



Cigarette Smoking and Military Deployment: Prospective Evaluation of Smoking Among a Large Population-based US Military Cohort

**Besa Smith, MPH, PhD
for the Millennium Cohort Study Team
US Department of Defense Center for Deployment Health Research
Naval Health Research Center**

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Background



- **Smoking is a common coping mechanism among those reporting chronic and acute stress^{1,2}**
- **Stressful occupations have higher rates of tobacco use than the US general population^{3,4}**
- **Occupational stress related to military service a strong predictor for nicotine dependence and cigarette smoking^{5,6}**

Objective



To prospectively assess whether deployment affects cigarette use in US service members deployed in support of the wars in Iraq and Afghanistan

The Millennium Cohort Study



- **21-year longitudinal study launched prior to the wars in Iraq and Afghanistan to evaluate the impact of US military service on the health of military personnel**
- **Stratified random sample of all US service personnel on duty in October 2000**
- **In 2004 and 2007, newer service members of the US military were invited into the Cohort**
- **Participants are re-surveyed every 3-years through 2022**
- **Ability to link to other data to complement subjective with objective measures of exposures and health outcomes**

Study Population



- **2001 panel with baseline and follow-up (n = 55,021)**
- **Exclusions**
 - **Completed baseline after deployment or follow-up during deployment (4,837)**
 - **Missing smoking information (1,748)**
 - **Missing demographic information (58)**
- **N = 48,378**

Smoking Questions



- “Have you ever smoked at least 100 cigarettes in your lifetime?”
 - “No” —————→ **Nonsmokers**
 - “Yes”
 - ↓
- “Have you ever tried to quit smoking?”
 - “Yes, and succeeded” —————→ **Past smokers**
 - “Yes, but not successfully”
 - “No” } **Current smokers**
- “When smoking, how many packs per day did you or do you smoke?”
 - **Less than half**
 - **½ to 1 pack**
 - **1 to 2 packs**
 - **More than 2 packs**

Deployment Frequency



- **Nondeployed**
 - No deployments up to and including follow-up

- **Single deployers**
 - No more than one deployment prior to follow-up

- **Multiple deployers**
 - More than one deployment with the second beginning prior to follow-up

Additional Deployment Measures



- **Deployed less than 1 month**
- **Deployed greater than 9 months continuously**
- **Home for less than 1 month before deploying again**
- **Deployed with combat exposures**

History of Diagnosed or Treated Mental Health Disorder



- **Has your doctor or health care provider ever told you that you have any of the following**
 - **Depression**
 - **Manic depressive disorder**
 - **Posttraumatic stress disorder**
 - **Schizophrenia or psychosis**

- **Are you currently taking any medicine for anxiety, depression or stress?**

Life Stressors Score



- **Based on Holmes and Rahe Social Readjustment Scale**
- **Major life events such as**
 - **Divorce, separation**
 - **Major financial problems**
 - **Sexual harassment, sexual assault**
 - **Family member severely ill or die**
 - **Disabling illness or injury**
- **Life stressors score**
 - **Low**
 - **Moderate**
 - **High**

Baseline Characteristics



➤ Demographic

- Sex
- Birth year (pre-1960, 1960-1969, 1970-1979, \geq 1980)
- Education (\leq HS, some college/bachelors, advanced degree)
- Marital status (married, never married, other)
- Race/ethnicity (white, black, other)

➤ Occupation

- Rank (officer, enlisted)
- Service (Army, Air Force, Navy/CG, Marines)
- Service component (active duty, Reserve/Guard)
- Occupation (combat, healthcare, service and functional support, other)

Results



➤ **Baseline**

- **60% never smoked**
- **25% past smokers**
- **15% current smokers**

➤ **Past and current smokers more likely to be:**

- **Less highly educated**
- **White non-Hispanic**
- **Enlisted**
- **History of diagnosed or treated mental health disorder**
- **Moderate to major life stressors score**

➤ **Current smokers, younger and never or no longer married**

Results



Prevalence of smoking

➤ Overall study population

- 15% at baseline
- 22% at follow-up

} 47% ↑

➤ Nondeployed

- 15% at baseline
- 21% at follow-up

} 44% ↑

➤ Deployed

- 17% at baseline
- 26% at follow-up

} 56% ↑

Results



- **New smoking among nonsmokers**
 - 1.3% of nondeployed
 - 2.3% of those deployed once
 - 2.2% of those deployed multiple times

- **Smoking resumption among past smokers**
 - 28.7% of nondeployed
 - 39.4% of those deployed once
 - 40.3% of those deployed multiple times

Smoking Uptake Among Never and Past Smokers



Characteristic	Smoking initiation among never smokers		Smoking recidivism among past smokers	
	OR	95% CI	OR	95% CI
Deployment frequency				
Deployed once (<i>nondeployed</i>)	1.03	0.75, 1.44	1.23	1.06, 1.41
Deployed multiple times (<i>nondeployed</i>)	1.36	0.86, 2.15	1.55	1.24, 1.93
Extreme deployment < 1 month	0.90	0.56, 1.47	0.93	0.73, 1.17
Extreme deployment > 9 months	1.29	0.88, 1.89	1.28	1.03, 1.59
Minimal time home (< 1 month) before deploying again	0.52	0.12, 2.21	1.29	0.71, 2.34
Deployed with combat exposures	1.63	1.15, 2.32	1.27	1.07, 1.51

Conclusions



- **Smoking increased in this population; increase was greater among deployers; increase was greater among past smokers**
- **Deploying longer than 9 months, multiple times, and experiencing combat exposures increases the risk for smoking recidivism**
- **Experiencing combat exposures increases the risk for smoking initiation**
- **No change in quantity smoked associated with deployment**

Recommendations



- **Additional tobacco studies to follow addressing deployment and**
 - **Smokeless tobacco (chew, dip, snuff)**
 - **Cigar use**
 - **Pipe use**

- **Programs should focus on preventing smoking relapse during and after deployment**

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Millennium Cohort Study Team

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