

# Police officers: a high-risk group for the development of mental health disturbances? A cohort study

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## ABSTRACT

**Objectives:** Policing is generally considered a high-risk profession for the development of mental health problems, but this assumption lacks empirical evidence. Research question of the present study is to what extent mental health disturbances, such as (very) severe symptoms of anxiety, depression and hostility are more prevalent among police officers than among other occupational groups.

**Design:** Multicomparative cross-sectional study using the data of several cross-sectional and longitudinal studies in the Netherlands.

**Participants:** Two samples of police officers (N=144 and 503), employees of banks (N=1113) and employees of banks who were robbed (N=144); employees of supermarkets (N=335), and a psychiatric hospital (N=219), employees of a governmental social welfare organisation (N=76), employees who followed a training based on rational-motive therapy to strengthen their assertiveness (N=710), soldiers before deployment (N=278) and before redeployment (N=236) and firefighters (N=123). The numbers refer to respondents with complete data.

**Primary outcomes:** Prevalence of severe (subclinical level) and very severe symptoms (clinical level) were computed using the Dutch norm tables (80th percentile and 95th percentile, respectively) of the Symptom Check List Revised (SCL-90-R). All comparisons were controlled for age, gender and education.

**Results:** Multivariate logistic regression and analyses showed that the prevalence of clinical and subclinical levels of symptoms of anxiety, depression and hostility among police officers were not significantly higher than among comparison groups. The same pattern was found for the other SCL-90-R subscales.

**Conclusions:** We found no indications that self-reported mental health disturbances were more prevalent among police officers than among groups of employees that are not considered high-risk groups, such as employees of banks, supermarkets, psychiatric hospital and soldiers before deployment.

Police officers are commonly considered to be a high-risk group for the development of mental health disturbances because of the various critical incidents and potential

## ARTICLE SUMMARY

### Article focus

- It is generally assumed that police officers, due to the specific nature of their work, are at (high) risk for the development of mental health problems.
- The results of the very limited number of studies that compared the mental health of officers with one or two comparison groups suggest that this assumption needs further proof.
- To assess this assumption, clinical as well as sub-clinical levels of mental health problems of officers were compared with nine other occupational groups while controlling for demographics.

### Key messages

- In contrast to this generally held belief, officers did not report more (serious) mental health problems than any of the other examined groups in our multicomparative study.
- The protective effects of self-selection, the resilience of police officers and a rigorous selection process of recruits might be an explanation of the relatively low prevalence rates of mental health disturbances.

### Strengths and limitations of this study

- To the best of our knowledge, this is the first multicomparative study examining to what extent clinical as well as subclinical levels of symptoms of anxiety, depression and hostility are more prevalent among police officers than among people in other occupations, while controlling for demographics.
- We did not conduct clinical interviews.

traumatic events they encounter during their career. These so-called operational stressors, such as witnessing the death of children, confrontations with victims of sexual harassment, serious traffic accidents, suicide and experiencing violence, might increase the risk of symptoms of anxiety, hostility and fatigue. A (small) minority may develop mental disorders, such as depression and post-traumatic stress disorder (PTSD).<sup>1-4</sup>

However, research in the past 20 years among police officers has shown that organisational stressors such as conflicts, work load and lack of support are more likely to be adverse sources of stress than operational stressors. In other words, although police officers are more frequently confronted with critical incidents than for example employees of banks or supermarkets, organisational stressors—which are not specific for the police—appear to have more impact on health and well-being than (daily) operational stressors.<sup>2 5–7</sup>

This may explain the outcomes of a study<sup>8</sup> in the UK which ranked 26 professions according to their scores on general psychological well-being and physical health. The rank orders for police officers was 9th and 11th, with the first place denoting the professional occupation with the highest absolute mean score of health problems. Teachers, a professional group that is not typically associated with frequent exposure to potential traumatic stressors, ranked second on both well-being and physical health. Similarly, an earlier smaller Australian comparative study reported that police officers showed significantly more favourable levels of well-being and psychological distress than school teachers and the general population (ie, Australian norm scores).<sup>9</sup>

However, to the best of our knowledge there is no, peer reviewed—published multic comparative study that (1) statistically examined differences in symptom levels between the police and several other occupational groups while also controlling for confounding factors such as age, gender and education and (2) focused on specific mental health disturbances including subclinical and clinically relevant levels of symptoms of anxiety, depression and hostility. The aim of this comparative study was to explore self-reported mental health of police officers compared to members of other professions, to investigate whether there are empirically based indications that policing may be considered a high-risk profession for the development of mental health disturbances.

## METHODS

### Samples and procedures

In the present study we compared police officers with nine other occupational groups. The presented numbers of each group refer to the number of respondents of each study group with complete data.

