Suicide and Life-Threatening BEHAVIOR
THE OFFICIAL JOURNAL OF THE AMERICAN ASSOCIATION OF SUICIDOLOGY

Suicide and Life-Threatening Behavior 48 (2) April 2018

DOI: 10.1111/sltb.12363

Lifetime Suicidal Behaviors and Career Characteristics Among U.S. Army Soldiers: Results from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS)

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The current report presents data on lifetime prevalence of suicide ideation and nonfatal attempts as reported by the large representative sample of U.S. Army soldiers who participated in the Consolidated All-Army Survey of the Army Study to Assess Risk and Resilience in Servicemembers (N = 29,982). We also examine associations of key Army career characteristics with these outcomes. Prevalence estimates for lifetime suicide ideation are 12.7% among men and 20.1% among women, and for lifetime suicide attempts are 2.5% and 5.1%, respectively. Retrospective age-of-onset reports suggest that 53.4%–70% of these outcomes had preenlistment onsets. Results revealed that, for both men and women, being in the Regular Army, compared with being in the National Guard or Army Reserve, and being in an enlisted rank, compared with being an officer, is associated with increased risk of suicidal behaviors and that this elevated risk is present both before and after joining the Army.

The suicide rate in the U.S. Army has historically been below the civilian rate (Bachynski et al., 2012), but it has increased dramatically in the years following the start of the wars in Iraq and Afghanistan (Kuehn, 2009; Nock et al., 2013). As a result of this increase, among several suicide prevention efforts, the Army initiated the Army Study

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to Assess Risk and Resilience in Servicemembers (Army STARRS; http://starrs-ls.org), a large-scale epidemiological study, to better understand the correlates and causes of suicide among soldiers (Ursano et al., 2014).

One goal of Army STARRS is to identify factors associated with heightened suicide risk and determine when this risk first occurred to generate hypotheses about why soldiers are at risk and the optimal time to intervene with help. Prior Army STARRS reports have focused on describing the prevalence of nonlethal suicidal behaviors to examine a wider scope of risk than suicide death and determining the extent to which soldiers enter the Army already at heightened risk for suicidal behaviors versus increased risk that occurs only following Army enlistment. Understanding pre- versus postenlistment risk is important because it can help address whether soldiers enter the Army with preexisting suicidal behaviors or onset of these behaviors only occurs following Army-related experiences (e.g., combat). Furthermore, measures the Army could take to reduce suicidal risk would depend greatly on when certain factors increase risk. For example, substantial preenlistment risk could lead to changes in recruitment screening procedures, whereas substantial postenlistment risk might require efforts to psychologically prepare soldiers for experiences that elevate risk.

Army STARRS has started to provide a first glimpse into pre- versus postenlistment suicidal risk across several different classes of factors, such as demographic differences and mental disorders. In a prior Army STARRS report, Nock and colleagues (2014) used data from early replicates of the STARRS All-Army Survey (AAS), a large, representative survey of active duty Regular Army soldiers, to estimate prevalence and basic correlates of self-reported nonlethal suicidal behaviors. Lifetime prevalence estimates of suicide ideation, plans, and attempts were 13.9%, 5.3%, and 2.4%, respectively. Retrospective age-of-onset reports estimated that half of the soldiers with lifetime ideation and plans began thinking and planning suicides prior to enlistment, that 47% of the soldiers who ever made nonfatal suicide attempts made their first attempts prior to age at enlistment, and that 31.3% of suicide attempts after enlistment were associated with preenlistment mental disorders (Nock et al., 2014). These results implied that increased risk of suicidal behaviors in the Army was due partly to preexisting vulnerabilities among soldiers and not exclusively to Army experiences; but they were limited by the fact that the sample on which the results were based was small ($N = 5,428$) and excluded both soldiers that were deployed and soldiers in the Army National Guard and Army Reserve (G/R). The current report presents data on the full Consolidated AAS sample ($N = 29,982$), which includes soldiers who were deployed to Afghanistan at the time of the survey as well as G/R soldiers.

In addition to other factors, Nock et al. (2014) examined whether suicide risk varied across career characteristics, such as rank. Examining the association between career characteristics and suicide risk is important because identifying careers with higher suicide risk would help the Army target groups of soldiers requiring greater monitoring and additional psychiatric services. In addition, although it is assumed that some careers are at increased risk of suicidal behaviors because of Army experiences (e.g., trauma), some careers may exhibit higher suicide risk due to soldiers entering into these careers with suicidal behaviors prior to enlistment. However, no studies have examined this question.

The first aim of this report is to provide updated prevalence estimates for pre- and postenlistment suicidal behaviors in the Army based on a larger and more broadly representative sample in the full Consolidated AAS than in the earlier Nock et al. report. The second aim is to expand the Nock et al. (2014) analysis to examine associations of three critical Army career characteristics—rank, occupation, and

component (i.e., Regular Army versus Army National Guard/Army Reserve)—with self-reported suicidal behaviors separately for the subset of these behaviors that began prior to enlistment and those that began only after enlistment. This specification goes beyond previous studies, a number of which have documented associations of these career characteristics with suicidality (Kessler et al., 2015; Nock et al., 2014; Ursano, Heeringa, et al., 2015; Ursano, Kessler, Stein, et al., 2015), by investigating the possibility that these associations are due to selection processes rather than to experiences associated with the career characteristics (e.g., higher exposure to traumatic experiences by soldiers in combat arms occupations than other occupations; Nock et al., 2014). We did this by treating these career characteristics as predictors of first onset of the outcomes both *before* and *after* age at enlistment. Based on the early ages of onset of these outcomes found by Nock et al. (2014), we would expect that soldiers who subsequently had career characteristics associated with increased risk of suicidality in the Nock et al. report might have had high risk of these same outcomes before enlistment, whereas we would expect those associations to emerge only after enlistment if military experiences accounted for the associations. We are unaware of any previous attempt to examine these important specifications.

Prior studies have found that junior rank enlisted soldiers have higher risk of suicide death and suicidal behaviors than soldiers of higher rank (Gilman et al., 2014; Nock et al., 2014; Reger et al., 2015; Ursano, Kessler, Heeringa, et al., 2015) and that soldiers in combat-related occupations (i.e., combat arms; Gadermann et al., 2014) have higher rates of suicide death than those in other occupations (Helmkamp, 1996; Kessler et al., 2015; Trofimovich, Reger, Luxton, & Oetjen-Gerdes, 2013), but it is not known whether these associations apply as well to the range of suicidal behaviors considered in this report. In addition to rank and occupation, differences in suicidal behavior may vary among Regular Army and G/R components. Suicide rates over the past decade have increased in both the Regular Army and G/R (Black, Gallaway, Bell, & Ritchie, 2011; Griffith, 2012), but few studies have examined whether suicidal behaviors differ between components. Ursano, Heeringa, and colleagues (2015) reported a higher lifetime rate of suicide ideation among activated G/R soldiers than soldiers in the Regular Army during the first week of basic combat training (BCT), but we are unaware of any studies on suicidal behaviors that have directly compared active soldiers serving in the Regular Army versus G/R.

