

Suicide in Police Work: Exploring Potential Contributing Influences

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Abstract Police officers are considered at increased risk for suicide. The objective of this study was to explore potential influences on suicide ideation among 105 randomly selected men and women urban police officers. Depression, gender, and marital status appeared to be most strongly associated with police suicidal ideation. Depressive symptoms were higher among women than men officers (12.5 percent vs. 6.2 percent). For each standard deviation increase in depressive symptoms, the prevalence ratio (PR) of suicide ideation increased 73 percent in women (PR=1.73, 95% CI=1.32–2.27) and 67 percent in men (PR=1.67, 95% CI=1.21–2.30). The association between depression and ideation was stronger among unmarried women officers (PR=4.43; 95% CI=2.19 – 8.91) than married women officers (PR=1.39, 95% CI=1.09 – 1.79). While depression has previously been associated with suicide, such results are unusual in a healthy working population such as the police.

Keywords Police · Suicide · Depression · Gender · Occupational stress

Introduction

Previous evidence suggests that police officers are at increased risk for suicide (Violanti 2004; Violanti et al. 1998, 2006; Kposowa 1999; Charbonneau 2000; Darensburg et al. 2006; Hartwig and Violanti 1999). The National Association of

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Chiefs-of-Police states that police officers have a two-fold greater risk of killing themselves over being killed by a criminal (Violanti 1996). Vena and colleagues (1986) found that Buffalo, NY, police officers had a three-fold risk of suicide compared to a control group of municipal workers (Violanti et al. 1986). Additionally, an updated 40-year Buffalo, NY police cohort found officers had a significantly higher risk for suicide (Standardized Mortality Ratio=156) than the general U.S. population, which includes the non-employed and institutionalized (Violanti et al. 1998).

Further inquiry is necessary to help clarify precipitating factors or exacerbating conditions which account for unexplained variance in police suicide rates (Hem et al. 2001; Marzuk et al. 2002). One strategy would be to examine premorbid personal and occupational factors that increase suicide risk (Gershon et al. 2002). Depression and suicide ideation are considered psychological risk factors for suicide (Kessler et al. 1999, 2005) and it has been suggested that both factors be examined in police officers (Berg et al. 2003)

Suicide Ideation

Suicide ideation is an important risk factor for attempted and completed suicide (Morgan and Stanton 1997; Young et al. 1998; Lynch et al. 1999; Lyon et al. 2000; Nugent and Willams 2001). Ideation is a form of suicidal behavior and places a person at greater risk for suicide (Jacobs 1989). Kessler et al. (1999) found that 13.5% of respondents in the National Comorbidity Study (NCS) reported lifetime suicide ideation. Fawcett et al. (1993) and Gili-Planas et al. (2001) estimated that more than 60% of patients who eventually commit suicide present with prior suicide ideation, and that approximately 90% of unplanned and 60% of planned suicide attempts occurred within one year of the onset of ideation. Even low levels of suicide ideation significantly increase the risk of substantial ideation or a suicide attempt (Young et al. 1998). In a national study, 25% of ideators planned suicide and 8% made an actual attempt (Crosby et al. 1999).

Gender and marital status have been strongly associated with suicide in patients with major depressive disorder (Dumais et al. 2005). Several studies have observed differences in suicidal behavior between men and women. Men have higher rates of suicide, while women have higher risk of suicide attempts (Oquendo et al. 2001; Molnar et al. 1998). Casey et al. (2006) found that lack of help was associated with increased suicidal thoughts in women who experienced negative life events, but in men lack of help did not influence suicidal ideation. Oquendo et al. (2007) found positive associations between risk for suicidal acts and depression, suicidal ideation, and hostility in women but not in men. Marriage has been identified as a protective factor against suicide ideation and suicide (Berg et al. 2003; Casey et al. 2006; Qin et al. 2003).