We compared the health of two samples of officers ( $N^{\text{group}1}=144$  and  $N^{\text{group}2}=503$ ) with other occupational groups. Group 1 consisted of police officers working in the eastern part of the Netherlands (region department North and East Gelderland, response=60%).<sup>10</sup> This group was originally selected in 2002 to provide reference data for group 2 to examine the consequences of the disaster and other critical incidents on health. Group 2 consisted of police officers who were involved in the Enschede fireworks disaster and its aftermath (The Netherlands, 2000), and participated in a survey 4 years postevent (2004, response=80.5%).<sup>5</sup> At that time,

only one officer (0.2%) suffered from probable disaster-related PTSD. These studies were conducted on behalf of the Dutch Ministry of Health, Welfare and Sports.

We compared the two groups of officers with the following non-clinical groups of employees participating in various Dutch studies on health and critical incidents at work. Furthermore, data from group 6 were obtained to evaluate a training programme (see below). The year of data gathering is presented between brackets and funding for each study will be described. This study is a clear example of a data-sharing research project of the researchers involved.

- ▶ Groups 3 and 4 (1991): A nationwide sample of 1257 front office employees of savings banks, of whom 11.5% experienced one or more bank robberies ( $N^{\text{group}3}=1113$  and  $N^{\text{group}4}=144$ , respectively, response=71%).<sup>11</sup> This cross-sectional study was conducted on behalf of a Savings Banks Association, the Netherlands.
- ▶ Group 5 (1996): A random sample of mental health care professionals, that is, nurses and therapists of a psychiatric hospital ( $N=219$  and response=70%).<sup>12</sup> This cross-sectional study was conducted on behalf of a Psychiatric Hospital.
- ▶ Group 6 (1997–1998): Random sample of employees of various organisations, before participating in a Rational-motive therapy (RET) training ( $N=710$ , response=74%)<sup>13</sup> aimed at improving their assertiveness and well-being. The cross-sectional study was conducted on behalf of a training institute in the Netherlands.
- ▶ Groups 7 and 8 (2005–2007): Sample of 524 soldiers from a larger prospective cohort study on stress-related disorders who were assessed prior to a 4-month deployment to Afghanistan of whom 241 were deployed before ( $N^{\text{group}7}=278$  and  $N^{\text{group}8}=236$ , respectively, response=82.5%),<sup>14</sup> conducted on behalf of the Dutch Ministry of Defense.
- ▶ Group 9 (2002): Firefighters from the Utrecht firefighters department ( $N=123$ , response=48%).<sup>15</sup> This cross sectional study was conducted on behalf of the Dutch Ministry of Health, Welfare and Sport.
- ▶ Group 10 (1995): Employees of a governmental social welfare organisation in the Western part of the Netherlands, who had direct contact with clients of the organisation ( $N=76$ , response=65%).<sup>16</sup> This cross-sectional study was conducted to finish the Occupational Physician education programme of the researcher.
- ▶ Group 11 (1996): A nationwide random sample of employees of local supermarkets ( $N=335$ , response=88%).<sup>17</sup> This cross-sectional study was conducted on behalf of a large supermarket organisation in the Netherlands.

All participants in the studies mentioned above, received written information about the scientific study aims. None of the funding organisations mentioned above were involved in the present study design, analyses and manuscript.

## Measures

Besides questions regarding age, gender and education, respondents of all groups, except for group 11, completed the total Symptom Check List Revised (SCL-90-R).<sup>18 19</sup> This instrument uses a five-point Likert scale (from 1, 'not at all' to 5, 'extremely') and assesses symptoms over the previous 7 days. The validity and reliability of the Dutch SCL-90-R have proven to be satisfactory.<sup>19</sup> The Dutch cut-off scores<sup>19</sup> from 1986 for males and females of a normal population were used to identify participants with (1) at least severe symptoms of anxiety, depression, sleeping problems and hostility (80th percentile) and (2) with very severe symptoms (95th percentile) that are clinically relevant and may be indicative for a mental disorder. Group 11 was administered a brief scale consisting of 17 random items of the SCL-90-R. Our control analyses showed that the sum score of the 17 items correlated highly with the total score of the SCL-90-R across several samples ( $r>0.95$ ). Education levels differed slightly across studies. We therefore made a distinction between those with high education levels (university and higher professional education) versus low-to-medium level (all other levels).

## Data analyses

Differences in demographics were assessed using  $\chi^2$ -statistics. Multivariate logistic regression analyses were used to examine to what extent very severe symptoms and severe symptoms were more prevalent among police officers, while controlling for age, gender and education level. Two composite variables on mental health were computed. The first composite variable was based on whether respondents reported very severe anxiety, very severe depression and/or very severe hostility symptoms or did not report very severe symptoms on any of these three scales. A similar composite variable was based on severe symptoms. The multivariate logistic regression analyses were repeated with these composite variables as

dependent variables, and group membership, age, gender and education as independent variables (predictors). Analysis of variance (ANOVA) was used to examine differences in mean scores on the sum score of 17 items between groups 1, 2 and 11 while controlling for the same possible confounding factors. SPSS V.18.0 was used to perform the analyses.

## RESULTS

The demographics are shown in table 1.  $\chi^2$ -Statistics indicated that study groups differed in gender ( $\chi^2=897.6$ ,  $df=9$ ,  $p<0.001$ ), age ( $\chi^2=798$ ,  $df=18$ ,  $p<0.001$ ) and educational level ( $\chi^2=852.4$ ,  $df=9$ ,  $p<0.001$ ).

