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The mental health of female sex workers

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Objective: There is limited information available about the mental health of female sex workers. Therefore, we aimed to make a comprehensive assessment of the mental status of female sex workers over different outdoors and indoors work settings and nationalities.
Method: As the prerequisites of a probability sampling were not given, a quota-sampling strategy was the best possible alternative. Sex workers were contacted at different locations in the city of Zurich. They were interviewed with a computerized version of the World Health Organization Composite International Diagnostic Interview. Additional information was assessed in a structured face-to-face interview.
Results: The 193 interviewed female sex workers displayed high rates of mental disorders. These mental disorders were related to violence and the subjectively perceived burden of sex work.
Conclusion: Sex work is a major public health problem. It has many faces, but ill mental health of sex workers is primarily related to different forms of violence.

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Key words: prostitution; mental disorders; depression; anxiety; epidemiology

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Significant outcomes

- We found high rates of mental disorders among female sex workers. In particular 1-year prevalence rates were high what points to the immediate burden associated with sex work.
- It is essential to consider the heterogeneity of female sex work. Work setting and nationality characterize different groups of sex workers concerning rates of mental disorders.
- As has been shown by other studies, female sex workers frequently are exposed to high levels of violence. Violence proved to be an important correlate of mental disorders.

Limitations

- Women who were forced to sex work and women who were working illegally were probably underrepresented in our study.
- The DIA-X does not assess adjustment disorders and personality disorders, which might be quite prevalent in female sex workers.
- As our study was cross-sectional, we were not able to discuss the issue of causality, e.g. if mental disorders precede sex work or are a consequence thereof.

Introduction

Women experience higher rates of depression and anxiety in the general population (1). Some researchers linked increased anxiety or depression rates of women to health damaging psychosocial factors like high job demands and low decision latitude in work (2, 3).

As a marginalized group, sex workers are normally expected to experience poorer health than comparable age groups of the general population. But because of the quasi-legal or illegal and stigmatizing character of sex work, sex workers do not fit into the public health framework of occupational health (4), although there is a growing demand for both legal and illegal sex work. For example in the United Kingdom, where sex work is illegal, the proportion of men who reported paying for sex doubled in the decade from 1990 to 2000 (5).

Given that public health is more concerned with the health of customers of sex workers, public health actions almost exclusively focus on risks associated with transmittable infectious diseases like human immunodeficiency virus/acquired immune deficiency syndrome rather than on health questions in general or in particular on the mental health consequences of sex work. But across all topics, articles expressing opinions or stereotypes about sex work seem to outweigh research articles (6). Rigorous research is therefore needed to understand the precise context of sex work (7, 8).

Studies dealing with the mental health of female sex workers are rare (9). The few available studies either concentrate on certain disorders like post-traumatic stress disorders (PTSD) (10, 11), depression (12), or drug use (13–16), do not use diagnostic criteria (17, 18), deal exclusively with selected work settings like outdoors sex work (16, 19), or are predominantly concerned with violence by customers towards female sex workers (20), or youth sex work (21, 22).

Aims of the study

Our study aims to make a standardized assessment of the mental health of female sex workers over different work settings and nationalities and identify correlates of their potentially ill mental health. We aim to compare rates of mental disorders in adult female sex workers to the rates in female subjects of the general population as assessed in epidemiological studies. Moreover, we examine the association of ill mental health of adult female sex workers with their working conditions, and with other factors as nationality and social support.

Materials and methods

Participants

According to the Zurich Police Department, 3581 sex workers were registered in the city in 2004 and 3990 in 2005 [excerpt from the City Council Meeting (GR Nr. 2005/314)]. These are approximate numbers because of an unknown number of illegal sex workers in the city. According to the Police Department, the estimated number of illegal sex workers was around 500 persons in 2005. As sex work itself is not illegal in Switzerland, illegality refers to certain conditions of sex work, mainly not having a permission to engage in gainful occupation, being forced to offer sex services or being underage. Finally, there is an unknown number of registered sex workers who no longer work as sex workers.

