

Combat Exposure and Cannabis Use: Are they associated?

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Abstract— Cannabis also known as marijuana is an illicit psychoactive substance derived from the Cannabis sativa plant. Regular cannabis use is associated with cannabis dependence syndrome. Cannabis users are also more likely to use other illicit drugs. Studies in high-income countries show that the pattern of drug initiation starts with alcohol and tobacco, followed by cannabis use, and then other illicit drugs.

The objective of this study was to assess the prevalence of cannabis use among Sri Lanka Navy (SLN) personnel and to identify any relationship with cannabis use and combat exposure.

This cross sectional study was carried out among representative samples of SLN Special Forces (Special Boat Squadron) and regular forces deployed in combat areas. Both Special Forces and regular forces were selected using simple random sampling. Personnel who had served continuously in combat areas during the one year period prior to end of combat operations were included in the study. Cannabis use was defined as smoking cannabis at least once during the past 12 months. Only personnel who had served continuously in combat areas during the one year period prior to end of combat operations were included in the study. Since there were no females in the Special Forces, females were excluded from the regular forces group. A total of 259 Special Forces and 412 regular navy personnel were recruited to the study.

The sample consisted of 259 Special Forces and 412 regular navy personnel. Prevalence of cannabis use was 5.22% (95% CI 3.53-6.9). There was no significant difference in prevalence of cannabis use among Special Forces personnel compared to regular forces. Significantly higher risk of cannabis use was associated with age 18-24 years [OR 4.42(95%CI 2.18-8.97), personnel who were never married [OR 2.02 (95% CI 0.99-4.12), and an educational level less than GCE 'O' Level [OR 4.02(95% CI 1.17-13.78). There was significant association between cannabis use and hazardous

alcohol use [OR 4.74 (95%CI 2.35-9.54)]. There was no significant association between cannabis use and combat exposure.

Prevalence of cannabis use was less than that reported among military personnel in several other countries. In the absence of data on cannabis use among the general population in Sri Lanka, it is not possible to compare the prevalence rate in a military population with the general population. Among SLN personnel cannabis use was significantly associated with hazardous alcohol use but not smoking. Exposure to combat was not associated with an increased risk of cannabis use. These findings are consistent with the observation that overall substance use is lower in the Sri Lankan Military. Another reason could be that the study was done almost immediately after the war during which the personnel had limited access to these substances.

Keywords— Cannabis, combat exposure, military

I. INTRODUCTION

Cannabis also known as marijuana is an illicit psychoactive substance derived from the Cannabis sativa plant. Regular cannabis use is associated with cannabis dependence syndrome. Cannabis users are also more likely to use other illicit drugs. Studies in high-income countries show that the pattern of drug initiation starts with alcohol and tobacco, followed by cannabis use, and then other illicit drugs [1].

Cannabis use impairs cognitive and behavioural functions, especially for sustained-attention tasks [2, 3]. Cannabis use increases the risk of mental disorders particularly psychoses [4-6].

Worldwide in 2009 the number of cannabis users was estimated at 125–203 million people (2.8–4.5% of the global population aged 15–64 years) [2, 7]. In South Asia, 2009 it was estimated that 16,830,000–28,110,000 (1.9%-3.1%) people aged 15–64 years used cannabis at least once in the past year [2].

The UN Office on Drugs and Crime estimates that there 600,000 cannabis users in Sri Lanka [8]. A total of 114,390 kg of cannabis was seized by police in Sri Lanka in 2010[9]. Despite indirect evidence of substantial cannabis use in Sri Lanka, there are no epidemiological studies estimating the prevalence of cannabis use. Two studies which report on cannabis use in Sri Lanka have been carried out on selected populations. A retrospective cohort study of psychiatric patients in the Ratnapura district reports a lifetime cannabis use of 2.83% [10]. Among men imprisoned for drug and drug related offences 78.8% reported cannabis use within the past 12 months [11].

Prevalence of cannabis use among military populations varies. In the French army 18.5% reported using cannabis at least once in the past 12 months and 8.1% reported regular use (smoking at least 10 joints per month) [12]. Among Canadian Forces 14% reported cannabis use[13]. Among military police in Brazil lifetime use of cannabis was 8.1%[14]. Khat is the commonest drug used by Somali combatants followed by cannabis (10.7%) [15].

In this paper we describe prevalence of cannabis use and its associations among Sri Lanka Navy personnel. The data on cannabis use in the Sri Lanka Navy was obtained as a part of a study investigating the mental health state of Navy personnel deployed in combat areas.