The large sample size included in this study provides a unique opportunity to test associations between career variables and suicide ideation, plans, and attempts and whether onset of these behaviors occurred before or after joining the Army. Importantly, given that the percentage of women varies greatly across career positions and women consistently show higher rates of nonlethal suicidal behaviors (Nock et al., 2014; Ursano, Heeringa, et al., 2015; Ursano, Kessler, Stein, et al., 2015), associations between particular careers and suicidal behaviors could be inflated by the presence of a larger proportion of women. To control for this potential confound, we examined models that included interactions with gender and focused on models stratified by gender. Examining gender and career characteristics is also important because new Army policies, such as lifting the ban on women joining ground combat units in 2013, allow women to have career roles not historically available to them (Servick, 2015) with unknown consequences for suicide risk.

METHOD

Sample

Data came from self-report questionnaires (SAQs) collected in a series of three

Army STARRS surveys and merged into a data set we refer to as the *Consolidated All-Army Survey* to create a portrait of all active duty soldiers exclusive of those in BCT. The first of the three surveys was the AAS, a de-identified cross-sectional survey of active duty soldiers exclusive of those in BCT or deployed to a combat theater based on quarterly replicates in 2011–2012 and additional G/R units in 2013 of stratified (by Army Command-location) probability samples of units or subunits selected with probabilities proportional to authorized unit strength excluding units of fewer than 30 soldiers (less than 2% of Army personnel). All personnel in the selected units were ordered to attend an informed consent presentation explaining study purposes, confidentiality, and voluntary participation before requesting written informed consent for a group SAQ, to link their administrative records to questionnaire responses, and to participate in future data collections. Identifying information (e.g., name, SSN) was collected from consenting respondents and kept in a separate secure file.

A total of 17,462 AAS respondents completed the SAQ and provided consent for administrative data linkage. Although all unit members were ordered to report to informed consent sessions, 20.2% were absent due to conflicting duty assignments. The vast majority of attendees (95%) consented to the survey, 97.3% of consenters completed the survey, and 63.1% of completers provided record linkage. Most incomplete surveys were due to logistical complications (e.g., units either arriving late or having to leave the 90-minute sessions early), although some respondents needed more than the allotted time to complete the survey. The survey completion-successful-linkage *cooperation* rate was 58.3% ($0.95 \times 0.973 \times 0.631$) and the *response* rate 46.5% ($[1–0.202] \times 0.583$) based on the American Association of Public Opinion Research COOP1 and RR1 calculation methods (American Association for Public Opinion Research, 2009).

As the AAS did not include soldiers currently deployed to a combat zone, a special AAS supplemental sample was selected of soldiers deployed in Afghanistan. Unlike the main AAS, though, constraints on our ability to administer surveys in Afghanistan led us to implement the data collection in Kuwait with soldiers who were waiting to be processed for transit to and from their mid-deployment leave. In all other respects, though, the recruitment, consent, and data collection procedures were identical to those in the main AAS. A total of 3,987 respondents completed the SAQ and provided consent for administrative data linkage. A majority of soldiers (80.9%) consented to the survey, 86.5% of consenters completed the survey, and 55.6% of completers provided record linkage, for a survey completion-successful-linkage *cooperation* rate of 38.9% ($0.809 \times 0.865 \times 0.556$). The response rate could not be calculated because data were not collected on the denominator population of soldiers invited to the sessions.

Another Army STARRS survey was a prospective pre–post deployment survey (PPDS) of soldiers in three Brigade Combat Teams initially assessed shortly before deploying to Afghanistan and then again three times after returning from deployment. We merged the baseline PPDS with the AAS and Kuwait supplement to the AAS in order to enrich the consolidated sample for soon-to-deploy units that were under represented because of logistical complications in the main AAS. The recruitment, consent, and data collection procedures were identical to those in the main AAS. A total of 8,558 respondents completed the baseline PPDS SAQ and provided consent for administrative data linkage. The vast majority of soldiers recruited into the PPDS attended the consent session (96.7%), with 98.7% of the latter consenting to the survey, 99.2% of consenters completed the survey, 90.9% of completers providing record linkage, for a survey completion-successful-linkage *cooperation* rate of 89% ($0.987 \times$

0.992 × 0.909) and a *response* rate of 86.1% (0.967 × 0.89).

The recruitment, consent, and data protection procedures in the above surveys were approved by the Human Subjects Committees of the Uniformed Services University of the Health Sciences for the Henry M. Jackson Foundation (the primary grantee), the Institute for Social Research at the University of Michigan (the organization collecting the data), and all other collaborating organizations. SAQ responses of participants in the surveys who agreed to administrative data linkage were doubly weighted before combining to adjust for discrepancies between the sample and population. The first weight (W1) adjusted for differences in survey responses between the respondents who agreed to record linkage and those who did not. The second weight (W2) adjusted for differences in multivariate administrative record profiles of weighted (W1) survey completers with record linkage and the target population. The latter weight adjusted the sample to be representative of all active duty soldiers during the years 2011–2012 on the cross-classification of sociodemographics (age, sex, race ethnicity, education, marital status), command (e.g., Forces Command, Training and Doctrine Command, Reserve Command [Army Reserve, Army National Guard], Component Commands), occupation (combat arms, combat support, combat service support), rank (E1-E4, E5-E9, W1-W4, O1-O10), and deployment status history (never deployed, currently deployed [the Kuwait supplemental sample], previously deployed). The doubly weighted (W1 × W2) data were combined to create the Consolidated AAS. A more detailed description of AAS weighting is presented elsewhere (Kessler et al., 2013). Finally, participants (n = 25) with unknown survey dates were omitted from the final analytic sample.

Measures

Suicidal Behaviors. Suicidal behaviors were assessed using a modified version of the Columbia Suicidal Severity Rating Scale (C-SSRS; Posner et al., 2011) that assessed lifetime occurrence and age of onset (AOO) of suicide ideation ("*Did you ever in your life have thoughts of killing yourself*" or "*Did you ever wish you were dead or would go to sleep and never wake up?")* and, among respondents who reported lifetime ideation, suicide plans ("*Did you ever have any intention to act [on these thoughts/on that wish]?*" and, if so, "*Did you ever think about how you might kill yourself [e.g., taking pills, shooting yourself] or work out a plan of how to kill yourself?*") and attempts ("*Did you ever make a suicide attempt [i.e., purposefully hurt yourself with at least some intention to die]?*").