Rothman and Strijdom (2002) found suicide ideation in South African Police to be associated with a sense of incoherence. Officers were unable perceive traumatic police work exposures as manageable. They did not feel that they had the resources available, either personally or organizationally, to meet the demands imposed upon them by their difficult work. In a nationwide study on suicide ideation and attempts among 3272 Norwegian police, 24% felt that life was not worth living, 6.4% seriously considered suicide, and 0.7% attempted suicide (Berg et al. 2003). Serious

suicide ideation was mainly attributed to personal and family problems. Violanti (2004) found that certain traumatic police work exposures increased the risk of having a high level of posttraumatic stress disorder (PTSD) symptoms, which subsequently increased the risk of alcohol use and suicide ideation. The combined impact of PTSD and increased alcohol use led to a ten-fold increased risk of suicide ideation.

Depression and Suicide Ideation

Depression is considered a significant predictor of suicide ideation (DeFilippo and Overholser 2000). Crosby and Sacks (2002) suggested that suicide ideation, planning suicide, and suicide attempts were more likely to occur when individuals are exposed to the suicide of another person. Because police officers often investigate suicides, they may have greater exposure than the general population. Physical assault victimization, which may also occur on police duty, has been positively associated with suicidal ideation (Simon et al. 2002). Joiner and Rudd (1995) examined the effects of depression with six other psychological maladies and found that these factors combined increased the severity of suicide ideation. Other researchers have found that depression and anxiety interactively increase the likelihood of suicide ideation (Rudd et al. 1993). Depression and alcohol abuse may also increase suicide ideation (Bonger 1991). Many persons diagnosed with depression have comorbid difficulties (Green et al. 1989). Hartley et al. (2007) examined the effects of both traumatic work and external life events on depression among police officers. Their results indicated that exposure to multiple negative life events is significantly associated with elevated depression scores in officers.

Despite research evidence that police officers are at increased risk for suicide, and that depression and suicide are correlated, a review of literature revealed relatively few studies that have specifically examined depression as a correlate of suicide among police officers. In this study, we hypothesized that 1) depression is associated with suicide ideation among police officers, 2) this association will be different between men and women officers, and 3) marriage will be protective in the association between depression and suicide ideation.

Methodology

This cross-sectional study involved 115 randomly selected police officers from a mid-sized urban police department of 930 officers. The random sample, stratified by gender, was developed from all officers in the department using a computer-generated random number table. Women officers were over-sampled to help ensure adequate representation. The Center for Preventive Medicine in the School of Public Health and Health Professions, State University of New York, served as the site for data collection. A comprehensive set of questionnaires (self- and interviewer-administered) and a variety of physical measures were included in the examination that took place between 1999 and 2000. Of the 115 officers, 105 had complete information available. The 105 officers with complete data were similar to the 10 officers who had incomplete data with respect to age, gender, education, marital

status, police rank, smoking status and alcohol intake, but not with respect to years of police service where those with complete data had greater service duration. No specific inclusion criteria were indicated for the study, other than the participant was a sworn police officer and willing to participate in the study. One hundred percent of the random sample generated voluntarily agreed to participate in the study.

Measures

Depressive Symptoms

The Center for Epidemiological Depression (CES-D) scale is a 20-item measure of depressive symptoms. Participants were asked to rate items on a 4-point scale according to how often the symptom occurred in the past 7 days: 1 (rarely or none of the time, less than 1 day), 2 (some or little of the time, 1–2 days), 3 (occasionally or a moderate amount of the time, 3–4 days), and 5 (most of all of the time, 5–7 days). Scores for the CES-D range from 0 to 60. Respondents with scores between 0–15 are considered unlikely to be clinically depressed (Radloff 1977), and a score of 16 or higher has been used to indicate presence of depression (McDowell and Newell 1996). The CES-D has acceptable reliability (Chronbach alpha of 0.85), and a split-half reliability ranging from 0.76 to 0.85 (Radloff 1977).

Suicide Ideation

This measure was obtained at the same time period as the CES-D. Suicide ideation was assessed using a dichotomous response (yes-no) to a question: “Have you ever thought about suicide?” adopted from a preliminary screening question on the Beck Suicide Ideation Scale (Beck and Steer 1993). The study was limited only to suicide ideation.