The prevalence's of very severe symptoms (95th percentile) are presented (except for group 11) in table 2, as well as the adjusted ORs (Adj. ORs) and the 95% CI. In table 3, similar statistics are presented with respect to severe symptoms (80th percentile). A table of the bivariate ORs is available on request (see appendix A1).

Results clearly show that both groups of police officers are relatively healthy: the proportion of officers with very severe symptoms of anxiety, depression and hostility is extremely low ( $\leq 1.4\%$ ). Compared to all other study groups, police officers had similar or lower prevalence of clinical levels of mental health problems according to the Adj. ORs. When using a less strict criterion of sub-clinical levels, that is, at least severe symptoms instead of very severe symptoms according to the norm tables, the groups of officers still ranked as groups with relatively low prevalence rates. Furthermore, the proportion of officers with severe or very severe symptoms of anxiety or depression or hostility (ie, composite variables) was not significantly higher than among other groups. Additional analyses showed similar patterns with respect to the other subscales of the SCL-90-R (data not shown).

The results of ANOVA ( $F^{\text{main}}=25.5$ ,  $df=2$ ,  $p<0.001$ ) and post hoc analyses reveal the 2004 sample of police officers

**Table 1** Gender, age and education level of study groups\*

	N	Gender (%)		Age, years (%)			Education (%)	
		Males	Females	18–30	31–45	46–65	Low medium	High medium
1 Police officers	144	86.1	13.9	4.9	47.9	47.2	96.5	3.5
2 Police officers	503	88.7	11.3	6.0	56.5	37.6	91.7	8.3
3 Bank employees, not victim robbery	1113	34.1	65.9	48.7	38.3	13.0	81.0	19.0
4 Bank employees, victim robbery	144	47.3	52.7	37.8	44.6	17.6	79.1	20.9
5 Psychiatric hospital employees	219	37.9	62.1	41.6	47.5	11.0	61.6	38.4
6 Trainees AT	710	68.2	31.8	29.0	57.9	13.1	33.8	66.2
7 Soldiers, not deployed before	278	87.8	12.2	81.3	14.7	4.0	88.8	11.2
8 Soldiers, deployed before	236	94.5	5.5	43.6	43.2	13.1	85.2	14.8
9 Firefighters	123	96.7	3.3	17.1	39.0	43.9	94.3	5.7
10 Social welfare	76	40.8	59.2	15.8	50.0	34.2	42.1	57.9
11 Supermarkets	335	56.1	43.9	100	–	–	86.6	13.4
Total	3885	61.5	38.5	41.9	40.9	17.2	74.1	25.9

\*Demographic characteristics of respondents with complete data.  
AT, Assertiveness Training.

**Table 2** Differences in prevalence of severe anxiety, depression and/or hostility symptoms (scores 80th centile) between study groups (N=3550)