Sociodemographic and Army Career Variables. The sociodemographic variables we focus on here are respondent age and sex. The Army career variables considered are age at enlistment, component (Regular Army versus Reserve component [i.e., activated G/R]), military occupational specialty (MOS), and rank (junior enlisted E1-E4, senior enlisted E5-E9, and officers [combining warrant officers and commissioned officers]). Consistent with previous work on occupational differences in soldier health (Gubata, Piccirillo, Packnett, & Cowan, 2013; Lindstrom et al., 2006; Niebuhr et al., 2011), we distinguished three broad classes of occupations: *combat arms*, which are involved directly in ground combat; *combat support*, which provide operational assistance to combat arms; and all other, which are referred to collectively as *combat service support* occupations (Kirin & Winkler, 1992; Layne, Naftel, Thie, & Kawata, 2001). A more detailed discussion of MOS coding in STARRS is presented elsewhere (Kessler et al., 2015).

Analysis Methods

Retrospective age-of-onset reports were analyzed using the two-part actuarial method to estimate survival curves, a method differing from the Kaplan–Meier (Kaplan & Meier, 1958) method in using a more

accurate way of estimating onsets within a given year (Halli & Rao, 1992). Both absolute morbid risk (cumulative lifetime risk of ever having suicide ideation, developing a plan, or making an attempt) and relative morbid risk (the proportion of total morbid risk at each age) are reported for each outcome. Discrete-time survival analysis, with person-year the unit of analysis and a logistic link function (Efron, 1988), was used to examine associations of predictors with onset of suicidal behavior. Pre–postenlistment was a time-varying predictor while component, rank, and occupation were considered only at the time of survey administration. Unlike conventional survival analysis, where predictors are assessed as of a time prior to the time of the outcome assessment, we consider postenlistment career variables as "predictors" of preenlistment suicidality as a way of investigating the possible existence of predisposing factors that predict both preenlistment suicidality and postenlistment selection into components and occupations. Survival coefficients were exponentiated to create odds ratios (ORs) with 95% confidence intervals (Halli & Rao, 1992; Kaplan & Meier, 1958). As the Consolidated AAS data are both clustered and weighted, the design-based Taylor series linearization method was used to produce standard errors (Wolter, 1985). Multivariate significance was examined using design-based Wald *F* tests.

RESULTS

Lifetime Prevalence and Age of Onset of Suicidal Behaviors

Lifetime prevalence estimates of suicide ideation are 12.7% among men and 20.1% among women in the total AAS (Table 1). Lifetime prevalence estimates of suicide attempts are 2.5% among men and 5.1% among women. Female gender is associated with significantly greater odds of suicide ideation (OR = 1.7 [95% CI: 1.5–2.0]) and attempt (OR = 2.2 [1.7–3.0]). Women also have slightly higher rates (but not significantly so) of the three transition probabilities we examined between ideation and attempts—the probability that ideators go on to develop a suicide plan (41.8% among men versus 46% among women; OR = 1.0 [0.8–1.3]); the probability that ideators with a plan go on to make an attempt (33.9% among men versus 38.3% among women; OR = 1.3 [0.9–1.9]), and the probability that ideators without a plan make an attempt (14.8% among women versus 9.2% among men; OR = 1.6 [1.0–2.7]).

Male lifetime prevalence of suicide attempts is significantly higher among soldiers who at the time of survey were in the Regular Army than those who were in the G/R [2.6% versus 1.2%; $F(1,210) = 26.8$, $p < .001$] and among junior and senior enlisted soldiers than officers [2.9%–2.5% versus 1.2%; $F(2,209) = 7.8$, $p < .001$], but does not differ by MOS at the time of survey [$F(2,209) = 0.1$, $p = .88$]. The significant association with component is due to Regular Army soldiers having significantly higher prevalence than those in the G/R of ideation in the total sample [13.2% versus 8.4%; $F(1,210) = 24.8$, $p < .001$] and of attempts among planners [35.5% versus 16.1%; $F(1,210) = 15.4$, $p < .001$] despite having a significantly lower probability of plans among ideators [41.1% versus 52.3%; $F(1,210) = 5.0$, $p = .03$]. The significant association with rank is due to enlisted soldiers having significantly higher prevalence than officers of attempts both among planners [39.7%–34.1% versus 17%; $F(2,209) = 9.8$, $p < .001$] and among ideators without a plan [12.1%–7% versus 5.3%; $F(2,209) = 7.0$, $p < .001$] despite not differing in prevalence of ideation in the total sample, $F(2,209) = 0.5$, $p = .62$), or plans among ideators, $F(2,209) = 0.8$, $p = .46$). In other words, officers are as likely as enlisted soldiers to think-plan about suicide but significantly less likely to act on those thoughts-plans.

The situation is somewhat different for female soldiers, where prevalence of suicide attempts is significantly higher among

TABLE 1
Lifetime Suicidality by Selected Army Characteristics, Stratified by Sex, Weighted Analysis (N = 29,982)

	Total sample								Ideators				Ideators with plan				Ideators without plan			
	Lifetime ideation				Lifetime attempt				Lifetime plan				Lifetime attempt				Lifetime attempt			
	%	*SE*	*n* numerator	*n* denominator	%	*SE*	*n* numerator	*n* denominator	%	*SE*	*n* numerator	*n* denominator	%	*SE*	*n* numerator	*n* denominator	%	*SE*	*n* numerator	*n* denominator
Men																				
Component: Regular Army	13.2	0.4	(3,135)	(24,788)	2.6	0.2	(598)	(24,788)	41.1	1.7	(1,083)	(3,135)	35.5	2.0	(392)	(1,057)	9.0	1.0	(206)	(2,078)
Component: Guard-reserve	8.4	0.9	(209)	(2,139)	1.2	0.2	(37)	(2,139)	52.3	4.5	(111)	(209)	16.1	3.0	(24)	(111)	11.6	3.4	(13)	(98)
F(1, 210), *p* value			24.8*, <.001				26.8*, <.001				5.0*, .026				15.4*, <.001				0.6, .46	
MOS: Combat arms	12.4	0.4	(1,622)	(13,371)	2.5	0.2	(311)	(13,371)	38.1	2.4	(533)	(1,622)	40.1	2.9	(201)	(522)	8.8	1.1	(110)	(1,100)
MOS: Combat support	12.7	0.8	(746)	(5,877)	2.4	0.4	(145)	(5,877)	46.5	3.1	(291)	(746)	29.0	5.0	(93)	(282)	10.4	1.8	(52)	(464)
MOS: Combat service support	13.3	0.7	(976)	(7,679)	2.4	0.3	(179)	(7,679)	43.2	2.3	(370)	(976)	30.8	3.4	(122)	(364)	8.9	1.9	(57)	(612)
F(2, 209), *p* value			0.8, .47				0.1, .88				2.7, .07				3.1*, .045				0.3, .74	
Rank: Junior	12.7	0.4	(1,706)	(14,370)	2.9	0.3	(363)	(14,370)	39.8	2.5	(584)	(1,706)	39.7	3.3	(220)	(566)	12.1	1.3	(143)	(1,140)
Rank: Senior	13.2	0.6	(1,260)	(9,497)	2.5	0.2	(240)	(9,497)	44.8	3.0	(480)	(1,260)	34.1	2.7	(175)	(472)	7.0	1.4	(65)	(788)
Rank: Officer	12.0	1.1	(378)	(3,060)	1.2	0.3	(32)	(3,060)	40.6	5.1	(130)	(378)	17.0	4.0	(21)	(130)	5.3	2.2	(11)	(248)
F(2, 209), *p* value			0.5, .62				7.8*, <.001				0.8, .46				9.8*, <.001				7.0*, .001	
Total	12.7	0.4	(3,344)	(26,927)	2.5	0.2	(635)	(26,927)	41.8	1.6	(1,194)	(3,344)	33.9	1.9	(416)	(1,168)	9.2	0.9	(219)	(2,176)
Preenlistment suicidality risk	61.2	1.3	(2,164)	(3,344)	56.7	3.4	(390)	(635)	55.7	2.0	(739)	(1,194)	57.9	4.2	(262)	(416)	53.5	5.2	(128)	(219)