As the basic population parameters were not clearly defined [sex workers constitute an open, mobile and predominantly invisible group (23)], it is not possible to draw a random, probabilistic sample from this population. Furthermore, the expected response rate of this population is detrimental to the quality of a representative sample because the probability of not responding to such a survey is presumably not randomly distributed. For those reasons the prerequisites of drawing a random sample were not given. A non-proportional quota-sampling approach was the best possible alternative. In this method, the major characteristics of a population are specified as sampling categories. The size of each category does not necessarily match the proportions in the population, but should assure that smaller groups are adequately represented in the sample. Categories chosen as risk factors for ill mental health were 'setting of sex work' and 'nationality' (Swiss, Europeans and non-Europeans). For legal reasons we did not include female sex workers under the age of 16 years.

To secure a broad participation, we directly contacted female sex workers in different locations, namely outdoors, in studios, bars, cabarets, parlours, brothels and escort services. We also distributed flyers in these locations to campaign for the study. On the other hand we asked the respective information and facilitation centres for sex workers and services for the homeless for assistance in recruiting the participants of the study. With respect to escort services, we also answered the respective sex work newspaper or internet contact advertisement. Finally, we contacted all female students at the University via mail with the permission of the Legal Department of the University and asked for their participation in case they are engaged with sex work. We communicated at all occasions that we would conduct the interviews in German, Spanish, Portuguese or English. Informed written consent was necessary to participate in this study. The participants received a lump compensation for their expenditures. The Local Ethic Committee approved the study.

Instruments

We assessed the mental health status with the World Health Organization (WHO) Composite International Diagnostic Interview (M-CIDI 2.1). The fully standardized CIDI is a computerized interview developed by the WHO for use in epidemiological surveys. In our study we used the

German version of the CIDI 2.1, DIA-X (24). The CIDI enables trained non-clinicians to assess lifetime and current diagnoses of mental disorders in accordance with the diagnostic and statistical manual (DSM)-IV (25) criteria. The CIDI has been used worldwide in numerous epidemiological studies and has also been explored psychometrically in a large number of studies. The inter-rater reliability of the CIDI was found to be excellent (25). The three female interviewers of our study (all clinical psychologists or psychiatrists) were trained for the CIDI interview by a WHO-authorized trainer.

Socio-demographical data, questions regarding working conditions (income, expenditures, number of working days and of customers per week) and motivation for sex work were assessed in a structured interview. Subjectively experienced burden associated with sex work was measured by 15 questions which were summed up to one scale (alpha = 0.85) representing the overall burden associated with sex work. We excluded the question 'To what extent are you affected by illegality, fear of being caught by the police?' from the scale to enhance internal consistency. Two items measuring stigma were summed up to one scale (alpha = 0.86). The total face-to-face interview took 90–120 min. The interviews were conducted in 2004 and 2005.

Statistical analysis

The DSM-IV diagnoses were calculated automatically by the computerized DIA-X interview. Before conducting cluster analyses, associated variables were determined using logistic regressions. Dependent variable was the 1-year prevalence rate to ensure that analyses refer to the current state of the mental health of sex workers. Logistic regressions were calculated with SPSS 13.0 for Windows. Variables with more than five missing cases were excluded *a priori*. Also the inclusion of highly correlated items measuring nearly similar aspects was avoided.

Cluster analysis aims to differentiate mutually exclusive groups of respondents characterized by similar patterns of scores on several variables. Latent cluster analysis postulates an underlying latent variable that is responsible for the clusters, and is suited for categorical data. Latent Gold 4.5 (Statistical Innovations Inc., Belmont, MA, USA) allows for mixed model cluster solutions (26). To account for sparse data, the model fit was tested using the BOOTSTRAPPING algorithm of Latent Gold 4.5. To select the appropriate number of clusters the Baiesian Information Criterion (BIC) was used.