	Severe anxiety symptoms						Severe depression symptoms									
	Symptoms		Adj.		p Value	Adj.	Symptoms		Adj.		p Value	Adj.				
	N	%	OR	95% CI			OR	95% CI	OR	95% CI		OR	95% CI	p Value		
<b>Severe anxiety symptoms</b>														<b>Severe depression symptoms</b>		
Groups																
Police officers 1 (Ref.)	9	6.2	1							17	11.8	1				
Police officers 2 (Ref. second column)	17	3.4	0.54	0.24 to 1.24	0.15	1				26	5.2	0.41	0.22 to 0.79	0.01		
Bank empl., not victim robbery	80	7.2	1.52	0.73 to 3.17	0.26	2.82	1.61 to 4.92	0.00		134	12.0	1.26	0.72 to 2.20	0.41		
Bank empl., victim robbery	32	21.6	5.24	2.37 to 11.59	0.00	9.71	5.14 to 18.35	0.00		31	20.9	2.35	1.22 to 4.52	0.01		
Psychiatric hospital empl.	22	10.0	2.32	1.01 to 5.30	0.05	4.31	2.19 to 8.48	0.00		36	16.4	1.82	0.96 to 3.46	0.07		
Trainees AT	161	22.7	5.98	2.89 to 12.35	0.00	11.27	6.53 to 19.44	0.00		257	36.2	4.83	2.77 to 8.44	0.00		
Soldiers, not deployed before	17	6.1	1.02	0.43 to 2.42	0.97	1.91	0.93 to 3.93	0.08		20	7.2	0.60	0.29 to 1.21	0.15		
Soldiers, deployed before	12	5.1	0.85	0.34 to 2.09	0.72	1.58	0.74 to 3.41	0.24		18	7.6	0.63	0.31 to 1.29	0.21		
Firefighters	5	4.1	0.62	0.20 to 1.89	0.40	1.14	0.41 to 3.14	0.81		16	13.0	1.08	0.52 to 2.24	0.84		
Social welfare	13	17.1	4.32	1.72 to 10.88	0.00	8.04	3.64 to 17.77	0.00		17	22.4	2.56	1.20 to 5.47	0.02		
Education																
Low medium (Ref.)	231	8.9	1			1				336	13.0	1				
High medium	137	14.3	0.77	0.59 to 1.01	0.06	0.75	0.57 to 0.98	0.03		236	24.6	1.00	0.80 to 1.26	0.99		
Age																
18–30 (Ref.)	127	9.8	1			1				195	15.1	1				
31–35	168	10.6	0.85	0.60 to 1.21	0.36	0.83	0.58 to 1.18	0.29		266	16.7	0.86	0.64 to 1.15	0.31		
46–65	73	10.9	0.73	0.54 to 1.00	0.05	0.72	0.52 to 0.99	0.04		111	16.6	0.76	0.58 to 0.99	0.04		
Gender																
Males (Ref.)	240	10.9	1			1				371	16.8	1				
Females	128	9.5	0.70	0.53 to 0.91	0.01	0.71	0.54 to 0.93	0.01		201	14.9	0.72	0.58 to 0.90	0.00		
<b>Severe hostility symptoms</b>														<b>Severe symptoms composite variable</b>		
	Symptoms		Adj.		p Value	Adj.	Symptoms		Adj.		p Value	Adj.				
	N	%	OR	95% CI			OR	95% CI	OR	95% CI		OR	95% CI	p Value		
Groups																
Police officers 1 (Ref.)	16	11.1	1							26	18.1	1				
Police officers 2 (Ref. second column)	33	6.6	0.57	0.30 to 1.06	0.08	1				49	9.7	0.49	0.29 to 0.83	0.01		
Bank empl., not victim robbery	150	13.5	1.68	0.96 to 2.96	0.07	2.97	1.96 to 4.50	0.00		236	21.2	1.49	0.94 to 2.38	0.09		
Bank empl., victim robbery	30	20.3	2.62	1.34 to 5.10	0.00	4.62	2.68 to 7.98	0.00		49	33.1	2.66	1.52 to 4.64	0.00		
Psychiatric hospital empl.	29	13.2	1.74	0.89 to 3.40	0.10	3.07	1.78 to 5.31	0.00		52	23.7	1.78	1.03 to 3.08	0.04		
Trainees AT	224	31.5	5.06	2.86 to 8.94	0.00	8.96	5.90 to 13.59	0.00		328	46.2	4.66	2.90 to 7.49	0.00		
Soldiers, not deployed before	56	20.1	1.83	0.98 to 3.42	0.06	3.25	1.99 to 5.30	0.00		66	23.7	1.26	0.74 to 2.14	0.40		
Soldier, deployed before	44	18.6	1.73	0.93 to 3.25	0.08	3.07	1.87 to 5.02	0.00		52	22.0	1.20	0.70 to 2.05	0.50		
Firefighters	17	13.8	1.20	0.58 to 2.49	0.63	2.13	1.14 to 3.97	0.02		25	20.3	1.09	0.59 to 2.01	0.79		
Social welfare	17	22.4	3.62	1.68 to 7.82	0.00	6.42	3.30 to 12.51	0.00		21	27.6	2.31	1.17 to 4.53	0.02		
Education																
Low medium (Ref.)	419	16.2	1			1				591	22.8	1				
High medium	197	20.5	0.70	0.55 to 0.88	0.00	0.69	0.55 to 0.87	0.00		313	32.6	0.85	0.69 to 1.03	0.10		
Age																
18–30 (Ref.)	234	18.1	1			1				346	26.7	1				
31–35	276	17.4	1.12	0.84 to 1.49	0.46	1.13	0.84 to 1.51	0.43		403	25.4	1.11	0.87 to 1.44	0.40		
46–65	106	15.9	0.92	0.71 to 1.20	0.55	0.94	0.72 to 1.23	0.65		155	23.2	0.90	0.71 to 1.13	0.35		
Gender																
Males (Ref.)	433	19.7	1			1				698	27.1	1				
Females	183	13.6	0.55	0.44 to 0.68	0.00	0.55	0.44 to 0.69	0.00		306	22.7	0.63	0.52 to 0.77	0.00		

\*Anxiety and/or depression and/or hostility.

Adj. OR, OR adjusted for all study variables; AT, Assertiveness Training; empl., employee; Ref., reference group.

**Table 3** Differences in prevalence of very severe anxiety, depression and/or hostility symptoms (scores 95th centile) between study groups (N=3550)