II. METHODS

The study methods are described in detail in a previous publication [16]. The data was collected as part of a study comparing the mental health status of Special Forces personnel with regular forces of the Sri Lanka Navy (SLN). Data collection commenced three months after combat operations ended in 2009.

This cross sectional study was carried out among representative samples of SLN Special Forces and regular forces deployed in combat areas. Both Special Forces and regular forces were selected using simple random sampling. The sample of SLN Special Forces was selected from the Special Boat Squadron. The sampling frames used were the lists of personnel from the navy central data base. Samples were selected using computer generated random numbers.

Only personnel who had served continuously in combat areas during the one year period prior to end of combat operations were included in the study. Since there were no females in the Special Forces, females were excluded from the regular forces group. A total of 259 Special Forces and 412 regular navy personnel were recruited to the study.

III. OUTCOME MEASURES

The 28 page questionnaire used in the study "Health of UK military personnel deployed to the 2003 Iraq war" was used as the data collection instrument [17]. Permission was obtained from the authors for the use of the questionnaire. The questionnaire assessed several mental health outcomes as well as alcohol use, smoking and cannabis use. Alcohol use was assessed using the AUDIT scale. Cannabis use was defined as use of cannabis within the past 12 months.

IV. ETHICAL APPROVAL

Ethical clearance was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Colombo. Participation was voluntary and written informed consent was obtained from all participants. The questionnaire did not identify the participants by name.

V. STATISTICAL ANALYSIS

Prevalence of cannabis use was calculated according to demographic variables. Association between smoking and combat exposure was explored using multiple logistic regression analyses which adjusted for demographic variables and service type. Statistical analysis was carried out using SPSS version 13.0 for Windows.

VI. STUDY SAMPLE

The sample consisted of 259 Special Forces and 412 regular navy personnel [16]. The mean age of the sample was 27.6 years (SD 5.02). Of the sample 49.0% were single, 49.6% were married and 0.3% were previously married. One third of the sample (35.2%) were engaged in combat duty, 29.1% served on board naval vessels and 35.3% were engaged in noncombat duties which included medical, logistic, engineering, communication and administrative roles.

VII. PREVALENCE OF CANNABIS USE

Cannabis use according to demographic characteristics is shown in Table 1 below. Overall prevalence of cannabis use was 5.22% (95% CI 3.53-6.9). There was no significant difference prevalence of cannabis use among Special Forces personnel compared to regular forces. (OR 0.94 (95% CI 0.46-1.89). Personnel aged 18-24 years had a significantly higher risk of cannabis use compared to those aged ≥ 25 years [OR 4.42(95%CI 2.18-8.97). Personnel who were never married were more likely to be cannabis users [OR 2.02 (95%CI 0.99-4.12). Those with an educational level less than GCE O' Level were more likely to use cannabis than personnel with educational level of GCE A' Level or higher [OR 4.02(95% CI 1.17-13.78).

Table 1. Cannabis use according to demographic characteristic

	Cannabis use prevalence (95% CI)	Unadjusted OR (95% CI)
Service type*		
Special Forces	5.02 (2.34-7.70)	0.94 (0.46-1.89)
Regular Forces	5.34 (3.16-7.52)	1.0
Age (years)		
18-24 years	11.1 (6.7-15.53)	4.42(2.18-8.97)
≥ 25	2.75 (1.27-4.23)	1.0
Marital Status		
Never married	6.91 (4.17-9.64)	2.02 (0.99-4.12)
Married/divorced	3.55 (1.57-5.53)	1.0
Educational Status		
Less than GCE 'O' Level	8.2 (4.73-11.66)	4.02(1.17-13.78)
GCE O Level	4.15 (1.84-6.47)	1.95(0.54-7.02)
GCE A Level or higher	2.17 (0.29-4.64)	1.0

VIII. CANNABIS AND OTHER SUBSTANCE USE

There was significant association between cannabis use and hazardous alcohol use [OR 4.74 (95%CI 2.35-9.54)]. A total score of ≥ 8 in the AUDIT scale denotes hazardous alcohol consumption. Current smoking was not significantly associated with cannabis use [OR 1.64 (95%CI 0.75-3.59).

IX. CANNABIS USE AND COMBAT EXPOSURE

Association between ten items of combat exposure and cannabis use were first assessed using

univariate logistic regression analysis. Risk of cannabis use was less in those exposed to many of the combat experiences as shown in Table 2 below. However a statistically significant difference was seen for seeing dead or wounded, exposure to mortar, missile, artillery fire and experiencing hostility from civilians. Since there were significant differences in cannabis use according to age, marital status and educational status we then adjusted for these variables. After adjusting the significant association between exposure to mortar, missile, artillery fire and cannabis use disappeared. The effect size for some of the other associations also reduced. Association between seeing dead or wounded, experienced hostility from civilians and cannabis use remained significant.