In logistic regressions and cluster analyses, cases with missing values were excluded (listwise deletion). Per cent indicated in text and tables are always calculated based on all non-missing observations. Varying denominators may therefore lead to small inconsistencies. Confidence intervals (CI) for proportions were calculated according to the Adjusted Wald method (27), as the number of positive cases was small for several diagnoses.

Results

Interviews were conducted with 193 female sex workers. This is an approximation of 5% of all registered female sex workers in the city of Zurich. The age of the interviewed women ranged from 18 to 63 years and the mean age was 32.1 years (Table 1). The majority were Swiss born persons (53.4%), and two-thirds of the sample possessed a Swiss passport (62.2%).

Two-thirds of the women had a typical school education for their respective country, only a

Table 1. Socio-demographical data of the female sex workers and indicators of social integration

	Per cent/mean (range)	*n*
Age (mean)	32.1 (18–63)	193
Nationality		193
Swiss	53.4	103
West European	18.1	35
East European	9.3	18
Latin American	13.5	26
Asian	4.7	9
African	1.0	2
Residence permit		193
Swiss passport	62.2	120
Permanent residence permit	16.1	31
Residence permit 5 years	11.4	22
Short term residence permit	4.1	8
'Sans papiers'	2.6	5
Tourist	2.1	4
Education		193
Typical	63.2	122
Higher school diploma	15.5	30
University training	5.7	11
No school education	6.7	13
Other	8.8	17
Partner		193
Yes	51.8	100
Children		192
Yes	37.3	72
Supported by family		193
Yes	77.7	150
Someone to thrust		193
Yes	74.1	143
Felt excluded by circle of acquaintances		193
Sometimes or more	58.5	113
Felt excluded by society		193
Sometimes or more	61.7	119

minority had no school education at all (Table 1). Of the women living in a partnership, 80.0% had informed their partners about their profession and 12.0% shared their income from sex work with their partners.

Social support

The majority of the women had either a person to trust or felt supported by the family. More than half of the sex workers felt at least sometimes excluded from their circle of acquaintances because of their profession, and as many felt excluded from society (Table 1).

Reasons for doing sex work

Many reasons for doing sex work were reported. Near to 40% of the women declared to like their work. Other prominent reasons were not being able to find another job, the need to give financial support to families, paying debts and buying drugs (Table 2). Out of the sample of our study, only 1.6% actually stated to be forced to do sex work (Table 2), while 10.9% announced that they previously had been forced to do sex work. Some women (4.1%) had been deceived about the kind of work they were supposed to do (mainly when they came from abroad). Of the female sex workers with a foreign nationality, 1.9% had to pay up to 19 000 Euro to an agent as commission.

Work setting and working conditions

The interviewed women started to work in the sex business on average at the age of 24 (Table 2). More than one-third (36.8%) worked at more than one location. Nearly one-third offered their services outdoors (street or car) (Table 2). Of the women offering their services outdoors, 25.3% did so for the provision of drugs.

The interviewed women worked on average more than 4 days per week. They serve on average 13.5 customers weekly or on a yearly basis, 702 customers. Extrapolating this number on the basis of the number of registered sex workers, there were roughly between 2.5 million (in 2004) and 2.8 million (in 2005) occasions per year that men chose the services of female sex workers in the city of Zurich. The average income of more than 1000 Euro per week was comparably high compared with the average monthly income of 3600 Euro of Swiss and foreign residents in 2004 (Swiss Federal Statistical Office). But only one-third of the sex workers could dispose of the full amount, and one-third had only up to 60% of the full amount at one's disposal.