Demographic and Lifestyle Characteristics

Questionnaires were used to ascertain demographic characteristics including years of education, marital status, years of police service, and police rank. Given small numbers in some categories of police rank, sergeants and lieutenant, and captains and detectives were grouped together respectively. Officers were categorized as current, former and never smokers, and alcohol intake was based on the number of drinks reported per week using categories of 0, <1, 1–6, and > 6 drinks per week.

Statistical Analyses

All analyses were performed separately for men and women officers. Mean CES-D scores were compared across demographic and lifestyle characteristics using analysis of variance and tests for trend. Prevalence of suicide ideation was compared across levels of these demographic and lifestyle characteristics using Chi-square tests and tests for trend for ordinal variables.

Poisson regression was used to determine the association of CES-D score with suicide ideation by calculating prevalence ratios (PR) and their associated

confidence intervals (CI). Prevalence ratios are appropriate and more meaningful than odds ratios where the disease of interest is not rare (e.g., larger than 10 percent) (Spiegelman and Hertzmark 2005). Poisson regression, using SAS PROC GENMOD and an empirical variance correction, leading to robust variance estimates, is a preferred method for estimating prevalence ratios (Spiegelman and Hertzmark 2005). Poisson regression is used here to overcome the fact that log-binomial regression, which also produces prevalence ratios, often does not converge while Poisson regression does. The Poisson model produces valid estimates of the prevalence ratio with slightly wider or more conservative confidence intervals. The robust variance estimator, available in SAS PROC GENMOD, provides an empirical variance correction to adjust the variance estimates and account for the misspecification inherent in using the Poisson rather than the binomial model.

A regression model was fit separately for men and women. PR's and 95% CI's reflected a percentage change in prevalence of suicide ideation based on a one standard deviation (SD) increase in the CES-D score (SD in women=8.4; SD in men=5.6). Unadjusted, age-adjusted and age- and education-adjusted models were calculated. Analyses were also stratified by marital status and a test for interaction between CES-D score and marital status was performed to assess potential effect modification by marital status.

Results

Prevalence of suicide ideation was similar among women (25.0%) and men (23.1%), whereas prevalence of depression (CES-D cutoff score of ≥ 16) was two times higher among women than among men (12.5% vs. 6.2%).

Demographics

Mean depression scores by levels of demographic and lifestyle characteristics are summarized in Table 1. There was a tendency for overall mean depression scores to increase with age and years of service, although these trends were not significant. For male officers, a marginally significant trend ($p=0.059$) was found for education, with depression scores decreasing as educational level increased. Also, a significant difference between mean depression scores ($p=0.007$) across marital status categories was found among male officers, with divorced male officers having higher mean levels of depression.

Table 2 summarizes the prevalence of suicide ideation by demographic characteristics. Women officers showed a significant increasing trend in suicide ideation with increasing age ($p=0.012$) and years of service ($p=0.027$). For male officers, a significant decreasing trend in suicide ideation trend was found as education level increased ($p=0.0005$).

Depression and Suicide Ideation

Results in Table 3 suggested that the mean depression score for all officers with suicide ideation was significantly higher than for those without suicide ideation

Table 1 Mean depression score by levels of demographic and lifestyle characteristics