There was no significant association between the number of risk events and cannabis use [adjusted OR 0.90 (95% CI 0.77-1.04)].

Table 2: Association between combat experience and cannabis use

Combat exposure	Unadjusted OR
Discharged weapon in direct combat	1.20(0.61-2.38)
Thought might be killed	1.28(0.65-2.53)
Seeing dead or wounded	0.35(0.18-0.70)
Handled bodies	0.49(0.23-1.04)
Aided wounded	0.57(0.27-1.24)
Came under small arm fire	0.73(0.35-1.51)
Came under mortar, missile, artillery fire	0.38(0.16-0.94)
Experienced landmine strikes	- -
Experienced hostility from civilians	0.28(0.07-0.94)
Involved in combat with enemy vessels	0.67(0.33-1.33)

X. ASSOCIATION WITH MENTAL HEALTH OUTCOMES

Cannabis use was significantly associated with GHQ caseness [adjusted OR 2.5 (95% CI 1.05-6.01)]. This association remained even after adjusting for demographic variables. However the significant association disappeared after adjustment for hazardous alcohol use indicating that hazardous alcohol use acted as a confounding variable [adjusted OR 1.92 (95% CI 0.76-4.88)]. It was also significantly associated with PTSD caseness [adjusted OR 2.5 (95% CI 1.05-6.01)]. The association between PTSD and cannabis

disappeared after adjusting for demographic variables and hazardous alcohol use.

XI. DISCUSSION

This study provides information about cannabis use in a large community based sample in Sri Lanka. It also explores the association between cannabis use and combat exposure. The prevalence of cannabis use was 5.22% (95% CI 3.53-6.9) among SLN personnel. Younger age (18-24 years), personnel who were never married and those with an educational level less than GCE O'Level were more likely to use cannabis. Cannabis use was significantly associated with hazardous alcohol use but not smoking. Exposure to combat was not associated with an increased risk of cannabis use.

In the absence of data on cannabis use among the general population, it is not possible to compare the prevalence rate in a military population with other populations. Since this sample consisted only of males and a high proportion was young and unmarried which are factors associated with illicit drug use, we can expect the overall prevalence in this group to be higher than in a general population sample. The prevalence in this sample was higher than among a cohort of mentally ill patients in Sri Lanka [10]. However that study may have underestimated use as it relied on patient records for identification of cannabis use.

Overall rates of substance use among SLN personnel is less than those reported among military personnel in other countries. Prevalence of hazardous alcohol use and smoking are also less than that reported in US and UK military personnel. Prevalence of cannabis use too is less than that reported among French, Canadian, Brazilian and Somalian military personnel [12-15].

In military populations combat induced PTSD is associated with substance abuse but combat stress alone is not associated with substance abuse [18, 19]. Two explanations for higher rates of substance use among those with PTSD are that chronic substance users may be more vulnerable to developing PTSD or people with PTSD may use psychoactive substances as a means of self-medication [20]. We have previously reported that the rate of PTSD was low among SLN personnel despite high combat exposure [16]. Our sample contained a significant proportion of Special Forces

personnel with very high levels of combat exposure and regular forces deployed in combat areas. There was no significant difference in cannabis use between Special Forces and regular forces. We also did not find that combat exposure increased the risk of cannabis use. In fact some types of combat exposure-seeing dead or wounded or experiencing hostility from civilians was associated with a significantly lower risk of cannabis use. Therefore our study confirms the findings that increased risk of substance use is not linked to combat exposure per se.

According to the gateway theory, tobacco or alcohol use leads to cannabis use, and cannabis users more likely to go on to use heroin and cocaine [1]. With decreasing rates of smoking the relationship between cannabis use and smoking may be changing [4]. We did not find a significant association between cannabis use and smoking. However there was significant association between hazardous alcohol use and cannabis use in our sample which may indicate a subgroup who use cannabis and also indulge in harmful use of alcohol.

The General Health Questionnaire is a scale used to identify psychological morbidity in non-psychiatric settings. Our study found that cannabis users were more likely to be identified as cases based on the GHQ score. This association disappeared when we adjusted for hazardous alcohol use suggesting that hazardous alcohol use acts as a confounding factor in the aetiology of psychological morbidity.

The main limitation in our study was that self-reports were used to identify cannabis use. Under reporting is known to occur with self-reports on substance use. Under reporting of cannabis use among our sample is a distinct possibility because cannabis is an illicit drug. Despite this limitation, this study provides data on cannabis use in Sri Lanka and also supports previous findings that there is no significant association between cannabis use and combat exposure.

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