Association of work related chronic stressors and psychiatric symptoms in a Swiss sample of police officers; a cross sectional questionnaire study

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Abstract

Purpose: (1) to identify work related stressors that are associated with psychiatric symptoms in a Swiss sample of policemen and (2) to develop a model for identifying officers at risk for developing mental health problems.

Method: The study design is cross sectional. A total of 354 male police officers answered a questionnaire assessing a wide spectrum of work related stressors. Psychiatric symptoms were assessed using the "TST questionnaire" (Langner, 1962). Logistic regression with backward procedure was used to identify a set of variables collectively associated with high scores for psychiatric symptoms.

Results: A total of 42 (11.9%) officers had a high score for psychiatric symptoms. Nearly all potential stressors considered were significantly associated (at P<.05) with a high score for psychiatric symptoms. A significant model including 6 independent variables was identified: lack of support from superior and organization OR= 3.58 (1.58-8.13), self perception of bad quality work OR= 2.99 (1.35-6.59), inadequate work schedule OR= 2.84 (1.22-6.62), high mental / intellectual demand OR= 2.56 (1.12-5.86), age (in decades) OR= 1.82 (1.21-2.73), and score for physical environment complaints OR= 1.30 (1.03-1.64).

Conclusions: Most of work stressors considered are associated with psychiatric symptoms. Prevention should target the most frequent stressors with high association to symptoms. Complaints of police officers about stressors should receive proper consideration by the management of public administration. Such complaints might be the expression of psychiatric caseness requiring medical assistance. Particular attention should be given to police officers complaining about many stressors identified in this study's multiple model.

Keywords: Work-related stress, Police, Mental health, Langner's scale

Introduction

Mental disorders are highly prevalent in the vast majority of countries. These health problems are characterized by their high chronicity, the seriousness of impairment they can cause (Lopez, Mathers, Ezzati, Jamison, & Murray, 2006; The WHO World Mental Health Survey Consortium, 2004) and their comorbidity (Kessler, Ormel, Demler, & Stang, 2003). Mental health problems are becoming a main concern for organizations. They are associated to long sickness absences and loss of productivity. Problems in mental health at work are of growing importance and research on factors contributing to their development is crucial.

Working as a police officer implies high physical, mental, and emotional demands. Mental health appears particularly crucial in this population of workers as mental disorders might result in tragic consequences for both the affected workers and the population they are supposed to serve. Police officers appear particularly at risk of developing mental health problems. For example, this profession is characterized by a high rate of suicide (Adshead, 1997; Schmidtke, Fricke, & Lester, 1999). Posttraumatic stress disorders appear as frequent mental disorders in police officers (Carlier, Lamberts, & Gersons, 1997). Strong evidence from past research is also pointing towards chronic stress factors to explain part of the mental health problems in this particular population of workers. For example, Huddleston, Stephens, & Paton (2007) concluded that daily organizational stressors such as resources concerns (e.g. insufficient resources, unreliable equipment, lack of financial resources), activity issues (e.g. irregular meal times, shift work interfering with other activities), workload and administration issues (e.g. paperwork) are good predictors of psychological distress in police officers.

Chronic stressors in police work are often divided in two broad categories (Biggam, Power, Macdonald, Carcary, & Moodie, 1997; Kop, Schaufeli, & Euwema, 1999; McCreary & Thompson, 2006). The first category of stressors concerns the operational aspects of work (e.g. exposure to physical threats, responding to a bloody crime scene, verbal aggression from the public, etc.). The second category concerns organizational aspects (e.g. managerial style, lack of social support, staff shortages, etc.). Many studies aimed at determining which categories of stressors are the most important in police work. The rationale for such studies is to verify if stress in police officers is similar to stress in other occupations, and if findings from other occupations can be applied to police work, for example to implement adequate prevention programs (eg. Collins & Gibbs, 2003; Kop et al., 1999). Scientific literature is not clear on the comparability of police stress with stress in other populations of workers. On the one hand, studies concluded that the operational nature of this job does not appear stressful for the officers exposed and that organizational stressors are similar to other occupations (e.g.Hart & Cotton, 2003). On the other hand, studies show that police stress is quite specific and can even hardly be compared to stress in other occupations dealing with emergency situations (e.g. Brough, 2004)). This debate is interesting but gives only limited information on the importance of specific stressors and their potential health effects. Better knowing the association of occupational stressors with mental health symptoms in a population of police officers might contribute to implement better adapted prevention programs. Identifying stressors associated with psychiatric symptoms might also be helpful in identifying police officers who might be at risk for developing mental disorders. Therefore, prevention could take place at both organizational and individual level. To our knowledge, only few studies identified specific stressors in police work and none of them measured the specific stressors' association to mental health problems. In summary then, the aims of this study are (1) to identify work related stressors that are associated with psychiatric symptoms in police officers and (2) to identify a set of work related stressors suited to predict psychiatric symptoms in police officers.