Table 2. Work setting, working conditions and motivation for sex work

	Per cent/mean (range)	*n*
Age at first sex work (mean)	23.9 (12–52)	193
Working days per week (mean)	4.3 (1–7)	191
Customers per week (mean)	13.5 (1–60)	186
Income in euro (mean)	1172 (93–6262)	180
Per cent of income at own disposal (mean)	76.5 (0–100)	179
Auxiliary income		193
Yes	29.5	57
Workplace		
Studio		193
Yes	38.3	74
Parlour		193
Yes	31.6	61
Brothel		193
Yes	4.7	9
Cabaret		193
Yes	3.1	6
Escort service		193
Yes	20.7	40
Street		193
Yes	25.4	49
Car (own or of customers)		193
Yes	23.8	46
Wish to quit		193
Yes	55.4	107
Violence in red-light milieu		
Rape	19.7	193
Yes		38
Pressure	31.4	191
Yes		60
Violence	25.9	193
Yes		50
Violence out of red-light milieu		
Rape		193
Yes	30.6	59
Pressure		191
Yes	27.2	52
Violence		193
Yes	40.4	78
Reasons for doing sex work		193*
Liking the job	37.3†	72
Not being able to find another job	28.5	55
Supporting family financially	26.4	51
Paying debts	24.4	47
Buying drugs	22.3	43
Financing a professional education	8.3	16
Helping the partner	5.7	11
Being forced to do sex work	1.6	3

*n = 191 for 'liking the job'.
†Per cent of positive answers (yes); multiple responses were possible.

Negative and positive aspects of sex work

Negative aspects the women mostly mentioned (answers: 'strongly affected' and 'very strongly affected') were being financially dependent (46.6%), fear of infection (44.6%), leading a double life (40.4%), problems with intimate relationships (40.9%), customers' demands (35.2%), sexual problems (33.7%), sex work *per se* (33.8%),

shame and feelings of guilt (30.7%), or working conditions (30.5%). Positive aspects were money (97.9%), being independent (60.6%), being able 'to help others' (38.9%), to arrange something according to one's owns ideas (36.8%), more self-confidence (34.7%) and 'power' (31.6%). Multiple answers were possible.

Rates of mental disorders

Lifetime prevalence rates as well as 1-year prevalence rates of mental disorders are indicated in Table 3. The ratio of 1-year prevalence to lifetime prevalence is nearly 1 : 1 in the sample of sex workers.

Logistic regressions

Logistic regression analyses identified the following correlates of 1-year prevalence rates of mental disorders: cultural background, work setting, subjectively perceived and objectively experienced burden associated with sex work and subjectively perceived social support (Table 4).

Cluster analyses

Cluster analyses built on the relevant explaining variables selected by logistic regressions. As most women worked in more than one setting, variables on *work setting* were included in cluster analysis despite bivariate non-significance. We choose the variable 'sex work as auxiliary income' to represent *workload* because of the lowest number of missing values. Moreover, the more easily interpretable variable 'someone to thrust' was preferred over the more significant variable 'supported by the family', as both variables had the same effect in the cluster model. Significant variables representing more general constructs as stigmatization were not included in cluster analyses.

Following the BIC criterion, a solution with four clusters was the most parsimonious. The first cluster ($n = 66$) encompasses mostly Swiss full-time sex workers working outdoors. They experience more violence and rape outside of the red-light milieu than in the milieu itself. The second cluster ($n = 53$) comprises women working in brothels, salons, or cabarets. They are of unspecific cultural background, mostly work full time, and do not experience much violence from sex work itself. Women of the third cluster ($n = 42$) are of mixed European origin, work mostly in studios, and experience little burden by sex work. The fourth cluster ($n = 30$) consists of mostly non-European women working mainly in studios. They experience the highest violence in the milieu and the highest burden (Fig. 1).

The four clusters differ concerning the rates of mental disorders. Cluster 4 displays the highest

Table 3. Diagnoses of different psychiatric disorders, comparison of 1-year and lifetime prevalences in the assessed sex workers (total $n = 193$)