	Very severe anxiety symptoms						Very severe depression symptoms									
	Symptoms		Adj.		p Value	Adj.		Symptoms		Adj.		p Value				
	N	%	OR	95% CI		OR	95% CI	N	%	OR	95% CI					
<b>Groups</b>																
Police officers 1 (Ref.)	2	1.4	1					2	1.4	1						
Police officers 2 (Ref. second column)	3	0.6	0.41	0.07 to 2.50	0.34	1		6	1.2	0.86	0.17 to 4.32	0.86	1			
Bank empl., not victim robbery	9	0.8	0.73	0.15 to 3.56	0.69	1.74	0.45 to 6.78	0.42	30	2.7	2.09	0.48 to 9.03	0.33	2.41	0.96 to 6.02	0.06
Bank empl., victim robbery	7	4.7	4.08	0.81 to 20.62	0.09	9.81	2.44 to 39.50	0.00	13	8.8	7.22	1.58 to 33.11	0.01	8.35	3.06 to 22.80	0.00
Psychiatric hospital empl.	1	0.5	0.38	0.03 to 4.41	0.44	0.91	0.09 to 9.12	0.94	13	5.9	4.92	1.07 to 22.71	0.04	5.68	2.06 to 15.64	0.00
Trainees AT	32	4.5	3.20	0.70 to 14.53	0.13	7.67	2.18 to 27.04	0.00	69	9.7	8.39	1.97 to 35.67	0.00	9.70	4.02 to 23.44	0.00
Soldiers, not deployed before	2	0.7	0.54	0.07 to 4.14	0.55	1.30	0.20 to 8.38	0.78	1	0.4	0.22	0.02 to 2.52	0.22	0.26	0.03 to 2.19	0.21
Soldiers, deployed before	0	0.0	NA						2	0.8	0.56	0.08 to 4.09	0.57	0.65	0.13 to 3.30	0.61
Firefighters	0	0.0	NA						2	1.6	1.12	0.15 to 8.06	0.91	1.30	0.26 to 6.52	0.75
Social welfare	1	1.3	1.04	0.09 to 12.24	0.97	2.50	0.25 to 25.41	0.44	4	5.3	4.63	0.81 to 26.49	0.08	5.34	1.43 to 19.96	0.01
<b>Education</b>																
Low medium (Ref.)	29	1.1	1						82	3.2	1					
High medium	28	2.9	1.19	0.64 to 2.21	0.58	1.20	0.64 to 2.24	0.56	60	6.2	0.87	0.59 to 1.30	0.50	0.87	0.59 to 1.30	0.51
<b>Age</b>																
18–30 (Ref.)	16	1.2	1						52	4.0	1					
31–35	32	2.0	0.98	0.40 to 2.42	0.96	0.99	0.39 to 2.49	0.98	67	4.2	1.18	0.68 to 2.04	0.56	1.18	0.68 to 2.05	0.57
46–65	9	1.3	1.15	0.53 to 2.49	.72	1.16	0.52 to 2.59	0.71	23	3.4	0.93	0.56 to 1.53	0.76	0.92	0.56 to 1.54	0.76
<b>Gender</b>																
Males (Ref.)	41	1.9	1						86	3.9	1					
Females	16	1.2	0.61	0.32 to 1.17	0.14	0.62	0.32 to 1.19	0.15	56	4.2	0.79	0.53 to 1.18	0.25	0.80	0.54 to 1.19	0.27
	Very severe hostility symptoms						Very severe symptoms composite variable									
	Symptoms		Adj.		p Value	Adj.		Symptoms		Adj.		p Value				
	N	%	OR	95% CI		OR	95% CI	N	%	OR	95% CI					
<b>Groups</b>																
Police officers 1 (Ref.)	2	1.4	1					3	2.1	1						
Police officers 1 (Ref. second column)	5	1.0	0.73	0.14 to 3.79	0.70	1		7	1.4	0.67	0.17 to 2.62	0.56	1			
Bank empl., not victim robbery	28	2.5	1.67	0.38 to 7.31	0.50	2.25	0.83 to 6.12	0.11	51	4.6	2.31	0.70 to 7.64	0.17	3.42	1.50 to 7.78	0.00
Bank empl., victim robbery	9	6.1	4.41	0.92 to 21.20	0.06	5.97	1.92 to 18.54	0.00	19	12.8	7.16	2.04 to 25.10	0.00	10.63	4.31 to 26.21	0.00
Psychiatric hospital empl.	7	3.2	2.40	0.48 to 12.07	0.29	3.23	0.98 to 10.65	0.05	16	7.3	4.02	1.13 to 14.36	0.03	5.95	2.36 to 15.05	0.00
Trainees AT	44	6.2	5.71	1.32 to 24.72	0.02	7.71	2.90 to 20.49	0.00	96	13.5	8.38	2.55 to 27.51	0.00	12.43	5.55 to 27.83	0.00
Soldiers, not deployed before	7	2.5	1.26	0.25 to 6.42	0.78	1.70	0.51 to 5.72	0.39	8	2.9	1.12	0.29 to 4.43	0.87	1.67	0.58 to 4.82	0.34
Soldiers, deployed before	4	1.7	1.02	0.18 to 5.75	0.99	1.38	0.36 to 5.30	0.64	6	2.5	1.10	0.27 to 4.54	0.89	1.64	0.54 to 5.00	0.38
Firefighters	2	1.6	1.07	0.15 to 7.76	0.94	1.49	0.28 to 7.78	0.64	3	2.4	1.11	0.22 to 5.59	0.90	1.66	0.42 to 6.51	0.47
Social welfare	7	9.2	9.20	1.81 to 46.91	0.01	12.57	3.73 to 42.40	0.00	9	11.8	7.68	1.97 to 29.89	0.00	11.41	4.01 to 32.45	0.00
<b>Education</b>																
Low medium (Ref.)	78	3.0	1			1			134	5.2	1					
High medium	37	3.9	0.62	0.39 to 0.99	0.05	0.62	0.39 to 0.99	0.05	84	8.7	0.79	0.56 to 1.10	0.16	0.79	0.56 to 1.10	0.16
<b>Age</b>																
18–30 (Ref.)	53	4.1	1			1			88	6.8	1					
31–35	44	2.8	1.56	0.85 to 2.85	0.15	1.67	0.89 to 3.11	0.11	96	6.0	1.28	0.82 to 2.02	0.28	1.31	0.83 to 2.06	0.25
46–65	18	2.7	0.87	0.49 to 1.54	0.63	0.95	0.52 to 1.72	0.86	34	5.1	0.92	0.60 to 1.39	0.69	0.94	0.61 to 1.44	0.77
<b>Gender</b>																
Males (Ref.)	66	3.0	1			1			130	5.9	1			1		
Females	49	3.6	0.87	0.55 to 1.35	0.53	0.88	0.56 to 1.37	0.56	88	6.5	0.81	0.58 to 1.12	0.20	0.81	0.59 to 1.13	0.22