Materials and methods

Study population and participants
A cross-sectional survey was conducted by administering a questionnaire to all police officers, inspectors, and non-professional staff working for a cantonal administration in Switzerland.
Questionnaires were sent to all potential participants (N=1012) between April and June 2007. Participants were recruited to voluntarily complete a self-administered anonymous questionnaire during their working time. After completion, questionnaires were returned by means of a prepaid envelope to the Institute for Work and Health (University of Lausanne and University of Geneva). The study protocol was approved by the research institution that coordinated the project, the workers' professional association and the direction of the public administration where the study took place. All persons gave their informed consent prior to their inclusion in the study. Participants were free to withdraw consent at any time. No incentives were provided for participation. Employees who were absent (i.e. maternity leave, long sickness absence spells) at the time of the survey were not included. The study was supported by the management of the cantonal administration and the local professional associations. Thus, a good overall (including police officers, inspectors, and non professional staff) response rate was achieved (N=682, 67.4%). We selected the subset of all 354 male police officers (uniformed

constables). Female police officers were not included due to small sample size and potential effect of gender on symptoms and stressors (Berg, Hem, Lau, Haseth, & Ekeberg, 2005; Collins & Gibbs, 2003). The specific response rate for the subset of male police officers was slightly lower (65.9%) than the overall sample's rate. Summaries for socio demographical characteristics are shown at Table 1.

Questionnaire
We designed a 14 pages self administered anonymous questionnaire to collect demographic, work related stressors, and symptoms data. The questionnaire took approximately 20 minutes to answer. A study on occupational stress took place in 1998 in the cantonal administration where the present study was performed. At the time, a questionnaire based on work activity analysis (involving shadowing police officers in their daily work and interviews with police officers) and covering many aspects of stress and working conditions was developed. For the present study, the choice was made not to use a standardized measurement tool. We made this choice with the view to ensuring a certain comparability of results from the present study and the results from the 1998 survey. Results from this comparison are not covered in the present article.

Work related stressors
Single items were used to measure stressors. Such measures seemed appropriate for face validity matter. In addition, the constructs measured were rather narrow suggesting that using single items would not cause important validity issue. Responses to these items used a 6 point scale (from "0-not stressful at all" to "5-very stressful"). We presumed that answers as "not stressful at all" to "moderately stressful" corresponded to annoyances that did not exceed the respondent's resources (e.g. coping, recovery time, individual and collective strategies). Conversely, we presumed that answers as "stressful" of "very stressful" exceeded the respondent's resources. Thus, answers on these items were later collapsed (answers 0-1-2-3 = "absence of the stressor"; answers 4-5= "presence of the stressor"). Items included questions on mental, intellectual, or emotional demands, workload (e.g. time pressure, staff shortages, etc.), work schedule, ambiguity and conflicting orders, esteem from the authorities or from the public, career development (e.g. poor pay, instability of the structure, etc.) as well as conflicting demand of work and private life.

A scale for complaints about the physical environment was calculated from 17 items. Using six-points scales (ranging from 0 "not at all" to 5 "tremendously", respondents had to rate their level of annoyance regarding noise, vibrations, light (in general), artificial light, odours, dust, heat, cold, quick changes in temperature, draughty workspace, humidity, dry air, lack of fresh air, small offices and constrained workstation, work in very close quarters, gas-vapors-smoke, and passive tobacco smoke. The total score was standardized by its highest possible value and then multiplied by 10. Standardized scores (continuous) range from 0 to 10 and higher scores indicated higher level of stress due to physical environment. Items included in the score of complaints related to the physical environment were verified for inter-item correlation and items-scale correlation (Cronbach, 1951). This scale had a high items-scale correlation (Cronbach's alpha =0 .90).