	One-year prevalence			Lifetime prevalence		
	Per cent	95% CI*	*n*	Per cent	95% CI	*n*
All disorders	50.3	±7.0	97	63.2	±6.8	122
Schizophrenia	0	–	0	0	–	0
Mood disorders	30.1	±6.4	58	41.5	±6.9	80
Major depression	24.4	±6.0	47	36.3	±6.7	70
Dysthymia	11.9	±4.7	23	12.4	±4.7	24
Bipolar disorders	0.5	±1.0	1	0.5	±1.0	1
Anxiety disorders	33.7	±6.6	65	34.2	±6.6	66
Generalized Anxiety	5.2	±3.3	10	7.3	±3.8	14
Panic disorder	8.8	±4.1	17	11.4	±4.6	22
Simple phobia	17.6	±5.4	34	18.7	±5.5	36
Social phobia	7.3	±3.8	14	7.3	±3.8	14
Agoraphobia without panic	2.1	±2.0	4	3.1	±2.8	6
Anxiety disorder NOS†	1.0	±2.0	2	2.1	±2.4	4
Obsessive compulsive	2.1	±2.4	4	2.1	±2.4	4
Eating disorders	5.2	±3.3	10	8.8	±4.1	17
PTSD	13.0	±4.8	25	21.2	±5.8	41
Somatoform disorders	10.4	±4.4	20	11.4	±4.6	22
Alcohol dependency	0	–	0	0.5	±1.0	1
Psychotic disorder GMC‡	1.0	±2.0	2	2.6	±2.6	5
Anxiety disorder GMC	0.5	±1.0	1	0.5	±1.0	1
No diagnosis	49.7	±7.0	96	36.8	±6.8	71

PTSD, post-traumatic stress disorder.
*95% Confidence interval of per cent [adjusted Wald (27)].
†Not otherwise specified.
‡As a result of general medical condition.

Table 4. Bivariate logistic regressions for different covariates (independent variables) of diagnosis of any psychiatric disorder (dependent variable) in the past 12 months assessed by the Composite International Diagnostic Interview in female sex workers. Bold figures indicate statistical significance (*P*-value < 0.05) (total *n* = 193)

	n (yes/no)	OR (95% CI)	*P*-value
Age	193	0.99 (0.95–1.02)	0.380
Residence permit	193		
Swiss passport	120	–	0.874
Permanent residence permit	31	1.26 (0.57–2.77)	0.574
Residence permit 5 years	22	1.24 (0.50–3.09)	0.643
Other	20	0.85 (0.33–2.19)	0.730
Education	193		
Typical	122	–	0.129
Other	17	0.27 (0.07–1.04)	0.056
High school/university training	41	0.38 (0.09–1.60)	0.189
No school education	13	0.16 (0.03–83)	**0.029**
Nationality	193		
Switzerland	103	–	**0.001**
Western Europe	35	0.55 (0.25–1.23)	0.146
Eastern Europe	18	0.53 (0.19–1.52)	0.238
Other countries	37	3.84 (1.61–9.20)	**0.003**
Partner (193, yes)	193 (100/93)	0.90 (0.51–1.59)	0.717
Children (192, yes)	192 (72/120)	1.20 (0.67–2.15)	0.551
No one to thrust (193, yes)	193 (143/50)	2.13 (1.10–4.15)	**0.025**
Supported by family (193, yes)	192 (93/150)	0.23 (0.10–0.49)	**0.000**
Felt excluded by acquaintances (193)			
Sometimes or more	193 (113/80)	3.20 (1.76–5.82)	**0.000**
Felt excluded by society (193)			
Sometimes or more	193 (119/74)	3.65 (1.97–6.75)	**0.000**
Age at first sex work (193)	193	1.00 (0.96–1.04)	0.922
Working days per week (191)	191	1.25 (1.04–1.50)	**0.016**
Customers per week (186)	186	1.04 (1.01–1.07)	**0.022**
Income (180)	180	1.00 (1.00–1.00)	0.326
Per cent of income at own disposal (179)	179	1.01 (0.99–1.02)	0.405
Auxiliary income (193, yes)	193 (57/136)	0.37 (0.20–0.71)	**0.003**
Workplace			
Street/car	193 (74/119)	0.90 (0.50–1.61)	0.724
Brothel/salon/cabaret	193 (66/127)	1.08 (0.60–1.96)	0.801
Escort service/hotel	193 (45/148)	1.05 (0.54–2.04)	0.896
Studio	193 (59/134)	1.39 (0.75–2.57)	0.296
Violence			
Pressure in red-light milieu (191)	191 (60/131)	1.23 (0.67–2.28)	0.502
Violence in red-light milieu (193)	193 (50/143)	3.05 (1.53–6.07)	**0.002**
Rape in red-light milieu (193)	193 (38/155)	2.22 (1.06–4.65)	**0.035**
Pressure out of red-light milieu (191)	191 (52/193)	1.40 (0.74–2.65)	0.309
Violence out of red-light milieu (193)	193 (78/115)	1.51 (0.85–2.70)	0.160
Rape out of red-light milieu (193)	193 (59/134)	2.07 (1.11–3.89)	**0.023**
Burden by sex work (193)			
Sum score	193	6.41 (3.44–11.94)	**0.000**

