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## ALCOHOL ABUSE AMONG U.S. NAVY RECRUITS WHO WERE MALTREATED IN CHILDHOOD

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**Abstract — Aims:** To examine relationships between childhood maltreatment and alcohol-related problems among U.S. Navy recruits. **Methods:** An anonymous sample of 5697 Navy recruits completed a survey regarding their alcohol consumption, alcohol problems (binge drinking, drinking until drunk, alcohol dependence, alcohol-related arrests), and experiences of childhood physical and sexual abuse. **Results:** Most of the recruits used alcohol, and a substantial proportion reported histories of childhood maltreatment. Recruits who had been victimized as children were more likely to use alcohol. Furthermore, among drinkers, those who had been abused were more likely to exhibit alcohol problems than were non-abused drinkers. **Conclusion:** Substantial numbers of personnel with alcohol-related problems may be using alcohol to self-medicate due to a history of childhood abuse. Attention to the association between alcohol abuse and childhood maltreatment might help improve the efficacy of military alcohol reduction programs.

### INTRODUCTION

Alcohol abuse is a persistent problem in the U.S. military, especially among younger personnel. Neither 'zero tolerance' policies for alcohol abuse nor alcohol deglamorization campaigns have had a marked effect on the prevalence of heavy alcohol use, which has fluctuated around 20% for the entire Department of Defense (DoD) over the past two decades (Bray *et al.*, 2003). Both excessive drinking and alcohol-related problems are most prevalent in the lowest pay grades (E1–E3). In 2002, nearly 23% of these junior enlisted personnel reported symptoms of alcohol dependence, 27% indicated that their productivity had suffered because of their drinking, and over 20% had experienced at least one serious alcohol-related consequence, including poor performance rating, promotion failure, absence from duty, traffic accident, fighting while intoxicated, or being arrested for an alcohol-related reason, such as driving under the influence or assault (Bray *et al.*, 2003).

A substantial body of research supports a link between childhood victimization and the development of problem drinking (Stewart, 1996; Dube *et al.*, 2002). Clark *et al.* (1997) found that adolescents being treated for alcohol use disorders were 6 to 12 times more likely to have been physically abused as children, and 18 to 21 times more likely to have been sexually abused, compared with control subjects from the larger community. Other investigators found that both physical and sexual abuse contributed to the development of alcohol abuse in a group of juvenile detainees (Dembo *et al.*, 1992). Using a prospective design, Swanston *et al.* (2003) compared children who had been sexually abused with a nonabused comparison group 9 years after the former subjects' presentation for abuse at a children's hospital. Those who had been sexually abused were more likely to have a history of binge drinking, as well as a number of other behavioural and psychological problems.

Hernandez (1992) also found that adolescents who had been sexually abused were more likely to abuse alcohol, and Ireland and Widom (1994) found that childhood victimization was a significant predictor of alcohol-related arrests as an adult.

When results are examined by gender, research findings are more complicated. The 1995 Minnesota Student Survey of more than 122 000 public school students found that childhood abuse increased the likelihood of alcohol use among both males and females (Harrison *et al.*, 1997). However, while Widom *et al.* (1995) found a significant relationship between substantiated cases of childhood abuse (sexual or physical) and subsequent alcohol abuse in adult women, they did not find the same relationship in men. Researchers focusing on gender-specific alcohol outcomes for sexually abused adolescents of both genders found that women drank more frequently, relative to their controls, whereas men exhibited more extreme use of alcohol, such as binge drinking and drinking before or during school (Chandy *et al.*, 1996). After reviewing the literature on childhood abuse and alcoholism, Langeland and Hartgers (1998) concluded that '[c]urrent evidence is insufficient to draw conclusions about relationships between child sexual or physical abuse and alcoholism among men. Among females, however, there is higher likelihood of alcohol problems if they were sexually or physically abused as children.'

The present inquiry was part of a more comprehensive longitudinal investigation of an array of issues related to childhood histories of interpersonal violence in new military trainees. Half of the participants completed the study anonymously; the other half was identified by social security number. The present report, which examines the relationships between self-reported childhood victimization and current alcohol problems, is based on cross-sectional data from the anonymous portion of the sample. We hypothesized that, among drinkers, those who had been maltreated as children would have more indicators of alcohol abuse, and that the effects would be more pronounced in women.