Psychiatric symptoms
Symptoms and health complaints were measured with the Langner's scale of psychiatric symptoms (Langner, 1962). This scale, which has been shown to be a valid assessment measure of common mental nonpsychotic disorders, was also used in several studies and for diverse occupations (Juillard et al., 1985; Laurent et al., 1995). This scale highly correlates with diverse mental health measurement tools (Manis, Brawer, Hunt, & Kercher, 1963; Shader, Ebert, & Harmatz, 1971). The scale's reliability was investigated by Johnson & Meile, (1981). Using a survey of more than 11000 respondents, they obtained alpha reliability coefficients of 0.77. They also found little discrepancy in this result across age, gender, and education. The French version of this scale was adapted by (Amiel, 1986). Items include different non-specific symptoms e.g. feel weak all over, sleep problems, poor appetite, etc. Items are listed in Langner (1962). The scale is calculated by adding the number of pathognomonic responses. Possible scores range from 0 to 22. For comparability's sake, we used the same cutting point as in other studies using the French version of the questionnaire (Amiel, 1986; Ramaciotti & Perriard, 2000). Thus, in the present study participants with score for Langner's scale of 9 and above can be considered to have a high score for psychiatric symptoms.

Statistical analysis
After data cleaning and editing procedures, descriptive statistics were used to describe participants' answers on demographics, symptoms and stressors questions. Univariate association between the dependent variable and the candidate covariates were analyzed using the logistic command. Robust Standard Errors were used (Royall, 1986).

Next, a multiple logistic regression model (logistic and logit command) was applied to assess the association of psychiatric symptoms and exposure to work related stressors. Backward variable selection was used to select a combination of stressor variables suited to predict whether a participant had a high score for psychiatric symptoms. A covariate was kept into the multivariate model if the P value for the univariate association to the outcome variable was 0.1 or less, or if the covariate was a known confounder or a covariate of interest. The score for "physical environment complaints" and the variable "age" were treated as continuous. Multicollinearity was assessed using the Variance Inflation Factor (VIF); potentially important interactions of chronic stressors and demographics were verified by including individual multiplicative terms in the logistic regression model. At P<0.05, none of the coefficients for interaction terms were significant in the model. After verifying the linearity in the logit for all the candidate covariates with the Box-Tidwell procedure (boxtid command, STB-50: sg112.1), the choice was made to run the model as originally proposed. High leverage points (outliers with large influence) were identified with the leastlikely command (Freese, 2002) using an approximation of Cook's distance (Pregibon, 1981). The global goodness of fit of the model was evaluated using the McFadden's adjusted R^2 statistics and the area under the Receiver Operating Characteristic (ROC) curve. Both sensitivity and specificity were addressed.

Missing data for age (n=2) were replaced by the sample's mean for this variable. None of the variables used for the present paper had a missing value ratio higher than 5%. Work related stressors were coded 0 (absence of the stressor) or 1(presence of the stressor). The coding of the dependent variable was 0 (medium or low score for psychiatric symptoms) and 1 (high scores for psychiatric symptoms). Thus, odds ratio higher than 1 are to be interpreted as a positive association of a stressor's presence and the odds for having a high score for psychiatric symptoms on Langner's scale.

The analyses were performed with the software STATA for Windows release 10.0 (Stata corporation, College Station, TX, USA).

Results

Demographics
The mean age of respondents was 39.7 ± (8.9). The mean length of service was 14.3 ± (10.1) years. Table 1 shows the breakdown of respondents by marital status, number of working years, educational level, number of children and age. As shown in Table 2, age (6.60, P=0.011) and length of service (12.39, P=0.004) were significantly associated with high scores for psychiatric symptoms.

(insert Table 1 around here)

Psychiatric symptoms and Langner's score
The mean score for psychiatric symptoms was 4.27± (3.63). A total of 42 (11.9%) officers had a high score for psychiatric symptoms indicating potential psychological caseness that could merit professional clinical attention. Most frequent symptoms reported are "feel weak all over" (n=227, 64.1%) and "being a worrying type" (n=196, 55.4%). Around one third of officers reported being unsatisfied with their memory (n=114, 32.2%) or having frequent "feeling of heavy head or clogging in nose" (n=126, 35.6%).

