxies for the relative risk were not significantly increased for the
279 most affected and exposed from the very beginning and in both models.

280 In other words, a strong association and clear and stable dose-response relationship was
281 observed between the number of experiences of workplace violence and/or discrimination and
282 three of the five studied health outcomes. And this relationship was not substantially
283 confounded by chronic disease (extended model) which in turn was found to be a strong and
284 significant risk factor of poor general and mental health outcomes itself.

285

286 **Table 2**

287 Associations between workplace violence and/or discrimination and health measures among
288 hospital employees (N = 1,567)

	Poor self-rated health			Strong sleep disorders			Strong psychological stress			Being treated for mental problem			Increased burnout symptoms		
	%	aOR ¹⁾	95% CI	%	aOR ¹⁾	95% CI	%	aOR ¹⁾	95% CI	%	aOR ¹⁾	95% CI	%	aOR ¹⁾	95% CI
Total study population	11.1			13.3			14.3			7.5			8.4		
MODEL 1 (simple)															
Workplace violence and/or discrimination															
None (0)	9.6	1		10.6	1		11.3	1		7.3	1		5.8	1	
One (1)	15.2	1.68*	1.10-2.56	18.6	1.92***	1.30-2.85	18.9	1.82**	1.22-2.71	5.8	0.79	0.42-1.46	14.4	2.71***	1.72-4.28
Accumulated (2+)	17.4	1.97**	1.23-3.16	28.5	3.36***	2.24-5.04	33.1	3.86***	2.60-5.75	11.8	1.71	0.98-2.96	21.1	4.33***	2.70-6.93
No. of cases in model	1,559			1,552			1,507			1,548			1,535		
MODEL 2 (extended)															
Workplace violence and/or discrimination															
None (0)	9.6	1		10.6	1		11.3	1		7.3	1		5.8	1	
One (1)	15.2	1.59	1.00-2.54	18.6	1.97***	1.31-2.95	18.9	1.74**	1.15-2.62	5.8	0.68	0.36-1.31	14.4	2.55***	1.60-4.07
Accumulated (2+)	17.4	1.57	0.93-2.64	28.5	3.11***	2.03-4.74	33.1	3.37***	2.23-5.08	11.8	1.44	0.81-2.56	21.1	4.11***	2.53-6.66
Chronic disease															
No	4.4	1		10.5	1		11.5	1		5.7	1		6.9	1	
Yes	29.8	9.54***	6.62-13.74	21.2	1.98***	1.44-2.72	22.8	2.05***	1.50-2.80	12.3	2.29***	1.54-3.40	12.7	1.87**	1.26-2.75
No. of cases in model	1,515			1,509			1,462			1,505			1,493		

289 *p<0.05, **p<0.01, ***p<0.001

290 ¹⁾Odds ratios adjusted for sex, age and education (control variables)

291 **Discussion**

292

293 One purpose of this study was to assess the frequency of workplace violence and discrimination
294 among hospital employees and particular health professions in a hospital setting in German-
295 speaking Switzerland. Almost every fourth (23%) of the study population reported at least one
296 form of discrimination or violence at work in the past 12 months before the survey, compared to
297 only every sixth (18%) in the entire working population of German-speaking Switzerland. With a
298 view to the occupational groups, nurses and midwives were most often affected by violence at
299 work, whereas physicians and other academics were most often affected by discrimination due
300 to nationality, ethnicity or skin color and particularly due to gender. The most frequent form of
301 violence among hospital employees was intimidation or mobbing (10%), whereas ageism was
302 the most commonly reported type of discrimination (5%).