Characteristics	Women			Men			All			
	N	Mean	SD	N	Mean	SD	N	Mean	SD	
Race										
White	30	8.7	9.3	45	6.2	4.5	75	7.2	6.9	
Black	10	5.8	4.0	12	8.3	8.0	22	7.1	6.5	
Hispanic	0	0.0	0.0	8	7.6	7.6	8	7.6	7.6	
p-value ⁺		0.3483			0.5141			0.9842		
Age group (years)										
26–34	12	6.8	5.0	16	6.1	4.8	28	6.4	4.8	
35–44	22	7.5	8.6	26	7.1	6.9	48	7.3	7.6	
≥45	6	12.2	12.4	23	6.9	4.7	29	8.0	7.1	
p-value [#]		0.2106			0.6657			0.3867		
Education										
≤High school/GED	6	6.8	6.9	14	9.1	6.6	20	8.4	6.6	
College <4 yrs	13	8.1	8.3	18	6.9	6.4	31	7.4	7.1	
College 4+ yrs	21	8.2	9.1	33	5.7	4.5	54	6.7	6.7	
p-value [#]		0.7250			0.0595			0.3339		
Marital status										
Single	12	7.1	4.6	11	3.5	4.1	23	5.3	4.6	
Married	19	8.3	10.1	48	7.0	5.4	67	7.3	7.0	
Divorced	9	8.6	8.8	6	11.0	7.0	15	9.5	8.0	
p-value ⁺		0.6985			0.0076			0.1731		
Years of service										
1–5	10	6.2	4.0	11	5.5	4.8	21	5.8	4.3	
6–10	9	6.6	5.0	7	7.3	4.1	16	6.9	4.5	
11–15	11	9.6	8.0	18	6.8	6.9	29	7.9	7.3	
15 +	10	9.2	13.6	29	7.1	5.6	39	7.6	8.2	
p-value [#]		0.3241			0.5044			0.2786		
Smoking status										
Current	11	8.4	6.2	10	5.7	4.3	21	7.1	5.4	
Former	14	7.0	9.5	17	8.2	5.8	31	7.7	7.6	
Never	15	8.6	9.0	37	6.4	6.0	52	7.0	6.9	
p-value ⁺		0.9448			0.7292			0.9143		
Rank										
Police officer	31	6.4	5.1	38	6.2	6.1	69	6.3	5.6	
Sergeant/Lieutenant	6	12.7	12.4	8	5.9	5.1	14	8.8	9.2	
Captain/Detective	3	14.7	20.4	18	8.2	5.0	21	9.1	8.2	
p-value ⁺		0.0837			0.4360			0.1647		
Alcohol drinks/week										
0	13	7.3	4.7	14	8.6	7.2	27	8.0	6.0	
<1	12	9.7	9.8	10	5.2	4.3	22	7.6	8.0	
1–6	9	10.1	11.9	30	6.3	5.7	39	7.2	7.6	
≥6	6	2.8	2.6	11	7.0	4.2	17	5.5	4.2	
p-value [#]		0.3183			0.6183			0.2447		

⁺ ANOVA (test of differences in means) [#] Test for trend

(12.5±9.3 vs. 5.6±4.6, $p=0.0001$). Among women officers, the mean depression score was nearly three times higher for those with suicide ideation as it was for those without ideation (15.3±13.1 vs. 5.5±4.0; $p=0.0007$). Among male officers, the mean depression score was nearly twice as high for those with suicide ideation as it was for those without ideation (10.7±5.5 vs. 5.6±5.2; $p=0.0016$).

Table 2 Prevalence of suicide ideation by demographic and life style characteristics, and gender

Characteristics	Women			Men		
	N	%	p- value	N	%	p- value
Race						
White	30	30.0	0.4011 ⁺	45	22.2	0.5353 ⁺
Black	10	10.0		12	16.7	
Hispanic	0	0.0		8	37.5	
Age group (years)						
26–34	12	8.3	0.0120 [#]	16	25.0	0.5353 [#]
35–44	22	22.7		26	26.9	
≥45	6	66.7		23	17.4	
Education						
≤High school/GED	6	50.0	0.1695 [#]	14	57.1	0.0005 [#]
College <4 yrs	13	23.1		18	22.2	
College 4+ yrs	21	19.1		33	9.1	
Marital status						
Single	12	8.3	0.1988 ⁺	11	27.3	0.6914 ⁺
Married	19	36.8		48	20.8	
Divorced	9	22.2		6	33.3	
Years of service						
1–5	10	0.0	0.0274 [#]	11	27.3	0.5956 [#]
6–10	9	22.2		7	28.6	
11–15	11	36.4		18	22.2	
>15	10	40.0		29	20.7	
Smoking						
Current	11	27.3	0.9033 ⁺	10	20.0	0.4649 ⁺
Former	14	28.6		17	35.3	
Never	15	20.0		37	18.9	
Rank						
Police officer	31	19.4	0.1169 ⁺	38	21.1	0.4801 ⁺
Sergeant/Lieutenant	6	33.3		8	12.5	
Captain/Detective	3	66.7		18	33.3	
Alcohol drinks/week						
0	13	7.7	0.4882 [#]	14	28.6	0.1628 [#]
<1	12	41.7		10	40.0	
1–5	9	33.3		30	20.0	
≥6	6	16.7		11	9.1	