\*Anxiety and/or depression and/or hostility.

Adj. OR, OR adjusted for all study variables; AT, Assertiveness Training; empl., employee; NA, not applicable because the prevalence of very severe anxiety symptoms among firefighter is zero; Ref., reference group.

to exhibit significantly lower mean scores on the 17-item sum score than employees of supermarkets, while the 2002 sample did not differ significantly from supermarket employees (Police<sup>2002</sup>: M=20.7, SD=5.9; Police<sup>2004</sup>: M=18.9, SD=4.37; Super market: M=22.6, SD=7.28).

## DISCUSSION

We found no indications that subclinical mental health problems, that is, severe symptoms were more prevalent among police officers than among other occupational groups in our comparative study. The same pattern was observed with respect to very severe symptoms, that is, a level of self-reported symptoms that may be indicative of the presence of mental disorders such as generalised anxiety disorder or major depressive disorder. Surprisingly, findings showed that officers in our comparative study were as healthy as study groups that are not considered high-risk professions, such as employees of banks (not victimised by robberies), supermarket employees, mental health-care professionals and soldiers before deployment. Moreover, they strongly differed from employees participating in an RET training because of mental health problems that were associated with a lack of assertiveness. Although we are not aware of a similar multic comparative study, these findings appear to be in line with the outcomes of a Dutch study on burnout among officers showing that officers had lower levels of emotional exhaustion than one large reference group consisting of various occupations,<sup>20</sup> a Norwegian study<sup>1</sup> showing that officers exhibited lower levels of emotional exhaustion (but higher levels of depersonalisation) than physicians, and the outcomes of the aforementioned studies.<sup>8-9</sup> However, these studies did not control or adjust for the possible confounding effects of demographics in contrast to our study.

How can these findings be explained? In the Dutch situation police officers follow a rigorous selection process: about 90% of those applying to the officer training programme is rejected (personal communication Dr Annika Smit, Dutch Police Academy). Moreover, officers are trained to deal and cope with critical incidents and as a consequence may be highly resilient to mental health problems.<sup>21</sup> This may explain why bank employees (not selected to cope with severe incidents nor trained as rigorously as police officers), who were confronted with bank robberies reported significantly more (severe and very severe) mental health disturbances.

Interestingly, in an older prospective study among police officers involved as body handlers in a disaster, no increases in health problems compared with predisaster levels were observed.<sup>22</sup> These findings seriously question the generally held belief that policing is a high-risk profession with respect to mental health: is it perhaps a (partial) myth? Either way, it reminds us of the debate on suicide among officers that once (in fact) has been described as an epidemic.<sup>23</sup> However, the critical review on suicide among officers of Hem *et al*<sup>23</sup> clearly

demonstrated that no evidence of an elevated suicide rate among officers actually exists and that previous research had serious methodological shortcomings.

Despite the strength of our study, that is, multiple comparison groups and controlling for age, gender and education, some possible limitations and characteristics should be discussed. First, although very high scores on the SCL-90-R (very severe symptoms) may be indicative of a mental disorder, we did not conduct clinical interviews to examine the prevalence of mental disorders such as generalised anxiety, major depression and PTSD across samples. Very severe symptoms are considered to be clinically relevant. According to the Dutch norm tables<sup>19</sup> the mean scores of a norm group of psychiatric patients on the subscales anxiety and depression were 26.0 (SD=9.9) and 41.9 (SD=14.8), respectively. In our total sample the mean scores of those with very severe anxiety and depression symptoms were 27.7 (SD=5.2) and 43.3 (SD=8.1), respectively. Therefore, it is not very likely that the prevalence rates obtained from clinician-rated instruments would be (much) higher than the prevalence rates obtained by self-report measures such as the SCL-90-R.<sup>24</sup>