(insert Table 2 around here)

Stressors
Table 3 details for each stressor the number of police officers reporting it stressful or very stressful. This table also shows univariate association (OR odds ratio and 95% Confidence Interval) of stressors and high scores for psychiatric symptom. A majority of police officers reported as stressful or very stressful the following aspects of their work: "exposure to violence" (n=326, 92.1%) "high mental or intellectual demand" (n=214, 60.4%), staff shortages (n=244, 68.9%), and poor pay (n=200, 56.5%). The mean score for complaints about the physical environment was 0.33± (0.18).

(insert Table 3 around here)

Univariate association of stressors with high scores for psychiatric symptoms
Nearly all stressors were significantly (at P<.05) associated with high scores for psychiatric symptoms. This association was particularly striking for some stressors like "lack of support from superior and organization" OR = 5.92 (3.01-11.64), "ambiguity of orders" OR = 4.45 (1.85-10.70), "bad atmosphere at work" OR = 4.40 (2.01-9.61),"career stagnation" OR = 4.45 (2.23-8.86), and "conflicting demand of work and home" OR = 3.96 (1.96-

7.99). Odds ratios for operational stressors were significant at P<.05 for all but one stressor: "exposure to violence" OR = 0.79 (0.26-2.41).

Multiple model

Age and number of working years were highly correlated (n=354, Spearman's r=.83, p<0.001). In order to avoid interdependency between those two variables, we decided to enter age and exclude number of working years. Logistic regression with backward procedure resulted in a multiple variable model including 6 independent variables. A test of the full model with all 6 variables against a constant only model was statistically significant, Wald $\chi 2$(6, N=353)=53.13, P<0.001. The Mcfaddens's adjusted pseudo R2 was 0.180 and the area under the ROC curve was 0.824. The sensitivity was equal to 66% and the specificity was equal to 80%, for an overall success rate of 78%. None of the variables initially introduced in the multivariate model had a value higher than 2.08 for the Variance Inflation Factor (VIF). One case with high leverage was identified: verification showed that important and very recent changes occurred in the respondent's career. Therefore we decided to ignore this case in the multivariate analysis.

Table 4 shows regression coefficients, Wald statistics, odds ratios, and 95% confidence intervals for odds ratios for each of the six independent variables. A covariate was kept into the multivariate model if the P value for the univariate association to the outcome variable was 0.1 or less. However, all independent variables resulting from the backward procedure were significant at P<.05. Independent variables identified are: lack of support from superior and organization OR= 3.58 (1.58-8.13), self perception of bad quality work OR= 2.99 (1.35-6.59), inadequate work schedule OR= 2.84 (1.22-6.62), high mental / intellectual demand OR= 2.56 (1.12-5.86), age in decades OR= 1.82 (1.21-2.73), and score for physical environment complaints (standardized) OR= 1.30 (1.03-1.64).

(insert Table 4 around here)

Discussion

The first goal of this study is to identify work related stressors that are associated with psychiatric symptoms in police officers. For most stressors considered, univariate analysis shows statistically significant associations of stressors with a high score for psychiatric symptoms. Organizational stressors like poor pay and staff shortage are reported as stressful by a majority of police officers. However, the association with high scores on Langner's scale is stronger for other stressors like ambiguity and conflicting orders, bad atmosphere at work, lack of support from the supervisor and the organization, and career stagnation. These results are consistent with the general scientific literature on psychosocial factors and occupational mental health. The results from the present study also show that many operational stressors are important for police officers. Work characteristics like mental and intellectual demand, emotional demand, and exposure to violence are reported as stressful by a majority (between 56.8% and 92.1%) of police officers. Univariate analysis also shows that nearly all operational stressors considered were positively associated to high scores on Langner's scale. Some authors suggested that exposure to stress in police officers is similar to other populations of workers since the operational nature of this job does not appear stressful for the officers exposed (e.g. Biggam et al., 1997; Collins & Gibbs, 2003). Conversely, the results from the present study support the idea that operational aspects, and not only organizational ones, are important stressors in police officers. In addition, the distinction between operational and organizational stressors is not always clear in practice. For example, an organizational stressor like "conflicting orders" might concern operational aspects of work (e.g. use of weapon, call for help, let other police units perform the operation, etc.) and have a direct impact on the way operations are performed (e.g. establishing priorities of means to use) and on how stressful the situation is perceived by the police officer. In this perspective, stress arises from the combination of different stressors from both organizational and operational aspects.