⁺ Chi-square test # Test for linear trend

Table 4 provides prevalence ratios for associations between depression and suicide ideation by gender. For each standard deviation increase in the depression score, the prevalence of suicide ideation increased by 73% in women (PR=1.73, 95% CI=1.32–2.27) and 67% in men (PR=1.67, 95% CI=1.21–2.30). Adjustment for age and education did not appreciably attenuate this association.

Table 5 summarizes associations between depression and suicide ideation, stratified by marital status separately for men and women officers (married or unmarried). Poisson regression models were used to assess the role of marital status as an effect modifier between depression and suicide ideation. A significant interaction was found between depression and marital status ($p=0.0025$) with a stronger association observed in unmarried women officers (PR=4.43, 95% CI=2.19–8.97) than among married women officers (PR=1.39, 95% CI=1.09–1.79).

Table 3 Mean depression score by suicide ideation

Gender	Suicide ideation						p-value
	Yes			No			
	N	Mean	SD	N	Mean	SD	
Women	10	15.3	13.1	30	5.5	4.0	0.0007
Men	15	10.7	5.5	50	5.6	5.2	0.0016
All	25	12.5	9.3	80	5.6	4.6	<0.0001

These results suggest that the increase in prevalence of suicide ideation per standard deviation increase in depression is significantly smaller for married than for unmarried women officers. In contrast, associations were of similar magnitude among married and unmarried men officers.

Discussion

While it is commonly accepted that depression and suicide ideation are related (Kessler et al. 2005), this is one of the first analysis of this relationship in police work. This result is unusual in a healthy and psychologically tested work population such as the police (Li and Sung 1999). In general, suicide ideation and depression should only be considerably higher in non-working and institutionalized populations. (Kessler et al. 2005).

Equally interesting is the result that women officers are more prone to depressive symptoms than male officers. There is a paucity of psychological research presently available for women officers. The prevalence of suicide ideation for both women (25%) and men (23.1%) police officers in this sample is somewhat elevated above the general United States population estimate of approximately 13.5% (Kessler et al. 1999). Results also indicated a higher prevalence of depression in officers (12.5% for women and 6.2% for men officers) compared to 7.4% among women and 2.8% among men who participated in the National Institute of Mental Health Epidemiologic Catchment Area Study (Weissman et al. 1996). However, depression was lower among these officers than among participants in the Framingham Heart Study (17% of women and 10% of men) (Wulsin et al. 2005). The higher prevalence of

Table 4 Prevalence ratios for the association between depression score and suicide ideation by gender

	Unadjusted			Age-adjusted			Age and education-adjusted		
	PR	95% CI	p-value	PR	95% CI	p-value	PR	95% CI	p-value
Women	1.73	1.32–2.27	<0.0001	1.57	1.23–2.02	0.0003	1.73	1.23–2.43	0.0015
Men	1.67	1.21–2.30	0.0020	1.67	1.20–2.34	0.0025	1.42	1.07–1.89	0.0144

PR=prevalence ratio; CI=confidence interval

Prevalence ratios and 95% confidence intervals were obtained from Poisson regression models and reflect a percentage change in prevalence of suicide ideation based on a one standard deviation (SD) increase in CES-D score (SD in women=8.4 and in men=5.6).