(continued)

TABLE 1
(continued)

	Total sample								Ideators				Ideators with plan				Ideators without plan			
	Lifetime ideation				Lifetime attempt				Lifetime plan				Lifetime attempt				Lifetime attempt			
	%	*SE*	*n* numerator	*n* denominator	%	*SE*	*n* numerator	*n* denominator	%	*SE*	*n* numerator	*n* denominator	%	*SE*	*n* numerator	*n* denominator	%	*SE*	*n* numerator	*n* denominator
Women																				
Component: Regular Army	21.1	0.9	(530)	(2,751)	5.2	0.6	(155)	(2,751)	44.7	3.3	(233)	(530)	37.3	4.8	(105)	(227)	15.1	2.5	(50)	(303)
Component: Guard-reserve	11.4	2.3	(45)	(304)	4.0	1.4	(15)	(304)	68.0	9.4	(30)	(45)	49.3	7.9	(14)	(29)	7.1	6.9	(1)	(16)
F(1, 210), *p* value			12.4*, <.001				0.7, .42				3.5, .06				1.1, .29				1.1, .30	
MOS: Combat arms	13.5	2.3	(40)	(217)	4.5	1.6	(14)	(217)	46.5	9.9	(19)	(40)	60.1	12.1	(11)	(19)	10.3	6.5	(3)	(21)
MOS: Combat support	20.7	2.0	(160)	(765)	5.8	1.1	(50)	(765)	44.8	6.0	(73)	(160)	44.4	9.0	(36)	(72)	15.6	3.9	(14)	(88)
MOS: Combat service support	20.6	1.0	(375)	(2,073)	4.9	0.6	(106)	(2,073)	46.4	4.1	(171)	(375)	34.9	5.3	(72)	(165)	14.8	3.5	(34)	(210)
F(2, 209), *p* value			3.8*, .024				0.3, .74				0.0, .97				1.3, .27				0.3, .77	
Rank: Junior	17.9	1.2	(299)	(1,723)	6.2	0.9	(103)	(1,723)	50.5	4.7	(138)	(299)	48.8	6.4	(75)	(136)	21.3	4.9	(28)	(163)
Rank: Senior	21.8	2.0	(183)	(887)	5.0	0.8	(53)	(887)	41.7	5.3	(87)	(183)	35.7	6.7	(34)	(82)	14.5	4.4	(19)	(101)
Rank: Officer	22.8	1.9	(93)	(445)	2.5	0.7	(14)	(445)	44.4	6.3	(38)	(93)	19.6	6.2	(10)	(38)	3.9	2.1	(4)	(55)
F(2, 209), *p* value			2.4, .09				5.0*, .007				0.8, .45				4.3*, .015				6.1*, .003	
Total	20.1	0.9	(575)	(3,055)	5.1	0.5	(170)	(3,055)	46.1	3.2	(263)	(575)	38.3	4.4	(119)	(256)	14.8	2.4	(51)	(319)
Preenlistment suicidality risk	70.0	2.6	(400)	(575)	64.3	6.1	(122)	(170)	68.6	4.1	(185)	(263)	65.7	7.8	(89)	(119)	61.4	10.6	(33)	(51)

*$p < .05$

junior and senior enlisted soldiers than officers [6.2%–5% versus 2.5%; $F(2, 209) = 5.0$, $p = .01$], but does not differ by component [$F(1, 210) = 0.7$, $p = .42$], or MOS [$F(2, 209) = 0.3$, $p = .74$]. As with males, the significant association of rank with suicide attempts among female soldiers is due to enlisted soldiers having significantly higher prevalence than officers of attempts both among planners [48.8%–35.7% versus 19.6%; $F(2, 209) = 4.3$, $p = .02$] and among ideators without a plan [21.3%–14.5% versus 3.9%; $F(2, 209) = 6.1$, $p < .001$] despite not differing in prevalence either of ideation [$F(2, 209) = 2.4$, $p = .09$] or of plans among ideators [$F(2, 209) = 0.8$, $p = .45$].

The last row in both the male and female panels of Table 1 presents a summary statistic about the timing of suicidality: the proportion of all cases where the outcome defined in the column first occurred prior versus subsequent to the soldier's age of enlistment. The majority of cases of each outcome among both males (53.4%–61.2%) and females (61.4%–70%) first occurred before age of enlistment. The highest proportion for both males and females is for ideation, with 61.2% of the males and 70% of the females with lifetime ideation reporting that they first thought about suicide prior to age of enlistment. The lowest proportion for both males and females, in comparison, is for impulsive suicide attempts (53.4%–61.4%), which is more likely than planned attempts to occur as of or after age of enlistment.

Additional insight into the timing of onset of suicide ideation, plans, and attempts comes from inspection of AOO curves (Figure 1). These curves have very similar shapes for males and females, with cumulative probability of onset of ideation and first attempts both quite low up to early adolescence, at which time cumulative risk rises sharply through the late teens and then increases with a reduced slope for males through their 30s and for females through their mid-20s and then decreases more at later ages. Another noteworthy consistency between the male and female AOO curves for ideation and attempts is that the two curves are closer to each other for both genders in adolescence than later ages, suggesting that the conditional probability of a first attempt among ideators is