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## METHODS

*Participants*

Participants were 5697 U.S. Navy recruits in their first week of basic training. This represented a response rate of 98.2% of all available incoming recruits in the gender-integrated units that had been invited to participate in the anonymous survey. The sample was fairly evenly divided between men (53.4%) and women (46.6%). The mean age was 19.9 years. Approximately 4% had not graduated from high school, 73.2% had completed high school but no higher training, and 22.7% had 13 or more years of formal education. Most of the recruits (87.7%) had never been married; 9.6% had children. The racial distribution was 62.2% white, 18.1% black, 11.1% Hispanic, 4.5% Asian, 1.9% American Indian, and 2.2% other. More than half of the sample (52.5%) had a parent who had served in the military.

*Measures*

The survey consisted of several scales, instruments, and items developed for the study. Variables central to the present analyses included Childhood Physical Abuse (CPA), Childhood Sexual Abuse (CSA), excessive alcohol use (binge drinking, drinking to the point of inebriation), and alcohol-related problems (dependence symptoms, arrests).

*Childhood Physical Abuse (CPA).* The parent-to-child version of the Conflict Tactics Scales (Straus, 1990) was used to assess whether participants had experienced very severe physical aggression from a parent or other close adult before the age of 18. Items asked if the respondent had ever been hit with a fist, kicked, bitten, beat up, choked, burned, or threatened/injured with a knife or gun by his or her parent, stepparent, or other adult who lived in the home. In addition, the Childhood History Questionnaire (Milner *et al.*, 1990) asked the respondent whether he or she had ever received bruises, welts, dislocations, burns, or bone fractures from a parent or other adult. Finally, a single self-report item, 'Before the age of 18, were you ever physically abused?' was included. A respondent was coded positive for CPA if he or she responded in the affirmative on any of these three measures. Cross-tabulation revealed that concordance among the measures (that is, 'yes' on all three or 'no' on all three) was 59%.

*Childhood Sexual Abuse (CSA).* The Childhood Sexual Experiences Checklist (CSEC) was developed at the Naval Health Research Center to measure history of childhood sexual abuse (Merrill *et al.*, 1997a). It asks about experiences that respondents might have had prior to their 18th birthday involving sexual touching or penetration that occurred with either a family member or a non-family member who was at least 5 years older than the respondent. For each of several types of sexual contact, the CSEC asks whether the experience had occurred (Yes/No), then presents a list of possible perpetrators (e.g. father, aunt, male cousin) and asks the respondent to identify the perpetrator, the number of times the experience occurred, and the age of both the respondent and the perpetrator when the experience first happened. In addition, there was a single global item, 'Before the age of 18, were you ever sexually abused?' Recruits were identified as

having experienced CSA if they answered 'Yes' to the single item, answered 'Yes' to any of the CSEC main items ('Did this experience happen to you?'), or identified any perpetrator who was more than 5 years older than they were. Concordance between the CSEC and the single item was 77%.

*Alcohol use and alcohol-related problems.* Two items identified participants who used alcohol: (1) 'Have you EVER consumed ANY amount of alcoholic beverages?' (Yes/No), and (2) 'When was the last time you had a drink of alcohol?' (responses ranged from 'Never' to 'Within the past week'). Those who failed to answer both questions or who responded inconsistently were excluded from further analyses. A recruit who had consumed any amount of alcoholic beverage in his or her lifetime was classified as a drinker; respondents who had never consumed any amount of alcohol were classified as non-drinkers. The remaining alcohol measures were computed for drinkers only. We used the Wechsler binge drinking item (Wechsler *et al.*, 1994) as one measure of excessive consumption. The item defines binge drinking as having more than five drinks in a row (i.e. on the same drinking occasion) for men, or more than four drinks in a row for women. Respondents were asked how many times binge drinking had occurred within the 2 weeks prior to entering basic training. As a further measure of excessive use, we asked participants whether they typically felt 'a buzz' (but not drunk), 'drunk' (but generally in control), or 'wasted' when they drank alcohol.