303 Hence, the finding of a comparably high prevalence of workplace violence and discrimination in
304 hospital employees compared with the general working population is in accordance with
305 previous research, which has shown that health care workers are at special risk for workplace
306 violence, as they work with people who are in distress (6). Working in direct patient contact
307 means to be faced with people whose behavior can be affected by acute illness and pain,
308 psychiatric and neurological disorders, intoxications and substance abuse (6, 21). Nurses are at
309 particular risk, as this is usually the professional group temporally most exposed to patients
310 (22). There is also evidence that certain hospital units are more confronted with violence from
311 patients or visitors, such as emergency departments and psychiatric wards (23, 24). Intimidation
312 or mobbing in this study was found to be the most commonly reported form of workplace
313 violence and twice as often than in another study conducted in nursing homes in Switzerland,
314 which found a prevalence of mobbing in the past 6 months of nearly 5% among care workers
315 (25). Regarding ageism, earlier studies showed that discrimination on the grounds of being “too
316 young” is at least as common as on the grounds of being “too old” (26). Although employees of
317 these two age groups are confronted with different prejudices and potential occupational
318 disadvantages, there is evidence that ageism is associated with a lower level of affective

319 commitment in both of them (26). Another finding of this study is that gender discrimination is
320 most commonly reported among physicians and other academic staff. A possible explanation
321 might be that this form of discrimination is becoming increasingly important in employees with
322 higher education. Equal rights for women and men and gender equality is an important concern
323 in politics and policies since many years in Switzerland (27). However, with a look at the Gender
324 Monitoring Report from Swiss University faculties of medicine in 2014, there is still a
325 considerable gender gap in higher positions: While over 50% of medical graduates with a
326 master's degree are women, the proportion drops to 10% on full professor level (28).
327 With a look at the one-year prevalence of violence expected by health personal in an
328 international comparison, a very broad range can be observed, ranging from 3% (Portugal) to
329 17% (South Africa) for physical attacks, from 17% (Portugal) to 67% (Austria) for verbal
330 violence and from 11% (Australia) to 31% (Bulgaria) for mobbing (6). One reason for these
331 large differences between countries might be a limited comparability of the underlying studies,
332 for example in relation to the methodology (study design, definitions used), setting (differences
333 in health care systems, hospital versus outpatient sector, medical specialties), sample (personal
334 characteristics of the study population) and cultural peculiarities (including differences in
335 awareness and reporting systems).

336

337 Besides increased prevalence rates of specific forms of violence and/or discrimination at work
338 and/or among particular occupational groups, accumulated experiences of workplace violence
339 and/or discrimination among hospital employees and particularly health professionals were
340 found to be strongly associated with poor mental health outcomes such as strong sleep
341 disorders, strong stress feelings or increased burnout symptoms. The prevalence (or relative
342 frequency) and the odds or likelihood (or relative risk) of these poor health outcomes were
343 shown to gradually, substantially and significantly increase with the self-reported number of
344 experiences (0, 1, 2+) of violence and/or discrimination made at work, suggesting a dose-
345 response relationship. The strength of association and the clear dose-response relationship
346 across most studied outcomes are a good indication for a causal relationship.

347 This finding is in line with a series of earlier international studies and findings and particularly
348 supported by a systematic literature review from Canada published in 2013 on the
349 consequences of workplace violence among health care workers, showing a significant
350 association with psychological problems in 47 studies (13). The majority of the considered
351 studies reported symptoms of a posttraumatic stress disorder (such as intrusion, negative
352 changes in cognition or mood, changes in arousal and reactivity, sleep disturbances) and
353 depressive symptoms (13). Ten studies reported a negative effect on self-reported mental
354 health, while psychological distress was reported to be higher in five studies (13). A previous
355 study among Swiss nursing home care workers found a remarkably higher odds of health
356 complaints in those directly affected by mobbing (25). Another study on the consequences of
357 workplace violence among Chinese physicians showed a positive correlation with psychological
358 stress, and a negative association with subjective sleep quality and subjective health (29).
359 Partly in contrast to this Chinese study, we did not find a significant association of experienced
360 violence or discrimination at work with self-reported health, at least not after adjusting for
361 chronic disease. In other words: Although prevalence rates of poor self-rated health were
362 significantly increased among hospital employees who experience and report at least one form
363 of violence and/or discrimination at work, this was mainly due to their higher proportion of
364 chronically diseased who in turn showed an almost tenfold higher risk of being in poor general
365 and self-reported health than those without a chronic disease. Regarding the other studied poor
366 health outcomes, chronic disease not turned out to be an important confounder, as having a
367 chronic disease only about doubled (and not tenfold increased) the risk of having strong sleep
368 disorders, feeling strong psychological stress, being treated for a mental problem or showing
369 increased burnout symptoms. For these health measures, chronic disease only slightly
370 explained and therefore reduced the strong association found between workplace violence or
371 discrimination and poor health outcomes. But in case of poor self-rated health, a gradually and
372 significantly increased risk with the increasing number of experiences of violence and
373 discrimination at work turned out to be not statistically significant anymore when the association
374 was adjusted for chronic disease.