The second goal of this study is to identify a set of independent work related stressors suitable to predict psychiatric symptoms in police officers. The model resulting from the backward selection procedure includes the 6 following variables: age, high mental and intellectual demand, inadequate work schedule, lack of support from the supervisor or the organization, self perception of bad quality work, and score for physical environment complaints.

The lack of support from the supervisor appears as a major stressor in this study. Both the univariate association and multiple variable model support the idea that this stressor is a major contributing factor to adverse mental health outcome. These results are also consistent with the literature on psychosocial risks in general (Stansfeld, Fuhrer, Shipley, & Marmot, 1999). In this view, the importance of low support from the supervisor might result

from its intrinsic stressful potential (e.g. I face these difficulties alone). Support from the supervisor can also be seen as a facilitating factor for the adaptation of work by the officers (e.g. I can improve the situation and I can expect some help in doing so). For example, officers having the impression that their supervisors support them might be more eager to adapt their working conditions or suggest structural and organizational improvements. These improvements could in turn affect positively officers' health. These two aspects of lack of support from supervisors require different types of corrective measures. For the first aspect, officers would benefit from measures aiming at improving acknowledgment or symbolic reward from the supervisor. For the second aspect, measures might include participatory programs and interventions (e.g. focus group) involving officers and their superior and aiming to improve working conditions. In one case, the measure targets the acknowledgement of individuals' involvement and effort. In the second case, the measure's target is actual work activity and officers' perceived capabilities to influence it. Research on psychosocial stressors in police officers would benefit from more detailed measurement of support.

The association of score for physical environment complaints to high scores for psychiatric symptoms was significant in both univariate and multivariate analyses. One possible explanation is that physical environmental stressors are important stressors in police officers. This score might also reflect the sensitivity to stressors in general, or the tendency to give high rates for stressors. Despite an important diversity in the nature of stressors considered, items used to calculate the score were highly correlated (Cronbach's alpha= 0.90). This points in the direction of the second possible interpretation and controlling for this score in the multiple model appears particularly relevant. As mentioned by (Frese & Zapf, 1988), correlations between stressors and symptoms are over estimated when they are measured with the same method. Part of this inflated correlation might be due to potential biasing variables (Spector, 2006) like individual perception (e.g. negative affect of the respondent). Entering the score for physical environment complaints into the multiple model contributes to control for the general tendency to complain about diverse stressors and symptoms resulting from monomethod biases.

In the present study, a total of 42 out of 354 (11.9%) police officers had a high score for psychiatric symptoms. This seems low in comparison to other studies on mental health in police officers. For example, Biggam et al. (1997) used a different instrument (GHQ-28) for measuring potential mental health cases in a comparable population. They identified 23% of police officers with potential caseness for psychological distress. The proportion is even larger for Brown, Fielding, & Grover (1999) who reported that 40% of their sample of police officers scored at or over the threshold value for the GHQ-12. Such a difference between the results of the present study and results from the scientific literature was not expected, although the definition of potential caseness differs from one instrument to the other. In fact, both instruments aim at identifying cases with potentially non-acute psychiatric conditions. One possible explanation is that police officers in the study sample are in better health than police officers investigated in other studies. Another plausible explanation is that the threshold value suggested by Amiel (1986) is not adapted to high demanding jobs. Due to difficult working conditions in highly demanding jobs, workers suffering from several symptoms could be forced to quit their job or go on sick leave before they reach the threshold value suggested by Amiel (1986). Other plausible explanations are discussed below.

Several potential limitations of this study must be addressed. The cross-sectional design precludes any causal inference. Actually, it is unclear which way the effect was going, as psychiatric problems may have influenced the perception of work related stressors. The causality is not investigated in the present study. However, the scientific literature is clear on the pathogenesis of mental health disorders and there is evidence that stressful working conditions is a risk factor (De Lange, Taris, Kompier, Houtman, & Bongers, 2004; Godin, Kittel, Coppieters, & Siegrist, 2005). We relied on single item to measure most of stressors included in the present study. Single items do not allow for the estimation of internal-consistency reliability and could poses threat to the validity of our conclusions. However, the stressors we considered seem rather narrow constructs. Therefore, single items should be appropriate measures. As mentioned above, part of the correlation between stressors and symptoms might be due to monomethod biases. Such biases could not be ruled out although controlling for physical environment complaints in the multiple model partly address this issue. Controlling for personality variables or including items with low dependency on cognitive and emotional processing would have been effective ways to avoid such biases (Frese & Zapf, 1988). All police officers included in the study work for the same organization and in the same geographical area. This potentially contributes to limit generalization of the findings to other police departments. Another potential limitation to consider is selection bias. The association of stressors and high scores for psychiatric symptoms might be affected if either stressors or symptoms have influenced the participation to the study. As officers who were absent for health reasons at the time of the study were not included, such bias could not be ruled out. Conversely, officers with high stress or severe symptoms at the time of the study might have been more motivated to participate, expecting the findings to foster improvements on stressful working conditions. Despite these potential selection biases, the sample size and the