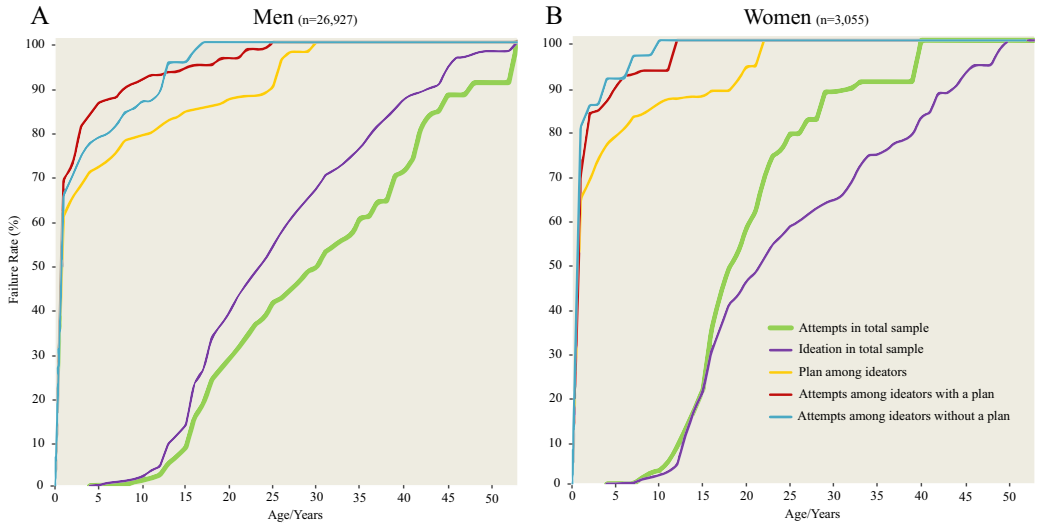

Figure 1. Age-of-onset and speed-of-transition curves for lifetime suicide ideation, attempts, plan among ideators, and attempts among those with and without a plan. *Note:* Age-of-onset curves (i.e., ideation and attempt in the total sample) were measured starting at age 4 of life. Speed-of-transition curves (i.e., plan among ideators, attempts among ideators with and without a plan) were measured starting at the first year after ideation. [Color figure can be viewed at wileyonlinelibrary.com]

highest in adolescence. The speed-of-transition curves do not take this possible interaction into account, but rather look at aggregate transitions between first having suicide ideation and first making a suicide plan, first developing a plan and first making an attempt, and first having suicide ideation and first making an unplanned attempt. These transitions are uniformly very rapid, with 60%–70% of plans and attempts occurring within the same year as the onset of the earlier phase of the transition.

Joint Associations of Command, MOS, and Rank with Suicidality Before and After Enlistment

Based on the results, we estimated a series of survival models in which we examined the joint associations of command, MOS, rank, and age (preenlistment versus postenlistment) with first onset of suicidality adjusting for the AOO distributions in Figure 1. It is noteworthy that command, MOS, and rank can all change over time, but were defined as of the time of survey in these analyses. This means that suicidality both prior to and after enlistment was "predicted" by characteristics of service that in the majority of cases did not occur until after the onset of the "outcomes." We used this approach in order to consider the possibility of unrecognized or unidentified factors leading to soldiers with prior suicidality subsequently ending up in different commands, MOSs, and ranks. Models were estimated separately for males and females. We also estimated models that combined males and females but found significant differences in associations by gender foreshadowed in Table 1 that justified focusing on gender-specific models (detailed results are available on request). We consequently focus on gender-specific models here. Whereas we estimated both additive models and models that included interactions of all other predictors with command, age, and both, the best-fitting model for suicide attempt was the one that included interactions with age but not command. The joint associations of the other predictors with first onset of suicide attempts were additive. This means, in particular, that the associations of MOS and rank with suicide attempts were not significantly different among Regular Army soldiers compared with soldiers in the G/R. This was true for both males and females.

Among males, the coefficients in the additive model in the total sample, where we ignored interactions with age, for the most part parallel the patterns seen previously in Table 1: a significantly elevated OR of suicide attempts among soldiers in the Regular Army versus the G/R (OR 2.5, 95% CI 1.7–3.5) due to elevated odds of ideation in the total sample and attempts among planners. As shown in Table 2, there is no significant association between command and unplanned attempts among ideators and, unlike in Table 1, there is no significant inverse association between being in the Regular Army and making plans among ideators. The time-varying coefficient for whether or not the soldier was yet enlisted also is nonsignificant (OR 0.9, 95% CI 0.6–1.4), indicating that no significant disjunction occurs in the underlying age distribution with enlistment. Despite model fit improving when interactions were added for the associations of other predictors with age, command and rank both remain significant in separate models for first suicide attempts preenlistment and postenlistment, with the only noticeable differences being more elevated ORs for both command and junior rank in the postenlistment model than the preenlistment model. Disaggregation also shows a remarkable consistency of component associations between the preenlistment and postenlistment models. For example, the relative-odds of planned, but not unplanned, attempts among ideators are significantly elevated for soldiers in the Regular Army versus G/R both before (OR 2.6 versus 0.6 for planned and unplanned attempts) and after (3.0 versus 1.1) enlistment. The only pre–post difference is a significantly decreased OR of plans among

TABLE 2
Predictors of Lifetime Suicidality in Male Only Sample, Weighted Analysis

	Total sample ($N_{persons}$ = 26,927)				Ideators ($n_{persons}$ = 3,344)		Ideators with plan ($n_{persons}$ = 1,168)		Ideators without plan ($n_{persons}$ = 2,176)	
	Lifetime ideation ($n_{person\text{-}years}$ = 653,626)		Lifetime attempt ($n_{person\text{-}years}$ = 681,557)		Lifetime plan ($n_{person\text{-}years}$ = 25,028)		Lifetime attempt ($n_{person\text{-}years}$ = 9,082)		Lifetime attempt ($n_{person\text{-}years}$ = 20,815)	
Model number and included variables	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Model 1 (total)										
Regular Army (vs. Guard-Reserve)	1.9*	1.5–2.4	2.5*	1.8–3.5	0.7	0.5–1.1	2.8*	1.8–4.3	0.8	0.4–1.6
MOS: Combat arms (vs. Combat service support)	1.1	0.9–1.2	1.2	0.9–1.5	1.0	0.7–1.3	1.4	0.9–2.2	1.0	0.6–1.8
MOS: Combat support (vs. Combat service support)	1.0	0.9–1.2	1.0	0.7–1.5	1.1	0.8–1.5	0.9	0.5–1.6	1.1	0.6–1.9
$F(2,209)$, p value	0.3, .76		0.8, .45		0.4, .68		2.2, .12		0.0, .96	
Postenlistment (vs. Preenlistment	0.9	0.8–1.1	0.9	0.6–1.4	0.9	0.8–1.1	0.6*	0.3–0.9	1.0	0.6–1.7
Rank: Junior (vs. Officer)	1.8*	1.4–2.1	4.6*	2.6–8.1	1.2	0.7–2.0	3.0*	1.6–5.7	2.9*	1.2–6.9
Rank: Senior (vs. Officer)	1.2	1.0–1.5	2.3*	1.3–4.2	1.2	0.7–2.0	2.1*	1.1–4.1	1.2	0.5–3.4
$F(2,209)$, p value	29.3*, <.001		23.9*, <.001		0.2, .79		5.5*, .005		7.2*, <.001	
Model 2 (preenlistment)										
Regular Army (vs. Guard-Reserve)	1.6*	1.2–2.1	1.7*	1.0–2.8	0.6*	0.4–1.0	2.6*	1.4–4.9	0.6	0.2–1.8
MOS: Combat arms (vs. Combat service support)	1.1	0.9–1.3	1.3	0.8–2.0	1.0	0.7–1.4	1.4	0.7–2.8	1.3	0.6–2.7
MOS: Combat support (vs. Combat service support)	1.1	0.9–1.3	1.1	0.7–1.7	1.0	0.7–1.5	1.0	0.5–1.9	1.2	0.6–2.5
$F(2,209)$, p value	0.8, .46		0.5, .63		0.0, .99		0.8, .46		0.3, .76	