rates of all diagnoses (90.0%), anxiety disorders (73.3%), depression (46.7%) and PTSD (40.0%) (Fig. 2). Depression is also quite salient in cluster 1 (45.5%), which encompasses women working outdoors. Cluster 3 represents relatively healthy women. In this group, depression is the most frequent disorder (9.5%).

Discussion

To the best of our knowledge this is the biggest sample of female sex workers, which has been assessed with a structured interview concerning mental health in a diversity of work settings and over different nationalities. As it is not possible to draw a random sample from such an open, mobile and at its borders vaguely defined group, the chosen sampling procedure comes the closest to a representative sample.

Strengths and limitations

One of the limitations of the study is the presumed under-representation of illegal female sex workers. The per cent of illegal sex work from the total number is probably around 10–12%. We assume that we assessed a rate of illegal sex work around 5% just including the women who counted to the group of 'sans papiers' or women who are offering their services with a tourist visa. This refers in the first place to women from Eastern Europe whose number has increased rapidly during the last years.

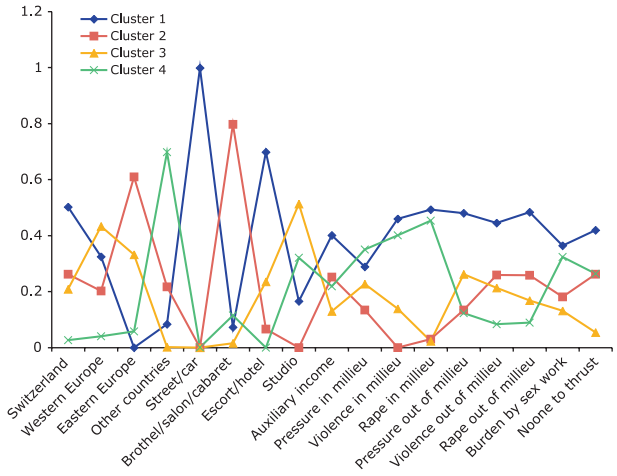

Fig. 1. Cluster solution of selected explaining variables. Lines represent (partial) conditional probabilities that show how the clusters/factor levels/classes are related to the indicator variables. The probabilities within each cluster sum to 1. n (total) = 191. n (cluster 1) = 66, n (cluster 2) = 53, n (cluster 3) = 42, n (cluster 4) = 30.

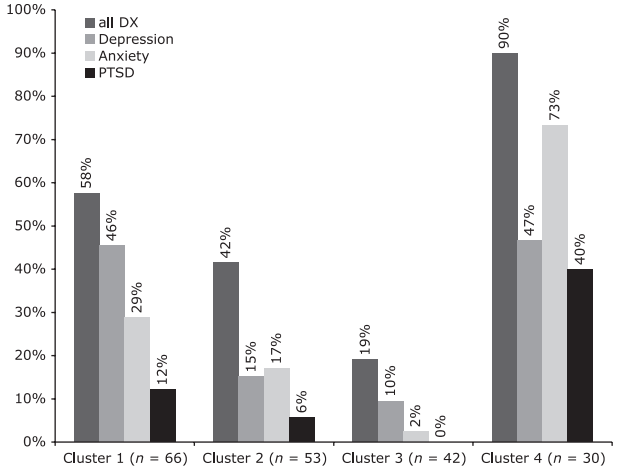

Fig. 2. Per cent of all 1-year diagnoses (all DX), all 1-year depression diagnoses, all 1-year anxiety diagnoses and all 1-year diagnoses of post-traumatic stress disorder in different groups of sex workers identified by cluster solution (total n = 191).

