

Physical fitness, absenteeism and workers' compensation in smoking and non-smoking police officers

By: Robert W. Boyce, [Michael A. Perko](#), Glenn R. Jones, Ann H. Hiatt, and Edward L. Boone

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Abstract:

Background: Employers seek to minimize business costs by creating conditions of employment. Relying on the presumably negative effects of smoking on variables such as workers' compensation claims, absenteeism and physical fitness scores, they seek a rational basis for requirements that employees refrain from smoking. No research has been found on police officer smoking rates relating to physical fitness, and the resulting economic variables of workers' compensation claims and absenteeism rates.

Aims: To compare police officer non-smoker and smoker physical fitness, absenteeism rates and workers' compensation claims.

Methods: The sample included 514 officers of a metropolitan police department. A physical fitness test was administered. Smoking status, yearly absenteeism rates and workers' compensation claims were collected.

Results: Male smokers were significantly older than non-smokers. An analysis of covariance controlling for sex and age indicated that smokers had significantly ($P \leq 0.05$) lower fitness scores in sit and reach flexibility, sit-ups endurance, bench press strength and bicycle ergometer cardiovascular endurance. When neither age nor sex was controlled in males, a similar trend continued. However, in females only the sit and reach and sit-up tests demonstrated statistically significant differences. Fat percentage, step-test scores, absenteeism rates and workers' compensation claims were not statistically different.

Conclusion: These data do not provide a rational basis for the requirement that officers refrain from smoking when considering body fat and the economic savings of lower absenteeism rates and workers' compensation. To some extent, smoking policies can be justified by officers' physical fitness but there are age, gender and test protocol considerations.

Key words: Absenteeism; conditions of employment; cost; insurance; physical fitness; police; rational basis; smoking; workers' compensation.

Article:

Introduction

Employers seek to minimize business costs by creating conditions of employment [1,2]. Relying on the presumably negative effects of smoking [3-7] on variables such as workers' compensation claims, absenteeism and physical fitness scores, they seek a rational basis for requirements that employees refrain from smoking. We found no research conducted on police officer smoking status in relation to physical fitness abilities, worker compensation claims and absenteeism rates that would provide a rational basis for department policies concerning smoking.

The purpose of this study was to compare non-smokers and smokers in a metropolitan police department. Specifically, the research questions were (i) do police officers who smoke have different descriptive characteristics (sex, age, rank and race) from those who do not smoke? (ii) Do police officers who smoke have different physical fitness scores from those who do not smoke? (iii) Do police officers who smoke have different absenteeism rates and workers' compensation claims from those who do not smoke?

Methods

The sample included 514 police officers who were required to take an annual battery of five physical fitness tests [8]. Physical fitness data used in the present study were obtained from May 1988 to July 1989. The

absenteeism rate was determined by the payroll sick days taken for the calendar year. Sick days accrued at the rate of one per month. The workers' compensation claims were dollars paid to the employee for accidents that occurred to the employee during working hours.

The physical fitness battery included five measurements: percent body fat, sit and reach flexibility, sit-ups, one repetition maximum bench press and the Queens College step test for those 34 years and younger and a YMCA bicycle ergometer evaluation for those 35 years and older. The unit of measure of the step test was recovery heart rate, and predicted maximum oxygen consumption for bicycle ergometer [8].

The Statistical Program for Social Science was used to analyze the data. A Chi-square and analysis procedures were used to test whether non-smokers and smokers were different on the descriptive characteristics of sex, rank, race and age. Also, one-way analysis of variance procedures were computed to determine if there were differences in age and gender among officers categorized by non-smokers and smokers. Then, a series of analysis of covariance (ANCOVA) procedures controlled for age were computed for males and females separately to determine if non-smokers and smokers differed in physical fitness scores, absenteeism rates and workers' compensation claims. Similarly, a series of ANCOVA procedures was computed comparing non-smokers and smokers controlling for sex and age.

Results

Overall, 405 (79%) officers were non-smokers and 108 (21%) were smokers, 78 white and 20 black, mean age was 34.8 years. In comparing non-smokers and smokers, there were no significant differences in regard to sex, rank and race. Male officers who smoked were significantly older than non-smokers, 34.8 versus 38.7 years ($n = 435$), $P < 0.001$. However, no significant age differences were found between non-smoker and smoker females, 30.3 versus 30.4, respectively ($n = 78$), $P = 0.95$ (see Table 1).