(continued)

TABLE 2
(continued)

	Total sample ($N_{persons}$ = 26,927)				Ideators ($n_{persons}$ = 3,344)		Ideators with plan ($n_{persons}$ = 1,168)		Ideators without plan ($n_{persons}$ = 2,176)	
	Lifetime ideation ($n_{person\text{-}years}$ = 653,626)		Lifetime attempt ($n_{person\text{-}years}$ = 681,557)		Lifetime plan ($n_{person\text{-}years}$ = 25,028)		Lifetime attempt ($n_{person\text{-}years}$ = 9,082)		Lifetime attempt ($n_{person\text{-}years}$ = 20,815)	
Model number and included variables	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Rank: Junior (vs. Officer)	1.5*	1.2–1.8	3.6*	1.7–7.2	1.3	0.7–2.5	3.1*	1.2–7.5	1.8*	0.5–6.2
Rank: Senior (vs. Officer)	1.3*	1.0–1.5	2.3*	1.1–4.7	1.5	0.8–3.0	2.0	0.8–5.0	0.9	0.2–3.7
$F(2,209)$, p value	9.8*, <.001		7.2*, <.001		0.7, .49		3.1*, .046		2.4, 0.10	
Model 2 (post enlistment)										
Regular Army (vs. Guard-Reserve)	2.1*	1.5–2.9	3.4*	1.8–6.2	1.1	0.6–1.9	3.0*	1.3–6.7	1.1	0.4–3.2
MOS: Combat arms (vs. Combat service support)	0.9	0.8–1.1	1.1	0.7–1.7	1.0	0.6–1.6	1.5	0.7–3.2	0.8	0.4–1.8
MOS: Combat support (vs. Combat service support)	1.0	0.7–1.3	0.9	0.5–1.6	1.3	0.8–2.0	0.7	0.3–2.0	0.9	0.4–2.0
$F(2,209)$, p value	0.2, .79		0.2, .79		0.8, .45		1.1, .34		0.2, .86	
Rank: Junior (vs. Officer)	1.8*	1.2–2.6	5.0*	2.2–11.5	1.4	0.8–2.3	3.7*	1.4–9.7	6.0*	2.0–17.6
Rank: Senior (vs. Officer)	1.0	0.7–1.5	2.2	0.9–5.1	1.0	0.6–1.7	2.2	0.9–5.5	1.8	0.5–6.1
$F(2,209)$, p value	9.5*, <.001		14.9*, <.001		0.8, .44		4.9*, .009		9.4*, <.001	

Person-year interval variable ORs were not reported.
*$p < .05$

ideators preenlistment (0.6) that is nonsignificant postenlistment (1.1).

As with males, the coefficients in the additive model in the total sample of females (Table 3), where we ignored interactions with age, for the most part parallel the patterns seen previously in Table 1: significantly elevated ORs of suicide attempts among junior and senior enlisted soldiers compared with officers (OR 3.8, 95% CI 2.0–7.3 junior; OR 2.2, 95% CI 1.2–3.9 senior) due to elevated odds of both planned and unplanned attempts among ideators, but no significant elevations in either ideation or plans among ideators. As with men, the time-varying coefficient for whether or not the soldier was yet enlisted also is nonsignificant (OR 1.5, 95% CI 0.8–2.8), indicating that no significant disjunction occurs in the underlying age distribution with enlistment. Even though model fit improved when interactions were added for the associations of other predictors with age, rank remains the only significant predictor of both preenlistment and postenlistment suicide attempts, but with the elevated relative-odds among junior enlisted soldiers versus officers much more pronounced after enlistment than before (7.3 versus 2.2). Disaggregation shows consistency of component associations between the preenlistment and postenlistment models with the exception of a significantly elevated OR of ideation among junior enlisted soldiers versus officers in the postenlistment model (2.0), but not the preenlistment model (0.9).

DISCUSSION

There are six major limitations to this study. First, the relatively low AAS response rate and linkage rates limit the external validity of findings. Second, some respondents might have failed to report their suicidal thoughts or behaviors due to stigma (Zinzow et al., 2013), fear of breaches in confidentiality, or other reasons. Failures to disclose suicidal behaviors might have been related to some of the predictors considered here (e.g., possibly higher nondisclosure among men, combat arms, officers), which could introduce bias in tests of association between predictors and outcomes. Third, retrospective AOO reports might have been biased. Fourth, there may be cohort effects. For example, by examining risk factors across all ages, we might have obscured factors that increase risk of suicidal behaviors for soldiers that enlisted in the 1980s and 1990s, but not those that enlisted in the 2000s, or vice versa. Fifth, we examined only a limited set of Army characteristics as predictors of suicidal thoughts and behaviors. Sixth, there are several other factors (e.g., demographics) that could account for the associations in the current study. It is infeasible to test all possible interactions, but future Army STARRS studies will continue to examine how different factors work together to increase suicide risk.

Within the context of these limitations, there are several noteworthy findings from this study. First, the overall prevalence estimates from the Consolidated AAS sample are consistent with those found by Nock et al. (2014) in an initial AAS sample that did not include deployed soldiers or members of the G/R. Also consistent with this prior report as well as large representative samples from the general population (Nock et al., 2008), women have higher rates than men of each suicidal outcome examined. For instance, women have nearly twice the lifetime prevalence of men for suicide ideation (20.1% vs. 12.7%, respectively) and suicide attempts (5.1% vs. 2.5%, respectively). However, it should be noted that much of the increased risk of suicide attempts for women is accounted for by increased ideation.

Second, we found substantial preenlistment suicidal behaviors, suggesting that Army-related experiences (e.g., combat experiences) do not entirely account for suicidal behaviors in the Army. For example, the majority of nonfatal lifetime suicidal outcomes (e.g., 56%–70% of lifetime ideation, attempts, and suicide plans among those with ideation) experienced by Army soldiers had their first onset *before* the soldiers enlisted in

TABLE 3
Predictors of Lifetime Suicidality in Female Only Sample, Weighted Analysis