Table 5 The association between depression score and suicide ideation by gender and marital status

	Women					Men				
	N	Prevalence (%)	PR	95% CI	P-value	N	Prevalence (%)	PR	95% CI	P-value
Married	19	36.8	1.39	1.09–1.79	0.0093	48	20.8	1.56	1.03–2.36	0.0354
Unmarried	21	14.3	4.43	2.19–8.97	<0.0001	17	29.4	1.85	1.26–2.69	0.0015

Prevalence (%)=prevalence of suicide ideation

PR=prevalence ratio; CI=confidence interval

Prevalence ratios and 95% confidence intervals were obtained from Poisson regression models and reflect a percentage change in prevalence of suicide ideation based on a one standard deviation (SD) increase in CES-D score (SD in women=8.4 and in men=5.6).

depression for women officers compared to male officers in this study is consistent with findings from population studies (Kessler et al. 1999; Wunderlich et al. 2001).

Officers reporting suicide ideation had significantly higher mean depression scores than officers without suicide ideation. This finding is consistent with other studies (DiFilippo and Overholser 2000; Claasen et al. 2007; Marttunen et al. 1991; Dumais et al. 2005; Storosum et al. 2001). Among officers with suicide ideation, the mean depression score was higher for women than men. Oquendo et al. (2007) found that depressive symptoms increased the risk of future suicidal acts among women but not in men.

There has been some research focused on identifying the causes of police depression, however, most of this research had been conducted with largely male samples (Morash and Haarr 1995; Pierino 2007). This is problematic because it makes the assumption that men and women have the same causes and reactions to stressful events. The present study suggests the need to further explore the psychological impact of police work on women.

On the positive side, marriage appears to have a protective effect against the adverse effects of depression on suicide ideation for women officers. Our results suggested that the increase in the prevalence of suicide ideation based on one standard deviation increase in CES-D is significantly smaller for married than for unmarried women officers. It is generally accepted in the suicide literature that marriage has a protective effect against suicide. In the United States, married persons have the lowest suicide rate across all age categories and marriage tends to protect against suicide (Maris 1981). Suicide rates were highest in the Maris (1981) study for the unmarried with divorced persons having the highest rate. Nisbet (1996) found that certain groups who had low suicide rates had strong social support systems in place, despite family disruption and depression.

Among women, the protective effect of marriage has been associated with having children, particularly children under the age of two (Qin et al. 2003). Women officers may feel more responsibility for the rearing of their young children. Additionally, there may be work-related social factors which account for the protective aspect of marriage for police women. Women officers may tend to feel more isolated in the male dominated police work environment, and family life becomes a stronger source

of social support (Maris et al. 2000). Pierino (2007) found that married policewomen reported significantly less depression than population controls. This finding is also consistent with Patterson's (2003) finding that women police officers depend a great deal on close family interaction to help alleviate stress at work.

There are limitations in this study. The cross-sectional study design limits establishing a temporal relationship between depression and suicide ideation, thus direction of associations and causality cannot be established. Both depression symptomatology and suicide ideation were assessed via self-report measures, which potentially introduces report and recall bias. The widely used CES-D scale focuses on the past seven days, while assessment of suicide ideation could have been directed at any past occurrence. However, the ideation assessment was obtained at the same time as the CES-D. These sources of potential bias are likely to have led to a conservative estimate of associations observed. A larger sample size would enable greater precision in the prevalence ratio estimates, particularly when examining other work characteristics that may modify the association between depression and suicide ideation among men and women police officers.

Conclusion

In sum, the present study indicated that depression and gender were positively associated with suicide ideation in police officers. The findings also suggest that marital status modified the association between depression score and suicide ideation in women officers, with a notably stronger association in unmarried women officers than in married women officers. Suicide ideation and completed suicide are complex processes brought about by many external and internal influences. We have touched upon only but two of them in this occupation of policing. Future work should include prospective analysis of the impact of police work over time on depression and pathways to suicide. In the interim, police organizations could consider further development of psychological employee assistance programs to help officers successfully deal with occupational factors that may lead to stress, depression, suicide ideation, and potential completed suicide.

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