The Michigan Alcoholism Screening Test (MAST) was used to screen for alcohol-related problems among drinkers. The MAST has shown good internal consistency reliability, with Cronbach's alpha coefficients of 0.83 to 0.93 (Gibbs, 1983). The scale's 24 items, which measure alcohol use, symptoms of dependence, and history of alcohol problems, produce a weighted sum score that is an indicator of alcohol dependence. A total of five points or more on the scale classifies the respondent as alcoholic; four points is possibly alcoholic; and three points or less is considered not alcoholic (Seltzer, 1971). Two of the MAST items ask whether the respondent has ever been arrested because of drunken behaviour or for driving while under the influence of alcohol. Participants answering 'yes' to either item were coded as having experienced an alcohol-related arrest.

Lastly, we computed a global outcome variable for 'alcohol abuse.' Participants who reported any binge drinking, drinking until drunk, alcohol-related arrest, or a MAST score greater than three were assigned a score of one on alcohol abuse; those responding negatively on all four measures received a score of zero.

*Procedure*

The research protocol was approved by the Institutional Review Boards at the performing institutions. Study participation was solicited in a classroom setting during recruit orientation. A civilian researcher read a description of the study and requested volunteers, emphasizing that the survey was completely anonymous and that there would be no penalty for anyone who declined to participate, skipped items, or chose not to complete the questionnaire. Those who agreed to take part in the study were provided with a written informed

Table 1. Prevalence of alcohol use/misuse by respondent gender and experience of childhood physical or sexual abuse

Alcohol measure	CPA					
	Men			Women		
	Yes	No	OR (95% CI)	Yes	No	OR (95% CI)
Ever drank	86.9	83.1	1.35** (1.09–1.67)	88.5	81.0	1.80*** (1.43–2.25)
Current drinker	73.7	70.7	1.16 (0.96–1.42)	67.3	64.0	1.16 (0.95–1.40)
Binge drinking	64.0	59.1	1.23* (1.04–1.46)	51.2	48.0	1.14 (0.96–1.36)
Drink until drunk	57.4	49.6	1.37*** (1.15–1.63)	46.3	39.8	1.30** (1.08–1.57)
Alcohol arrest	13.1	9.8	1.39** (1.08–1.79)	4.8	3.7	1.32 (0.85–2.03)
Alcoholic (MAST)	49.4	35.8	1.75*** (1.47–2.08)	35.0	22.0	1.91*** (1.55–2.35)
Alcohol abuser	80.6	74.5	1.42*** (1.16–1.72)	69.6	64.4	1.26* (1.05–1.52)

  

Alcohol measure	CSA					
	Men			Women		
	Yes	No	OR (95% CI)	Yes	No	OR (95% CI)
Ever drank	89.0	83.6	1.59*** (1.21–2.09)	90.7	79.4	2.53*** (1.99–3.21)
Current drinker	77.9	70.3	1.49*** (1.17–1.90)	67.4	64.1	1.16 (0.96–1.41)
Binge drinking	72.0	58.2	1.85*** (1.50–2.28)	53.4	45.8	1.36*** (1.14–1.62)
Drink until drunk	56.5	52.1	1.19 (0.97–1.46)	47.2	39.2	1.39*** (1.15–1.67)
Alcohol arrest	16.0	9.9	1.72*** (1.31–2.27)	4.8	3.8	1.26 (0.82–1.93)
Alcoholic (MAST)	55.9	38.0	2.07*** (1.69–2.54)	33.4	24.4	1.56*** (1.27–1.91)
Alcohol abuser	84.3	75.1	1.78*** (1.38–2.29)	71.3	62.8	1.47*** (1.22–1.77)

CPA, childhood physical abuse; CSA, childhood sexual abuse; OR, odds ratio; CI, confidence interval; MAST, Michigan Alcoholism Screening Test; Alcohol abuser, 'yes' on at least one of these measures: binge, drunk, arrest, alcoholic; Men,  $N = 3036$ ; Women,  $N = 2636$ ;

\*  $P < 0.02$ ;

\*\*  $P < 0.01$ ;

\*\*\*  $P < 0.001$ .

consent document describing the purpose of the study and the procedures used to ensure confidentiality. When participants finished, they sealed their survey in a pre-addressed envelope that was mailed directly to civilian collaborators at a state university for processing.