	Total sample ($n_{persons}$ = 3,055)				Ideators ($n_{persons}$ = 575)		Ideators with plan ($n_{persons}$ = 256)		Ideators without plan ($n_{persons}$ = 319)	
	Lifetime ideation ($n_{person\text{-}years}$ = 71,451)		Lifetime attempt ($n_{person\text{-}years}$ = 75,871)		Lifetime plan ($n_{person\text{-}years}$ = 3,949)		Lifetime attempt ($n_{person\text{-}years}$ = 1,783)		Lifetime attempt ($n_{person\text{-}years}$ = 2,972)	
Model number and included variables	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Model 1 (total)										
Regular Army (vs. Guard-Reserve)	2.2*	1.6–3.0	1.4	0.9–2.3	0.3*	0.2–0.5	0.7	0.4–1.4	2.3	0.3–16.4
MOS: Combat arms (vs. Combat service support)	0.7*	0.5–1.0	1.0	0.5–2.0	0.9	0.4–1.7	2.8	0.7–11.6	0.5	0.1–2.3
MOS: Combat support (vs. Combat service support)	1.1	0.9–1.4	1.2	0.8–1.6	0.6	0.4–1.1	1.6	0.8–3.6	0.4	0.1–1.2
$F(2,209)$, p value	3.3*, .041		0.4, .64		1.4, .24		1.3, .27		1.3, .28	
Postenlistment (vs. Preenlistment)	0.7*	0.6–0.9	1.5	0.8–2.7	0.8	0.5–1.3	0.9	0.5–1.7	2.6	0.8–8.6
Rank: Junior (vs. Officer)	1.1	0.9–1.5	3.8*	2.0–7.3	1.5	0.7–3.1	3.2*	1.4–7.5	6.1*	1.3–27.8
Rank: Senior (vs. Officer)	1.1	0.8–1.3	2.2*	1.2–3.9	0.8	0.5–1.5	2.6*	1.0–6.8	4.3*	1.0–18.1
$F(2,209)$, p value	0.5, .63		7.8*, <.001		2.9, .06		3.6*, .030		2.8, .06	
Model 2 (preenlistment)										
Regular Army (vs. Guard-Reserve)	2.1*	1.4–3.1	1.0	0.6–1.7	0.2*	0.1–0.5	0.5	0.2–1.2	2960.0*	417.0–20047.0
MOS: Combat arms (vs. Combat service support)	0.7	0.4–1.0	0.8	0.4–1.7	0.7	0.4–1.5	2.7	0.6–11.7	0.3	0.0–2.6
MOS: Combat support (vs. Combat service support)	1.2	0.9–1.7	1.1	0.8–1.7	0.4*	0.2–0.9	1.3	0.5–3.4	0.5	0.2–1.3
$F(2,209)$, p value	3.5*, .03		0.5, .62		2.8, .06		0.9, .41		1.3, .27	
Rank: Junior (vs. Officer)	0.9	0.6–1.2	2.3*	1.1–4.8	1.3	0.5–3.5	2.2	0.9–5.4	5.9	0.7–52.9
Rank: Senior (vs. Officer)	1.0	0.7–1.4	2.3*	1.0–5.4	0.7	0.3–2.0	2.5	0.7–8.2	13.9*	1.9–102.0

(continued)

TABLE 3
(continued)

	Total sample ($n_{persons}$ = 3,055)				Ideators ($n_{persons}$ = 575)		Ideators with plan ($n_{persons}$ = 256)		Ideators without plan ($n_{persons}$ = 319)	
	Lifetime ideation ($n_{person\text{-}years}$ = 71,451)		Lifetime attempt ($n_{person\text{-}years}$ = 75,871)		Lifetime plan ($n_{person\text{-}years}$ = 3,949)		Lifetime attempt ($n_{person\text{-}years}$ = 1,783)		Lifetime attempt ($n_{person\text{-}years}$ = 2,972)	
Model number and included variables	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
F(2,209), *p* value	0.7, .50		2.3, .10		2.5, .09		1.5, .23		3.9*, .022	
Model 2 (post enlistment)										
Regular Army (vs. Guard-Reserve)	2.4*	1.4–4.0	2.8	0.9–8.5	0.4*	0.2–0.9	1.7	0.4–7.0	0.8	0.1–8.0
MOS: Combat arms (vs. Combat service support)	0.6	0.3–1.3	1.2	0.3–5.3	1.2	0.3–4.9	3.9	0.4–41.1	0.6	0.1–5.4
MOS: Combat support (vs. Combat service support)	1.0	0.6–1.5	1.2	0.6–2.5	1.0	0.5–2.0	2.7	1.0–7.8	0.2	0.0–1.4
F(2,209), *p* value	0.7, .49		0.1, .90		0.0, .96		1.9, .16		1.3, .28	
Rank: Junior (vs. Officer)	2.0*	1.2–3.4	7.3*	2.1–26.0	2.4	0.9–6.5	12.4*	1.6–99.1	7.3*	1.4–37.2
Rank: Senior (vs. Officer)	1.2	0.8–1.9	1.9	0.5–7.1	1.1	0.4–2.9	4.6	0.5–39.8	0.7	0.1–3.7
F(2,209), *p* value	4.1*, .018		6.1*, .003		2.6, .08		2.9, .06		5.0*, .008	

Person-year interval variable ORs were not reported.
*$p < .05$

the Army. Notably, these high rates of preenlistment suicidal outcomes also are directly consistent with prior studies of new soldiers reporting similar rates of preenlistment suicidal outcomes (Ursano, Heeringa et al., 2015), and indirectly consistent with prior studies of new soldiers going through BCT (Nock et al., 2015; Rosellini et al., 2015) showing high rates of preenlistment mental disorders, which are strong predictors of subsequent suicidal behavior (Nock et al., 2014, 2015). Taken together, these findings show clearly that a substantial number of recruits elude the Army's efforts to identify and reject applicants with preexisting suicidal histories. Therefore, additional outreach and intervention efforts for soldiers may help reduce suicidal behaviors within the Army. Additionally, permitting soldiers with mental health difficulties or previous suicidal behaviors to join the Army may increase disclosure and provide the Army with information about which soldiers might require additional monitoring and intervention.

Third, we found that risk varied among different career characteristics. For example, a new finding in this study is that soldiers in the Regular Army, compared with those in the G/R, have higher rates of suicide ideation (males and females) and attempts (males only). For men, the higher prevalence of suicide attempts among those in the Regular Army is accounted for by higher rates of both lifetime ideation and suicide attempts among those with a suicide plan and this was the case for during both pre- and postenlistment. Future Army STARRS studies will explore associations with on-the-job experiences that may be associated with increased risk for suicide attempts and may help explain this finding. For women, those in the Regular Army show higher rates of suicide ideation but similar rates of attempting suicide. This latter null result could be due to low statistical power, as only 15 women in the G/R attempted suicide. This overall finding of higher prevalence of ideation and attempts among Regular Army relative to G/R is partially consistent with prior studies on suicide death in the military in which active duty personnel across all branches showed higher rates of suicide death that those in Reserve and National Guard positions; however, the higher rates were not statistically significant (LeardMann et al., 2013). In contrast, it is inconsistent with a recent study that found that among new soldiers in BCT, G/R soldiers have higher rates of lifetime ideation and similar rates of lifetime attempts relative to those in the Regular Army (Ursano, Heeringa et al., 2015). These inconsistent results could be due to differences between the types of G/R soldiers included in the present study (i.e., activated G/R soldiers of all ages) and those included in the study focused on BCT (i.e., new recruits). For example, G/R soldiers with a history of suicidal behaviors may be less likely to achieve (and remain at) active duty status (thus lowering the rate of suicide ideation and attempt among those captured in the current study). Future studies examining suicidal behavior among G/R at various stages of their Army career are needed to gain a clearer understanding of the prevalence, as well as risk and protective factors, of this group of servicemembers.