375 In sum – it is not really surprising but at the same time has not been shown before at least for
376 health care workers in Switzerland – we found that accumulated experiences of violence and
377 discrimination at work are a strong stressor and risk factor for sleep disorders, psychological
378 stress and burnout, even though it does not seem to cause severe mental problems.

379
380 Burnout symptoms in health care workers are very common. A meta-analysis among medical
381 and surgical residents estimates its global prevalence to be around 51% (30). Burnout is a
382 psychological syndrome, which can be regarded as a prolonged result to chronic stressors at
383 work, consisting of three different domains, namely emotional exhaustion, depersonalization
384 and low personal achievement (31). It seems to be more prevalent in professions comprising an
385 intensive work with other people, such as care giving or teaching roles (31). As burnout in
386 health care staff is associated with higher costs and major medical errors (32), studies
387 investigating its risk factors are numerous. Previous studies suggest that mistreatment of health
388 care professionals (including harassment, bullying, discrimination and physical violence)
389 contribute to the development of burnout symptoms in this population (33-35). However, there is
390 a broad range of other factors related to health care organizations and systems as well as
391 individual characteristics knowing to play an important role in the development of or protection
392 from burnout symptoms (36).

393

394 **Limitations**

395 This study has some limitations that have to be considered with regard to the study results:
396 First, the study is based on cross-sectional data, which do not allow to test for causality.
397 Moreover, reverse causality cannot be excluded either. For instance, a high level of stress can
398 trigger unsocial behavior towards colleagues or impatient behavior towards patients, which
399 themselves could increase the risk of discriminating statements from colleagues or aggressive
400 behavior in patients. This raises the question whether psychological stress is a consequence of
401 discrimination or violence experiences or if a high stress level could also be the starting point of
402 a vicious circle ending in violence or discrimination experiences.

403 Secondly, the question measuring experiences of workplace violence or discrimination did not
404 distinguish between internal and external violence and did not assess the true extent of the
405 experiences, which would have been helpful for a more accurate estimation of the exposure or
406 strain and for the interpretation of the results. Additionally, there is a risk for potential recall bias,
407 as the question on experienced violence and discrimination refers to a period of 12 months
408 before completion of the questionnaire.

409 In view of the described overall response rate of around 41%, there is a risk for potential
410 selection bias (non-response bias). Also, as participants were allowed to complete the
411 questionnaire during working time, a potential response bias should be taken into account, as
412 people could have answered in a way they considered to be desirable by their company.

413

414 **Conclusions**

415

416 Having in mind the negative consequences of workplace violence and discrimination on mental
417 health, the present study underlines the importance of an active combat against these
418 undesired but still common behaviors in the health care setting. Managing violence and
419 discrimination at workplace is a challenging task not only for clinical practice, but also for health
420 policy, requiring a holistic approach according to the complexity of these phenomenon.

421 Therefore, prevention and dealing strategies in hospitals should not only focus on organizational
422 factors, but also on the level of the individual employees and their interactions. With regard to
423 the latter, previous studies suggest to provide training programs for health care workers, for
424 example in communication skills (37). With regard to organizational factors in hospitals, the
425 development of a no-tolerance policy or environmental changes improving the safety (e.g. the
426 presence of security systems) are some examples which are assumed to limit workplace
427 violence (21). However, another important issue is the way how to handle discrimination or
428 violence experiences that have already taken place, in a way that minimizes its negative
429 consequences on the victims. For example, Schat and Kelloway found that social support from
430 colleagues and supervisors is able to buffer the negative consequence of workplace

431 violence/aggression on physical and psychological health as well as working attitudes in health
432 care employees (38).