## RESULTS

### Alcohol use

Nearly 85% of the respondents reported drinking at least some amount of alcohol during their lives. More than two thirds of all drinkers (69.1%) had used alcohol within the preceding 30 days. Alcohol problems among drinkers were common. Almost half (48.5%) said that they usually drank until they were drunk, and they reported an average of 3.0 binge episodes during the previous 2 weeks ( $SD = 4.4$ ). Approximately 8% had been arrested for an alcohol-related offense. The mean MAST score of 4.4 ( $SD = 5.7$ ) reflected possible alcohol dependence. Using Seltzer's (1971) suggested MAST cut points, 33.0% of drinkers were classified as alcoholic and an additional 8.2% were classified as possibly alcoholic.

There was no significant difference in the prevalence of alcohol use ('ever drank') between men (84.7%) and women (84.9%). However, among drinkers, men (72.1%) were more likely than women (65.8%) to be current users,  $X^2(1) = 18.0$ ,  $P < 0.001$ . Men were also more likely to report alcohol problems. (*Note:* These and all remaining analyses of drinking problems have been conducted on drinkers only.) About two thirds (61.4%) of male drinkers were binge drinkers

(vs 49.7% of females),  $X^2(1) = 59.9$ ,  $P < 0.001$ ; 53.2% would typically drink until drunk (vs 43.3% of women),  $X^2(1) = 38.0$ ,  $P < 0.001$ ; 11.4% had been arrested for an alcohol-related offense (vs 4.3% of women),  $X^2(1) = 73.3$ ,  $P < 0.001$ ; and 47.0% were classified as alcoholic or possibly alcoholic (vs 34.7% of women),  $X^2(2) = 73.0$ ,  $P < 0.001$ . Overall, more than three fourths of male drinkers (77.3%) and over two thirds of female drinkers (67.2%) abused alcohol,  $X^2(1) = 56.8$ ,  $P < 0.001$ .

### History of abuse and alcohol problems

Over 47% of the total sample had been physically abused as children, women being at a higher risk than men for CPA ( $W = 51.7\%$ ,  $M = 43.7\%$ , odds ratio [OR] = 1.38, 95% Confidence Interval (CI) = 1.24–1.53,  $P < 0.001$ ). Nearly 35% of the sample had experienced sexual maltreatment before the age of 18. The risk (odds ratio) for CSA was more than three times higher for women than for men ( $W = 48.5\%$ ,  $M = 22.5\%$ , OR = 3.24, 95% CI = 2.89–3.63,  $P < 0.001$ ). Table 1 presents prevalence rates for the alcohol measures by gender and type of abuse. The percentage of ever-drinkers was significantly higher among participants who had been maltreated as children, though current drinking among alcohol users (past 30-day use) was not related to abuse history except in the case of CSA in men, where sexually abused men were significantly more likely than non-abused men to be current drinkers (OR = 1.49).

Regarding alcohol problems among drinkers (Table 1), the prevalence of binge drinking was higher among men

Table 2. Results from MANOVA and ANOVAs on alcohol abuse measures (drinkers only)

Effect	Multivariate <i>F</i> ( <i>df</i> = 3, 3875)	Univariate <i>F</i> ( <i>df</i> = 1, 3877), Alcohol abuse variables		
		MAST	Binge episodes	Drink until drunk
CPA	17.77***	51.31***	6.12*	15.14***
CSA	20.43***	39.37***	44.80***	7.65**
GENDER	34.37***	96.70***	28.73***	33.08***
CPA × GENDER	2.64*	2.91	1.83	0.08
CSA × GENDER	6.00***	7.01**	8.43**	0.86
CPA × CSA	1.84	1.35	0.47	1.67
CPA × CSA × GENDER	1.18	0.25	1.98	0.45

CPA, childhood physical abuse; CSA, childhood sexual abuse; *df*, degrees of freedom;

\*  $P < 0.05$ ;

\*\*  $P < 0.01$ ;

\*\*\*  $P < 0.001$ .

who had been either physically or sexually maltreated than among those who had not. The effect of CSA on binge drinking was significantly stronger than the effect of CPA, as indicated by their non-overlapping CIs. Among women, CSA was significantly associated with increased likelihood of binge drinking, whereas CPA was not. Both physical and sexual abuse were predictive of drinking until drunk among female recruits, but only physical maltreatment was associated with the prevalence of such behaviour in males. Although men who had experienced either CPA or CSA were at significantly higher risk for an alcohol-related arrest, there was no significant relationship between maltreatment and alcohol arrest among women. We explored the relationship between childhood abuse and the MAST cut point categories of 'alcoholic' and 'not alcoholic,' dropping the equivocal middle category of 'possibly alcoholic' (about 8% of the sample). Among both men and women, there was a strong, consistent relationship between having experienced CPA or CSA and being classified as alcoholic. Similarly, the risk estimates for alcohol abuse were consistently higher among recruits who had experienced childhood abuse.