Second, we were not able to compare the prevalence of PTSD across our study samples. Therefore, it is possible that the prevalence of PTSD among police officers is higher than among the other study groups. However, given the marked overlap of PTSD symptoms with other disorders and the typical comorbidity rates of PTSD with for instance depression,<sup>25-26</sup> it is unlikely that police officers with PTSD, did not suffer from other severe mental health disturbances. Indeed, a large study among UK military personnel (N=10 069)<sup>27</sup> showed that 344 of the 394 PTSD cases (87.3%) reported severe mental health problems, that is, were GHQ cases (high scores on the General Health Questionnaire). Only a small group of PTSD cases (N=50, 12.7%) were not identified as being a GHQ case (prof. Roberto Rona, personal communication). Control analyses among another sample (N=67) of Dutch employees seeking treatment at the Institute for Psychotrauma for (probable) PTSD following various traumatic events, showed similar results. In total, 86.6% (N=58) of the (probable) PTSD cases (N=67, Scores on the Impact of Event Scale of 35 or more<sup>28</sup>) also reported very severe mental health problems according to our composite variable of very severe symptoms. These findings are in line with previous research,<sup>29-30</sup> demonstrating that PTSD and SCL-90-R scores are strongly associated. Thus, an increased prevalence rate for PTSD in the absence of marked mental health problems would be highly unlikely.

Third, the two groups of officers were not drawn from national samples of officers. Group 1 was obtained in the eastern part of the Netherlands, but group 2 consisted of officers from several regions in the Netherlands (mainly east, mid and west). We have no data on the non-response of group 1. Although both groups did not differ in prevalence rates of very severe anxiety, depression and hostility

symptoms (ie, clinical level of symptoms), significant differences were found in the prevalence of severe depression symptoms (80th percentile). This may reflect the normal variety of the prevalence of symptoms among subsamples within one occupational group. In addition, table 2 showed that females in our study less often had severe symptoms than males (although the prevalence of very severe symptoms did not differ between both subgroups) while in the general population the opposite is found.<sup>19</sup> However, our study samples do not reflect the general population (see table 1). We used the Dutch norm tables for males and females: the cut-off scores for females are slightly higher than for males to enable such comparisons.<sup>19</sup>

Finally, one could hypothesise that the data of our study groups were not obtained very recently and that for instance the current prevalence of mental health problems among police officers is (much) higher. The data were in fact obtained in the period 1991–2007. It is possible in principle that the stability of the prevalence of assessed clinical and subclinical symptoms varied across the study groups during this period. Therefore we cannot rule out the possibility that for instance mental health problems among police officers increased over these years, while those of bank employees decreased and those of soldiers remained stable. Unfortunately, we are not aware of any study assessing and demonstrating differences in trajectories of prevalence between the study groups over a period of 16 years. However, epidemiological studies among the general population examining 12-month prevalence of mental disorders may shed more light on this issue. Kessler *et al*<sup>31</sup> showed that the 12-month prevalence of any mental disorder was more or less stable over a 10-year period, that is, 29.5% and 26.2%, respectively. With respect to the Netherlands, the NEMESIS study<sup>32</sup> showed similar outcomes: in contrast to the expectations of mental health professionals the 12-month prevalence remained stable at about 17%<sup>33</sup> in a similar period. These important results suggest that, although the studies were conducted among the general population, it is more likely that the prevalence of assessed mental health problems was relatively stable and did not differ significantly across occupational groups over time.

Participants of all 11 study groups were inhabitants of the Netherlands. Therefore, future research is warranted to examine to what extent our findings can be generalised to countries with different political, social, medical and legal systems, and selection and training procedures of officers. We were not able to control for other influential factors such as organisational characteristics. Finally, we did not examine the extent of substance use such as the consumption of alcohol and smoking. Although the outcomes of Sterud *et al*<sup>34</sup> did not support the notion of a strong relationship between occupational stress and alcohol use in police officers, it is unclear as to whether alcohol use differs from the other groups in our study.

## CONCLUSIONS

Despite these limitations, the present study demonstrates that, although policing is generally viewed as a high-risk profession, mental health disturbances are not more prevalent in police officers as compared with various other occupational cohorts in our study. Several of these groups such as bank employees (not being robbed) and supermarket employees, as well as soldiers before deployment are typically not considered to be 'high-risk professions'. These findings suggest that the positive effects on the mental health of police officers of the selection process, self-selection and resilience, given the amount of potential stressful and traumatic events they encounter during their career, should not be underestimated.