Fourth, along with being in the Regular Army, the other career characteristic significantly associated with suicidal behaviors is being in an enlisted rank, particularly a junior rank. Interestingly, enlisted soldiers and officers do not differ in the prevalence of suicide ideation or plans. Instead, these results showed that enlisted soldiers have higher rates of suicide attempts because they are more likely than officers to act on their suicidal thoughts or plans. Increased risk of suicidal behavior among enlisted soldiers is consistent with an earlier AAS paper (Nock et al., 2014) and several other studies looking at suicidal behaviors and suicide death (Allen, Cross, & Swanner, 2005; Bachynski et al., 2012; Hyman, Ireland, Frost, & Cottrell, 2012; Schoenbaum et al., 2014; Skopp, Zhang, Smolenski, & Reger, 2016) as well as a prior study within the Regular Army that found that, compared with officers, enlisted troops had higher 30-day prevalence for nearly all

internalizing and externalizing mental disorders (Kessler et al., 2014).

Fifth, the results suggest that Army-related experiences could not entirely account for the higher risk found in some careers. The two career characteristics with higher prevalence of suicidal outcomes—being in the Regular Army or being an enlisted soldier—showed elevated rates of increased risk both before and after joining the Army. This suggests that careers with higher prevalence of suicidal behaviors show this increased risk, at least in part, because people with preexisting vulnerabilities select these careers. One possibility could be that people with externalizing disorders, which are associated with suicidal behaviors in the Army (Nock et al., 2014, 2015), are more likely to join the Regular Army or join in an enlisted rank. Future studies are needed to further investigate this possibility and to identify other possible explanations for this association.

Sixth, against expectations, we observed no increased risk of suicidal behaviors among those in combat-related occupations. This is inconsistent with prior studies reporting increased suicide death among combat arms occupations (Helmkamp, 1996; Kessler et al., 2015; LeardMann et al., 2013; Trofimovich et al., 2013), but consistent with a recent case–control study that found that, compared with troops in other occupations, those in combat-related occupations had a lower prevalence of suicide attempts and no greater risk of suicide death (Skopp et al., 2016). There are at least two explanations why these occupations would be associated with suicide death but not nonlethal suicidal behaviors. First, those in combat-related positions could be more likely to conceal prior suicidal behaviors because of cultural norms that include avoiding negative emotions or stimuli that produce them (Bryan, Stephenson, Morrow, Staal, & Haskell, 2014), withholding expressions of negative or difficult emotions (Jakupcak, Blais, Grossbard, Garcia, & Okiishi, 2014), and stigma associated with reporting mental health problems or using mental health services (Hoge, Auchterlonie, & Milliken, 2006; Zinzow et al., 2013). Second, combat arms soldiers may truly have similar rates of suicidal behaviors as other occupations but be more likely to act on suicidal thoughts with more lethal means, such as firearms (Shenassa, Catlin, & Buka, 2003), resulting in death.

Interestingly, women in combat arms occupations had lower odds of suicide ideation than other women, an association not observed among men. Given the rigorous standards one must meet to be considered fit for these occupations (Servick, 2015), this reduced suicide risk may represent a resilience among women that select and meet the requirements for combat arms occupations, only a few of which were open to women at the time of the study. This finding does not conflict with the prior study examining suicide death among occupational specialty (Kessler et al., 2015) because that study did not examine suicide ideation and the two identified high-risk occupations were closed to women during the period of data collection. Additional well-powered studies are needed to further examine the risk and protective factors for suicidal behaviors among female soldiers.

This study provides new information about the prevalence of suicidal behaviors in the Army as well as about the role of Army history variables as risk and protective factors for suicidal behaviors. Future studies using this Consolidated AAS will examine a much broader set of potential risk and protective factors for suicidal behavior among Army soldiers. Taken together, this series of studies aims to improve the understanding, prediction, and prevention of suicidal behavior among Army soldiers.

AUTHOR CONTRIBUTIONS

Kessler had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Ursano and Kessler participated in conception and design of Army STARRS; Nock, Kessler, and Millner participated in conception and design of the

data analysis plan for the current paper; Ursano, Kessler, and Sampson participated in acquisition of AAS data; Kessler, Millner, Nock, and Zaslavsky participated in analysis and interpretation of data; Millner, Nock, and Kessler drafting of the manuscript; all authors participated in critical revision of the manuscript for important intellectual content; Hwang, King, Sampson, and Zaslavsky participated in statistical analysis; Ursano, Stein, Kessler obtained funding; all authors participated in administrative, technical, or material support; Kessler, Nock, Sampson, and Zaslavsky participated in supervision.

FINANCIAL DISCLOSURE

In the past 3 years, Dr. Kessler received support for his epidemiological studies from Sanofi Aventis, was a consultant for Johnson & Johnson Wellness and Prevention, and served on an advisory board for the Johnson & Johnson Services Inc. Lake Nona Life Project. Kessler is a co-owner of DataStat, Inc., a market research firm that carries out health care research. Dr Stein has been a consultant for Healthcare Management Technologies, Janssen Pharmaceuticals, Pfizer, and Tonix Pharmaceuticals. The remaining authors report nothing to disclose.

FUNDING/SUPPORT

Army STARRS was sponsored by the Department of the Army and funded under cooperative agreement number U01MH087981 with the U.S. Department of Health and Human Services, National Institutes of Health, National Institute of Mental Health (NIH/NIMH). The contents are solely the responsibility of the authors and do not necessarily represent the views of the Department of Health and Human Services, NIMH, the Department of the Army, or the Department of Defense.

ROLE OF THE SPONSORS

The sponsors specified the topic in the RFP but had no role in the design of the study. However, as a cooperative agreement, collaborating scientists appointed to the project by NIMH and Army liaisons/consultants participated in the refinement of the study protocol originally proposed by Ursano, Kessler, and the other initial Army STARRS collaborators. None of the Army or NIMH collaborators was involved in planning or supervising data analyses for this report, but they did read a draft and offered suggestions for revision. Although a draft of this manuscript was submitted to the Army and NIMH for review and comment prior to submission, this was with the understanding that comments would be no more than advisory. Other than for the above, the funding organization played no role in the design or conduct of the study; collection, management, analysis, or interpretation of the data; preparation, review, approval of the manuscript; or decision to submit the manuscript for publication.

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Manuscript Received: October 7, 2016
Revision Accepted: January 9, 2017

APPENDIX: THE STARRS-LS COLLABORATORS

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Additional Information: A complete list of Army STARRS publications can be found at http://www.STARRS-LS.org.