To simultaneously examine the effects of CPA, CSA, and recruit gender on alcohol problems, we conducted a Multivariate Analysis of Variance (MANOVA) for mean MAST scale score, average number of binge drinking episodes, and average degree of inebriation experienced when drinking. Results from the MANOVA are summarized in Table 2. All main effects were significant, both in the MANOVA and in follow-up univariate ANOVAs on each of the three outcome measures. Consistent with the results of previous analyses, the severity of alcohol-related problems was higher for men than for women (see final column of Table 3) and for victims of CPA or CSA than for non-victims (see 'Total' rows in Table 3).

In addition, the MANOVA yielded evidence of two significant interactions: CSA × GENDER and CPA × GENDER. Follow-up univariate ANOVAs for the CSA × GENDER interaction revealed significant interaction effects for mean MAST score and number of binge drinking episodes. Inspection of the univariate means (Table 3) revealed that a history of sexual maltreatment had a larger effect on men than on women in terms of both alcoholism and binge drinking. Although the second interaction, CPA × GENDER, was statistically significant in the overall MANOVA, none of the

Table 3. Mean scores on alcohol measures (drinkers only) by gender and type of abuse

Alcohol measure	Group	CPA		CSA		Total
		Yes	No	Yes	No	
MAST score	Men	6.01	4.18	6.63	4.52	5.01
	Women	4.24	2.99	4.13	3.16	3.67
	Total	5.10	3.68	4.97	4.04	4.38
Binge drinking episodes	Men	3.45	2.90	4.32	2.80	3.15
	Women	3.14	2.41	3.16	2.43	2.81
	Total	3.29	2.69	3.55	2.67	2.99
Level of drunkenness	Men	1.68	1.57	1.67	1.61	1.62
	Women	1.57	1.45	1.57	1.46	1.51
	Total	1.62	1.52	1.60	1.56	1.57

CPA, childhood physical abuse; CSA, childhood sexual abuse; MAST, Michigan Alcoholism Screening Test; Men,  $N = 2066$ ; Women,  $N = 1819$ .

follow-up univariate ANOVAs revealed significant CPA × GENDER interactions. The remaining interaction terms in the MANOVA (CPA × CSA, and CPA × CSA × GENDER) were non-significant, indicating that the effects of CPA and CSA were independent.

## DISCUSSION

Despite DoD policy changes and health promotion campaigns, heavy drinking remains a problem for the U.S. military, particularly among younger personnel. While many factors, such as peer pressure, media images, availability of alcohol, and parental alcohol use potentially influence adolescent drinking, Daugherty and Leukefeld (1998) suggested that early alcohol use might be a risk indicator for underlying issues that lead to both early drinking and later problems with alcohol. To explore the possibility that a history of childhood abuse might be associated with alcohol misuse in this population, we administered an anonymous survey to U.S. Navy recruits regarding their alcohol consumption and experiences of childhood maltreatment. Our findings show a significant relationship between a history of victimization as a child and current alcohol problems.

The majority of recruits in this study were drinkers, and a substantial proportion had experienced either physical or sexual abuse (or both) prior to the age of 18. Previous studies also have reported high rates of childhood victimization among military recruits (Rosen and Martin, 1996; Merrill *et al.*, 1997b). Consistent with earlier research (Harrison *et al.*, 1997), we found that a history of maltreatment was associated with increased alcohol use in both men and women. A large number of participants not only consumed alcohol, they consumed it at a rate and in a manner that constitutes alcohol abuse. As expected, men were more likely than women to have problems with alcohol. And as we hypothesized, alcohol users with a history of childhood abuse were significantly more likely than those who had not been abused to exhibit alcohol-related problems. This was true for both men and women on all measures except alcohol-related arrest, where no significant relationship was found for women.