433
434 The comparably high prevalence of violence and discrimination among hospital staff and
435 particularly among health professionals and its significant association with sleep disorders,
436 stress feelings and burnout symptoms underline the importance of an active combat against
437 these behaviors in health care. Strategies to prevent violence should primarily focus on nurses
438 and midwives, which have been identified as the most affected professional group of hospital
439 employees in this study.

440

441 **List of abbreviations**

442

443	aOR	adjusted odds ratio
444	CBI	Copenhagen Burnout Inventory
445	CI	95% Confidence Interval
446	FOPH	Federal Office of Public Health
447	ILO	International Labour Organization
448	SECO	State Secretariat of Economic Affairs
449	SRH	Self-rated health
450	SUVA	Swiss National Accident Insurance Fund

451

452 **Declarations**

453

454 **Ethics approval and consent to participate**

455 This study is observational and not clinical or experimental. Self-reported data used were
456 collected from hospitals and rehabilitation clinics, but survey respondents were employees and
457 not patients. Furthermore, participation in the survey was voluntary and anonymous.
458 Participants were not asked for their name nor for their exact age, which does not allow to draw

459 conclusions on their identity. For all these reasons, informed and explicit consent from
460 respondents was not needed or obtained but implicitly given by participating voluntarily in the
461 survey.

462 The study and survey were carried out in accordance with the Declaration of Helsinki. The study
463 was exempted from requiring ethical approval because the used data do not fall within the
464 scope of the Swiss Federal Act on Research involving Human Beings whose purpose is to
465 protect the dignity, privacy and health of human beings involved in research. This so-called
466 Human Research Act (HRA) explicitly declares in Art. 2 that it does NOT apply to research
467 which involves anonymously collected or subsequently anonymized health-related data. Since
468 the data used were no register data and did not involve medical records or human tissues from
469 patients but instead were self-reports from employees and collected completely anonymously,
470 so that they cannot be traced to a specific person, no formal approval or authorization of the
471 study is required or will be issued, neither by the cantonal ethics committees nor by the cantonal
472 commissioners for data protection. This is not even recommended by the medical-ethical
473 guidelines for scientific integrity of the Central Ethics Committee and the Swiss Academies of
474 Sciences.

475

476 **Consent for publication**

477 This manuscript does not include details, images, or videos relating to an individual person,
478 therefore no written informed consent for the publication of these details must be obtained from
479 the study participants.

480

481 **Availability of data and materials**

482 Individual data were collected by random and full sample surveys among the workforces of
483 several public hospitals and rehabilitation clinics. Data were collected anonymously and on a
484 voluntary basis. However, data are not publicly accessible and freely available since the use
485 and analysis of the pooled data and the publication of any research findings and study results
486 out of it are restricted by contract with the participating companies (hospitals, clinics) to the

487 University of Zurich (Epidemiology, Biostatistics and Prevention Institute) and the collaborating
488 Careum Research, a division of the Careum Foundation. As contracted, the use of the data is
489 basically limited to the two research institutions and disclosure and delivery of the data therefore
490 is not permitted. In order to get an exceptional permission and possible conditional access to
491 the survey data for scientific purposes the corresponding author as the principal investigator
492 and the responsible for the data collection needs to be contacted.

493

494 **Competing interests**

495 The authors declare that there are no competing interests.

496

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500

501 **Authors' contributions**

502 ASG drafted the raw version of the manuscript and contributed to the statistical analysis of the
503 data. OH collected and analyzed the data and revised the manuscript. Both authors equally
504 conceptualized the study and interpreted the findings, and read and approved the final
505 manuscript.

506

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509 **References**

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