Moreover, we failed to reach women who did not speak any of the interview languages, among others women from Eastern Europe, Africa and Asia. For legal reasons we also did not include women under the age of 16 years. But as none of the participating sex workers was under 18 years, our study only refers to adult female sex workers. Last but not least, we did not have access to female sex workers who are forced in a strict sense to do sex work. Thus, the extent of violence experienced by some of these women is presumably underestimated. For all those reasons our study is not representative insofar as the participants do not exactly mirror the composition of the total group of female sex workers. But the broad range of sex workers included gives a good picture of sex work in different work settings and the burden associated with sex work. The study also allows the conclusion that there is a clear relationship between the mental health of sex workers and their working conditions.

Heterogeneity as a main characteristic

Female sex workers are not a homogenous group. The age range is remarkable as well as the range at what age these women had started with sex work. But in principle these women are not uneducated. Two-thirds have a typical school education for their respective country and about 6% even a university training. They come from different (cultural) backgrounds and offer sex services for different reasons. It is self-evident that financial reasons for sex work are most prominent. But surprisingly near to 40% indicate that they like this kind of work. About one-third of the women are offering sex services for altruistic reasons, as they want to help. Thus, sex work obviously also serves very personal reasons; sex work can enhance self-esteem, allow the person to be their own master or give a feeling of power. However, there is also a considerable proportion of sex workers who did not choose this job voluntarily. Only few were directly forced into sex work. But there are other ways to force the women into sex work: coming mostly from abroad, they were deceived about the nature of their work they were coming for or they were put in debt thus creating an artificial dependency.

Nationality and work setting characterize different groups

A logistic regression and subsequently a cluster analysis allowed us to identify the most prevalent correlates with ill mental health and to group the sex workers in different 'risk' cluster. The group of female sex workers can be divided in four clusters, being active in different settings and from different nationalities. The third relevant variable characterizing the various cluster, is the violence experienced by those women in and apart from the setting they work in. As such (European) female sex workers from escort services with a few clients per week are hard to compare with (mostly Swiss) female sex workers who work outdoors serving dozens of clients during a week with the objective to secure the provision of drugs. But obviously the most burdened group includes predominantly women from non-European countries who experi-

ence violence in and apart from their sex work setting.

High rates of mental disorders among sex workers

How should we classify the high rates of mental disorders among female sex workers? Compared with rates of women from the European ESEMeD Study (28) using CIDI 3.0 [1-year prevalence any disorder: 12.0% (95% CI: 11.2–12.8), mood disorders: 5.6% (95% CI: 5.1–6.1), anxiety disorders: 8.7% (95% CI: 8.0–9.4)] the rates found in our study [1-year prevalence any disorder: 50.3% (43.3–57.2); mood disorders: 30.1% (24.0–36.9); anxiety disorders: 33.7% (27.4–40.6)] are very high. Also the only Swiss population study (29) using the CIDI (core version 1.0) had considerable lower 1-year rates of major depression [DSM-III-R: 9.2% (95% CI: 6.2–13.4)] than our sample of sex workers [DSM-IV: 24.4% (95% CI: 18.8–30.9)]. This is not quite the case if we compare these rates with the rates from the Zurich study. The DSM-III-R lifetime prevalence rates for women between 20 and 40 years of age concerning mood disorders are 29.8% (95% CI: 22.3–37.3) and concerning anxiety disorders 33.6% (95% CI: 26.3–41.8) in the Zurich study (1) compared with 41.5% (95% CI: 34.7–48.5) concerning mood disorders and concerning anxiety disorders 34.2% (95% CI: 27.9–41.2) DSM-IV diagnoses in our study. But the Zurich study did not include migrants; in some migrant populations, rates of mental disorders and symptoms are higher (30–33). Moreover, the Zurich study did not use the CIDI. As the use of different diagnostic instruments often results in divergent prevalent estimates (34, 35), we do not know which proportion of the differences or similarities in prevalences is explained by the interviews used. Another explanation for equally high rates in the Zurich study and the sample of sex workers may be the prospective instead of retrospective assessment used by the Zurich study, which usually results in higher prevalence rates (36). If adjustment disorders were included in the CIDI, rates of mental disorders probably would even have been higher in our sample, as female sex workers are exposed to psychosocial stressors that are causes for adjustment disorders (37). Moreover, personality disorders which are also missing in the CIDI might as well be more prevalent in sex workers.