Table 1. Sex, rank, race and age comparisons of non-smoker and smoker officers

Variable	Non-smoker	Smoker	Significance
Sex			
Males	80% ($n = 346$)	20% ($n = 89$)	Chi-square = 0.60 (1, $n = 513$), $P = 0.44$
Females	76% ($n = 59$)	24% ($n = 19$)	
Rank			
Patrol officer	79% ($n = 331$)	21% ($n = 88$)	Chi-square = 0.08 (1, $n = 514$), $P = 0.77$
Sergeant and above	78% ($n = 75$)	22% ($n = 20$)	
Race			
White	79% ($n = 314$)	21% ($n = 83$)	Chi-square = 0.02 (1, $n = 513$), $P = 0.88$
Black	79% ($n = 91$)	21% ($n = 25$)	
Age (years)			
Males			
Mean	34.8 ($n = 346$)	38.7 ($n = 89$)	$F = 15.9$ (1, $n = 435$), $P < 0.001$
SD	8.1	8.2	
Females			
Mean	30.3 ($n = 59$)	30.4 ($n = 19$)	$F = 0.004$ (1, $n = 78$), $P = 0.95$
SD	5.4	6.6	

ANCOVA procedures controlling for sex and age resulted in smokers having significantly lower scores in sit and reach flexibility ($F = 6.49$, $n = 504$, $P = 0.01$), sit-ups endurance ($F = 19.15$, $n = 503$, $P = 0.001$), bench press strength ($F = 4.61$, $n = 498$, $P = 0.03$) and bike cardiovascular endurance ($F = 10.27$, $n = 218$, $P = 0.002$). No significant differences were found in fat percentage ($F = 0.009$, $n = 507$, $P = 0.92$), step-test cardiovascular endurance ($F = 1.08$, $n = 267$, $P = 0.18$), absenteeism rate, ($F = 0.43$, $n = 512$, $P = 0.52$) and workers' compensation claims ($F = 1.075$, $n = 512$, $P = 0.30$). Similar trends were found when analyzing men controlling for their age (see Table 2). When neither age nor sex was controlled in males, the same trend continued; however, sit and reach and bench press were only marginally significant ($P < 0.06$).

There were no statistically significant differences for females in three of the five physical fitness parameters. Only the sit and reach and sit-up tests demonstrated statistically significant differences (see Table 2).

There was no significant difference in body fat for males and females when controlling for age and sex together and when there was no age control (see Table 2). However, when controlling for age only, significant differences were observed. The percent fat for male smokers was only 1–2% more than the non-smokers, and the female smokers had ~1 % less fat than the non-smokers.

The economic variables of absenteeism rates, and workers' compensation claims for males or females when controlling for age showed no significant differences between non-smokers and smokers ($P \leq 0.05$). It is worth mentioning that when controlling for age in men only, absenteeism rates' P value was close to the $P \leq 0.05$ level of significance ($P = 0.06$).

Table 2. Physical fitness, absenteeism and workers' compensation comparisons of non-smoker and smoker officers

Variable	Main effects				F	P	Covariate age	
	Non-smoker		Smoker				F	P
	Mean	n	Mean	n				
Sit and reach (in)								
Male	17.4	342	16.5	85	3.8	0.05	55.6	0.000
Female	19.9	59	18.5	19	4.6	0.03	6.5	0.01
Sit-ups (repetitions/min)								
Male	47.2	341	39.0	85	14.2	0.00	206.8	0.000
Female	44	59	38	19	4.8	0.03	12.5	0.001
Bench press (wt/body wt)								
Male	179.0	336	161.0	85	3.7	0.06	67.7	0.000
Female	84	59	80	19	1.5	0.23	0.4	0.51
Fat (%)								
Male	19	342	20	89	0.2	0.89	113.6	0.000
Female	27	58	26	19	0.1	0.74	12	0.001
Step ^a (beats/15 s)								
Male	35	186	36	27.0	22.2	0.14	0.1	0.79
Female	39	41	39	14	0.1	0.80	2.3	0.14
Bike ^b (ml/kg min)								
Male	35.2	144	30.3	53	10.4	0.002	20.9	0.000
Female	33.4	17	29.1	5	0.2	0.64	2.0	0.17
Absenteeism (days/year)								
Male	4.2	346	4.5	89	0.02	0.09	3.5	0.06
Female	5.2	59	7.4	19	1.8	0.18	0.4	0.55
Workers' compensation (\$/year)								
Male	68	346	23	89	1.6	0.20	1.3	0.25
Female	75	59	103	19	0.3	0.59	0.0	0.98

^aOfficers <35 years of age.

^bOfficers 35 years of age and older.

Discussion

Our study found differences in body fat and most physical fitness parameters between smokers and non-smokers. This is consistent with the literature which overwhelmingly supports this finding [5]. There were no significant differences in absenteeism or worker's compensation, which is consistent with some previous work [9, 10]. We found that male smokers were significantly older than male non-smokers. However, all other studied descriptive characteristics showed no significant differences.

A rational basis was not established for smoking policies affecting conditions of employment of police officers based upon body fat, obesity and the economic savings of lower absenteeism rates and workers' compensation claims. To some extent, a rational basis can be established for smoking policies based upon physical fitness of

these police officers. However, there are age, gender and test protocol considerations, which may complicate the justification for these policies.

Supplementary data

Please note that a longer version of this article is available as supplementary data at Occupational Medicine Online.

Conflicts of interest

None declared.

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