satisfactory response rate support the idea that the data collected reflects well the situation for the whole study population. Most of stressors we considered were related to organizational and operational aspects in police work. Stressors in this profession might also come from other sources. Studies emphasizing the interface of private and professional life (e.g. time-budget studies) in police officers are needed. Age appeared associated with high scores for psychiatric symptoms. This association was also supported by the multiple model. As mentioned in a study of stress in aging police officers (Gershon, Lin, & Li, 2002), the association of stress with mental health problems might be underestimated as stress related health problems (e.g. cardio-respiratory diseases) might increase mortality and morbidity of stressed workers over time. Since such pathologies develop over several years of exposure to stressful work, most severely affected older officers are probably underrepresented (Franke, Ramey, & Shelley, 2002). This could be the case with the present study and the association of age with high scores for psychiatric symptoms could be larger than the results of this study.

Conclusion

This study shows that many operational and organizational stressors are associated with symptoms of mental health problems in police officers. Prevention should target tasks with high mental and intellectual demand, problems related to inadequate work schedule, lack of support from the supervisor or the organization, and self perception of bad quality work. These stressors are characterized by an important association with symptoms, and have a good potential for transformation. For example, measures to improve the quality of support from supervisors might include management and leadership courses. Organizational measures fostering appraisal and recognition of work well done could contribute to compensate for the self perception of doing bad quality work as expressed by some police officers. The implementation of flexible working schedules could also contribute to reduce stress due to constraining working time. These measures appear promising in reducing symptoms of mental health problems in police officers. Complaints of police officers about stressors they face in their work should receive proper consideration by the management of public administration. Such complaints might be the expression of psychiatric caseness requiring medical assistance. Particular attention should be given to police officers complaining about many stressors identified in this study's multiple model. Prevention at an individual level should aim at identifying officers combining many of these stressors and clinical assistance should be offered to them.

Conflict of interest
The authors declare that they have no conflict of interest.

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Table 1 Demographics of participants (N=354)

Variable	n	%
Age		
20 - 29 years	49	13.8%
30 - 39 years	131	37.0%
40 - 49 years	117	33.1%
50 - 59 years	55	15.5%
60 years and more	2	0.6%
With children aged < 18 years of age		
yes, at least 1 child <18	172	48.6%
no child < 18 years	182	51.4%
Marital Status		
Single, divorced or separated	80	22.6%
Married or cohabiting	274	77.4%
Working years as police officer in cantonal administration		
0 - 5 years	97	27.4%
> 5 - 10 years	65	18.4%
> 10 - 15 years	33	9.3%
> 15 - 20 years	46	13.0%
> 20 - 25 years	49	13.8%
more than 25 years	64	18.1%
Educational level before police academy		
Lower or intermediate educational level	341	96.3%
Higher vocational education or University	13	3.7%

Table 2 Demographics of participants (N=354) and association with high scores of psychiatric symptoms

	N	High scores for psychiatric symptoms		Wald Chi2-robust (P)
		n	row %	
Total sample	354	42	11.9%	
Age*				6.60 (P=0.011)
less than 30 years of age	49	3	6.1%	
30 - 39 years of age	131	10	7.6%	
40 - 49 years of age	117	19	16.2%	
50 - 59 years of age	55	10	18.2%	
60 years of age and more	2	0	0.0%	
Marital Status				2.95 (P=0.086)
Single, divorced or separated	80	5	6.2%	
Married or cohabiting	274	37	13.5%	
With children aged < 18 years of age				0.21 (P=0.644)
yes, at least 1 child <18	182	23	12.6%	
no child < 18 years	172	19	11.0%	
Working years as police officer in cantonal administration *				12.39 (P=0.004)
0 - 5 years	97	5	5.2%	
> 5 - 10 years	65	6	9.2%	
> 10 - 15 years	33	3	9.1%	
> 15 - 20 years	46	6	13.0%	
> 20 - 25 years	49	7	14.3%	
more than 25 years	64	15	23.4%	
Educational level prior police academy				0.16 (P=0.691)
Lower or intermediate educational level	341	40	11.7%	
Higher vocational education or University	13	2	15.4%	