Correlates of ill mental health among sex workers

Nonetheless the rates are high. Concerning the lifetime rates, we have to discuss if women with pre-existing mental disorders are more predisposed to get involved in sex work. But the ratio of lifetime prevalence rates and the 1-year prevalence rates rather indicate a reverse effect: This ratio in our study is almost 1 : 1 suggesting that the burden of sex work during the last year impacts on the women' mental health to an extent comparable to the rates developed during their whole previous lives. This indicates how burdensome sex work actually is.

There is no doubt that the work conditions of sex work have a significant impact on the mental health of the involved women. As such, subjectively experienced social support is correlated with lower rates of mental disorders. Higher rates of mental disorders, however, are related to the subjectively perceived burden associated with that kind of work. Objectively, it is open violence in and apart from the work setting, which also significantly impacts on these women's mental health. Violence in many forms towards sex workers is a known problem internationally (16, 20, 38–40). But the factors correlated with an increase in mental disorders are not evenly distributed over different work settings and nationalities: mental disorders are especially prevalent among Swiss women, who are addicted and work on the streets, and the above mentioned group of Non-Europeans who are victims of open violence in particular in but also apart from their sex work setting. Thus, indoor sex work is not generally associated with more safety (41). We assume that women coming from abroad are more vulnerable for negative effects of sex work – and thus for consecutive mental problems – because they lack important resources: Language skills to deal with customers, a reliable social network to receive help and support, and knowledge of the legal and welfare system. Furthermore, they often may have debts and cannot afford to reject customers. Also a history of abuse or coming from a country where women are suppressed can possibly impede on their capacity of defending themselves against (sexual) assaults. This may in turn encourage customers to behave abusively or may attract potentially abusive customers. Another topic is that people with mental disorders are at higher risk for violence (42), therefore, a vicious circle between violence and ill mental health is established.

How to improve the mental health of sex workers

Summarizing our results, we can say that our hypotheses became confirmed. Undoubtedly, there are higher rates of mental disorders in adult female sex workers compared with the general population. Ill mental health of adult female sex workers is associated with their working conditions: respec-

tively the setting they work in, and ill mental health is more prevalent among adult female sex workers with a foreign nationality, in particular with a non-European nationality.

Do our results allow some preliminary considerations for the occupational health of sex workers? The demand for the services of sex workers is startling when we consider the extrapolated numbers of men using sex services in Zurich. But this is surely not an isolated problem in Zurich. Sex work is a major public health problem worldwide. It has many faces, but ill mental health of sex workers is primarily related to different forms of violence as experienced by those women. Legalizing sex work does not solve this problem as can be seen from our study in Switzerland where sex work is legal, but it is a prerequisite to take action against violence towards sex workers (43). It would be worthwhile to investigate the impact of jurisdiction on sex work in countries where buying sex but not offering sex is illegal as in Sweden, or where buying sex is prohibited under certain conditions like in Finland.

But first of all, there is an urgent need to secure the environment of female sex workers much more intensively. This could be performed by securing the physical environment as well as by several legal and administrative measures. But as the group of sex workers is very heterogeneous, the factors of burden contributing to ill mental health have also to be identified individually and improved. As social support positively influences on their mental health, it becomes evident that a lot can be performed for these women through professional support.

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