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## APPENDIX A1

Table A1



**Table A1** Bivariate associations between predictors and dependent variables

	Severe anxiety symptoms				Severe depression symptoms				Severe hostility symptoms				Severe symptoms composite			
	OR	p Value	OR	p Value	OR	p Value	OR	p Value	OR	p Value	OR	p Value	OR	p Value	OR	p Value
<b>Groups</b>																
Police officers 1 (Ref.)	1				1				1				1			
Police officers 2 (Ref. second column)	0.53	0.13	1		0.41	0.01	1		0.56	0.07	1		0.49	0.01	1	
Bank employees, not victim robbery	1.16	0.68	2.21	0.00	1.02	0.94	2.51	0.00	1.25	0.43	2.22	0.00	1.22	0.38	2.49	0.00
Bank employees, victim robbery	4.14	0.00	7.89	0.00	1.98	0.04	4.86	0.00	2.03	0.03	3.62	0.00	2.25	0.00	4.59	0.00
Psychiatric hospital employees	1.68	0.21	3.19	0.00	1.47	0.22	3.61	0.00	1.22	0.55	2.17	0.00	1.41	0.20	2.89	0.00
Trainees AT	4.40	0.00	8.38	0.00	4.24	0.00	10.41	0.00	3.69	0.00	6.56	0.00	3.90	0.00	7.96	0.00
Soldiers, not deployed before	0.98	0.96	1.86	0.08	0.58	0.12	1.42	0.25	2.02	0.02	3.59	0.00	1.41	0.18	2.88	0.00
Soldiers, deployed before	0.80	0.63	1.53	0.27	0.62	0.18	1.52	0.19	1.83	0.05	3.26	0.00	1.28	0.35	2.62	0.00
Firefighters	0.64	0.43	1.21	0.71	1.12	0.77	2.74	0.00	1.28	0.50	2.28	0.01	1.16	0.64	2.36	0.00
Social welfare	3.10	0.01	5.90	0.00	2.15	0.04	5.29	0.00	2.31	0.03	4.10	0.00	1.73	0.10	3.54	0.00
<b>Education</b>																
Low medium	1				1				1				1			
High medium	1.70	0.00	1.63	0.00	2.18	0.00	2.15	0.00	1.34	0.00	1.31	0.01	1.63	0.00	1.60	0.00
<b>Age</b>																
18–30	1				1				1				1			
31–35	0.89	0.43	0.83	0.25	0.89	0.36	0.83	0.16	1.17	0.23	1.14	0.31	1.21	0.09	1.15	0.22
46–65	0.96	0.79	0.93	0.63	1.01	0.95	0.96	0.73	1.11	0.39	1.12	0.39	1.12	0.29	1.09	0.44
<b>Gender</b>																
Males	1				1				1				1			
Females	0.86	0.19	0.85	0.18	0.87	0.13	0.85	0.10	0.64	0.00	0.63	0.00	0.79	0.00	0.78	0.00
			Very severe anxiety symptoms				Very severe depression symptoms				Very severe hostility symptoms				Very severe symptoms composite	
<b>Groups</b>																
Police officers 1 (Ref.)	1				1				1				1			
Police officers 2 (Ref. second column)	0.43	0.35	1		0.86	0.85	1		0.71	0.69	1		0.66	0.56	1	
Bank employees, not victim robbery	0.58	0.49	1.36	0.65	1.97	0.36	2.30	0.07	1.83	0.41	2.57	0.05	2.26	0.18	3.40	0.00
Bank employees, victim robbery	3.53	0.12	8.27	0.00	6.84	0.01	7.98	0.00	4.60	0.05	6.45	0.00	6.92	0.00	10.44	0.00
Psychiatric hospital employees	0.33	0.36	0.77	0.82	4.48	0.05	5.23	0.00	2.34	0.29	3.29	0.04	3.70	0.04	5.59	0.00
Trainees AT	3.35	0.10	7.87	0.00	7.64	0.01	8.92	0.00	4.69	0.03	6.58	0.00	7.35	0.00	11.08	0.00
Soldiers, not deployed before	0.51	0.51	1.21	0.84	0.26	0.27	0.30	0.27	1.83	0.45	2.57	0.11	1.39	0.63	2.10	0.16
Soldiers, deployed before	0.00	1.00	0.00	1.00	0.61	0.62	0.71	0.67	1.22	0.82	1.72	0.42	1.23	0.78	1.85	0.27
Firefighters	0.00	1.00	0.00	1.00	1.17	0.87	1.37	0.70	1.17	0.87	1.65	0.55	1.18	0.85	1.77	0.41
Social welfare	0.95	0.97	2.22	0.49	3.94	0.12	4.60	0.02	7.20	0.02	10.10	0.00	6.31	0.01	9.52	0.00
<b>Education</b>																
Low medium	1				1				1				1			
High medium	2.65	0.00	2.71	0.00	2.04	0.00	1.98	0.00	1.29	0.21	1.26	0.26	1.76	0.00	1.71	0.00
<b>Age</b>																
18–30	1				1				1				1			
31–35	0.92	0.83	0.93	0.87	1.17	0.53	1.10	0.70	1.54	0.12	1.57	0.12	1.36	0.14	1.30	0.22
46–65	1.50	0.28	1.54	0.28	1.23	0.40	1.19	0.49	1.03	0.93	1.09	0.78	1.20	0.38	1.18	0.43
<b>Gender</b>																
Males	1				1				1				1			
Females	0.63	0.13	0.64	0.13	1.07	0.71	1.05	0.80	1.22	0.30	1.21	0.33	1.12	0.45	1.09	0.54

Ref., reference group.