*treated as continuous

Table 3 Univariate logistic regression analysis between work related stressors and high scores for psychiatric symptoms

Work related stressors	N	N%	n	Row%	OR (95%CI)
			High scores for psychiatric symptoms		
Stressors related to job content					
high mental / intellectual demand	214	60.4	34	15.9	3.12 (1.39-6.96)
high emotional demand	201	56.8	33	16.4	3.14 (1.45-6.79)
exposure to sad situations	90	25.4	19	21.1	2.80 (1.44-5.44)
frequent interruptions	82	23.2	17	20.7	2.58 (1.32-5.07)
frequent work in emergency situation	121	34.2	20	16.5	1.90 (0.99-3.64)
exposure to violence	326	92.1	38	11.7	0.79 (0.26-2.41)
dangerous interventions	128	36.2	20	15.6	1.71 (0.90-3.29)
low esteem from the public	118	33.3	22	18.6	2.48 (1.29-4.75)
low esteem from the authorities (judges, politicians)	58	16.4	13	22.4	2.66 (1.28-5.50)
Organizational stressors					
excessive workload	135	38.1	23	17.0	2.16 (1.13-4.14)
time pressure	118	33.3	21	17.8	2.22 (1.16-4.25)
staff shortages	244	68.9	34	13.9	2.06 (0.92-4.62)
inadequate work schedule	52	14.7	12	23.1	2.72 (1.29-5.75)
ambiguity of orders / conflicting orders	27	7.6	9	33.3	4.45 (1.85-10.7)
bad atmosphere at work	38	10.7	12	31.6	4.40 (2.01-9.61)
lack of esteem from the superior	84	23.7	20	23.8	3.52 (1.81-6.86)
lack of support from superior and organization	76	21.5	23	30.3	5.92 (3.01-11.64)
lack of support from other services	77	21.8	17	22.1	2.86 (1.45-5.63)
lack of support from colleagues	26	7.3	6	23.1	2.43 (0.92-6.46)
self perception of bad quality work	71	20.0	18	25.4	3.66 (1.86-7.23)
meaningless work	55	15.5	12	21.8	2.50 (1.19-5.26)
instability of the organizational structure	97	27.4	21	21.6	3.10 (1.61-6.00)
poor pay	200	56.5	24	12.0	1.03 (0.54-1.98)
lack of consultation in promotion/transfer	64	18.1	11	17.2	1.73 (0.82-3.67)
career stagnation	36	10.2	18	28.6	4.45 (2.23-8.86)
Home work interface					
conflicting demands of work and home	58	16.4	16	27.6	3.96 (1.96-7.99)
Physical environment					
score for physical environment complaints *					1.37(1.25-1.62)

*continuous, standardized, possible values 0-10

Table 4 Model for identifying officers with high scores of psychiatric symptoms (multiple logistic regression analyses n=353*)

Variable	Coefficient (β)	Robust Standard Error	Wald χ²	P Value	Odds Ratio	95% CI
Dichotomous variables						
lack of support from superior and organization	1.28	0.42	3.05	0.002	3.58	1.58-8.13
self perception of bad quality work	1.09	0.40	2.71	0.007	2.99	1.35-6.59
inadequate work schedule	1.04	0.43	2.41	0.016	2.84	1.22-6.62
high mental / intellectual demand	0.94	0.42	2.22	0.026	2.56	1.12-5.86
Continuous variables						
age (in decades)	0.60	0.21	2.89	0.004	1.82	1.21-2.73
score for physical environment complaints (standardized, possible values 0-10)	2.61	1.19	2.20	0.028	1.30	1.03-1.64

*one case with high leverage was identified. After data verification, this case was excluded from the analysis because important and very recent changes occurred in the respondent's career.