We did not anticipate that the strength of association between childhood abuse and alcohol problems would be as strong or stronger for men than for women. In contrast to some previous studies (Widom *et al.*, 1995; Cunradi *et al.*, 2005), we found that maltreated men demonstrated risk ratios that were at least as high as those of maltreated women on most alcohol measures, and that sexual abuse was more strongly related to binge drinking and alcoholism in men than in women. Comparisons with other research should be made cautiously, however. Inconsistency in results is often attributable, at least in part, to methodological differences in the studies. Moreover, the observed associations do not prove causal relationships. Other factors that were not controlled in this study, such as parental substance abuse, could potentially account for both childhood maltreatment and current alcohol problems.

Certain study limitations should be noted. The data are retrospective and based entirely on self-report. Participant recollections and disclosures might have been influenced by a number of response biases, including social desirability or the individual's current life experiences. Although the survey was anonymous, participants might have been reluctant to answer honestly, particularly regarding their alcohol use, given the military setting in which the survey was administered. Finally, the design does not allow for attribution of causal directions. A model of alcohol use that includes histories of various traumas, measures of current stress, and the influence of peer and family substance use needs to be developed to tease out underlying dynamics and establish clear causal pathways.

The study has a number of strengths. It is the first study that we are aware of to examine the link between heavy alcohol use and childhood victimization in a young military population. Unlike many studies involving either childhood maltreatment or alcohol abuse, our sample came from a non-clinical population. The cohort was a large, ethnically diverse occupational group whose members face unique risks and stressors—conditions that are likely to interact with both personal trauma histories and alcohol consumption. Inclusion of both men and women enabled us to make important gender comparisons with regard to alcohol problems and types of maltreatment experienced. The high survey response rate, and the use of multiple measures for both childhood abuse and alcohol use, are also important strengths. The findings presented here add to the growing epidemiologic literature on

the association between childhood physical abuse, childhood sexual victimization, and the presentation of alcohol problems in men and women.

A recent increase in heavy drinking in the military (Bray *et al.*, 2003) has cast doubt on the efficacy of current DoD alcohol reduction programs. If a history of childhood victimization is associated with problematic drinking for many military trainees, then an exploration of this issue may prove to be of value to prevention and treatment programs. Moreover, ongoing combat operations are producing a surge in mental health problems among active-duty personnel (Hoge *et al.*, 2006). Interrelationships between childhood trauma, combat stress, post-traumatic stress disorder, and substance abuse are complex, and they suggest that increased functional difficulties may be expected among military personnel returning from hostile environments. These difficulties might lead to self-medication with alcohol, but such alcohol misuse is not likely to be successfully resolved with simple educational interventions. Given the prevalence of drinking among incoming recruits, they should continue to receive educational training in alcohol moderation. In addition, individuals being counseled for alcohol problems might also be evaluated for a history of childhood victimization (Dembo *et al.*, 1992; Rosen and Martin, 1996; Clark *et al.*, 1997) so that the most appropriate treatment can be provided.

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# REPORT DOCUMENTATION PAGE

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**13. SUPPLEMENTARY NOTES**

**14. ABSTRACT (maximum 200 words)**

**Aim:** To examine relationships between childhood maltreatment and alcohol-related problems among U.S. Navy recruits. **Methods:** An anonymous sample of 5697 Navy recruits completed a survey regarding their alcohol consumption, alcohol problems (binge drinking, drinking until drunk, alcohol dependence, alcohol-related arrests), and experiences of childhood physical and sexual abuse. **Results:** Most of the recruits used alcohol, and a substantial proportion reported histories of childhood maltreatment. Recruits who had been victimized as children were more likely to use alcohol. Furthermore, among drinkers, those who had been abused were more likely to exhibit alcohol problems than were nonabused drinkers. **Conclusion:** Personnel presenting with alcohol-related problems should be evaluated for a history of childhood abuse. Attention to the association between alcohol abuse and childhood maltreatment might help improve the efficacy of Department of Defense alcohol reduction programs.

**15. SUBJECT TERMS**  
alcohol abuse, childhood abuse, military recruits, U.S. Navy

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