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Health Spillovers Among Military Spouses: Evidence from Active Duty, Veteran, and Surviving Spouses

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Abstract

Using three subsamples from the 2010 *National Survey of Veterans* (Westat 2010), this study explores health spillovers—the effects of the experience of one person on the health of another—from service personnel to their spouses. Regression models point to broad and substantial spillovers, occurring over multiple stages of a military career. The spouses of active duty personnel report worse health relative to those living with a veteran, and this difference in health is comparable to the well-established effect of widowhood on health. In addition, the health of military spouses declines when their spouses suffer from service-connected disabilities. There is no evidence that the widowhood effect is larger when the death is service-connected, nor is there evidence that caring for a disabled spouse is more detrimental when it happens at younger ages, a common situation among military spouses. Nonetheless, the health of military spouses is impacted by an assortment of spillovers related indirectly and directly to military service, and occurring both among those married to active personnel and those married to veterans.

Keywords: military spouses, widowhood effect, stress, health spillovers, social determinants of health

Introduction

Health spillovers within the household are well-documented, but not completely understood or appreciated. Perhaps the most well-known example is the so-called widowhood effect, involving significantly higher mortality following the death of a spouse (Elwert & Christakis, 2008; Shor et al., 2012). There are, however, other examples, including an increase in depression following involuntary separation from a spouse (Turney, Schnittker, & Wildeman, 2012), the stress of one spouse reverberating to the health of the other (Brock & Lawrence, 2008), and the deterioration of one spouse's health as a consequence of caring for a disability in the other (Schulz & Beach, 1999).

It is useful to explore this issue not only from the standpoint of the kinds of *exposures* behind spillovers, but also the kinds of *people* most vulnerable to them. To this end, this study explores the spouses of military service members. Given their experiences, military spouses provide an especially useful window into the topic, as they experience multiple types of spillover at multiple times, and evidence already points to a close relationship between the well-being of one spouse and that of the other (e.g., Beck, Ruhlmann, & Nelson Goff, 2018; Drummet, Coleman, & Cable, 2004). There are several reasons military spouses are unique.

For one, the stress experienced by active duty spouses can sometimes be severe, as when their spouse participates in active conflict or when spouses are otherwise separated for long periods of time as part of a deployment (Eaton et al., 2008; Steenkamp et al., 2018). The military has long been acknowledged as a "greedy" institution, demanding extraordinary commitment, sacrifice, and patience for those who serve in it (Segal, 1986). In addition, though, military spouses are exposed to spillovers long after their spouse leaves the service. The widowhood effect, for instance, might be greater among the spouses of veterans relative to civilians, especially when the death is related to their service or is otherwise premature. In addition, veterans often leave the service with significant disabilities, increasing the burden of care among spouses.

To date, the situation of the military spouses has been evaluated mostly in a piecemeal fashion. Research has generally not considered a variety of spillovers simultaneously. For instance, in the context of family relationships studies have explored the situation of veterans suffering from Post-Traumatic Stress Disorder (PTSD) specifically (e.g., Nelson Goff et al., 2016). Similarly, studies have explored the stress of active deployment among spouses and how they attempt to cope with a long separation (e.g., Lester et al., 2010). Studies have generally, however, not compared the stress of active deployment relative to the stress of caring for a veteran who has returned. Nor have studies sought to explore spillovers over multiple stages of a military career, from active duty to veteran status. Studies of spillovers have focused largely on active deployment or the early stages of the return to civilian life, as in the circumstances surrounding reunion (Drummet, et al., 2004). This study seeks to evaluate these possibilities in a more comprehensive fashion. To this end, it explores multiple spillovers simultaneously, including the stress of being married to an active duty service member, the stress of caring for a veteran with a service-related disability, and the widowhood effect stemming from the death of a veteran with a service-related condition. This study also seeks to evaluate what sociodemographic influences might make the stress experienced by military spouses unusual, including the relatively early age at which some are widowed or at which they begin to care for a disabled spouse.

Background

Spillovers are an important aspect of the health of families (Al-Janabi, van Exel, Brouwer, & Coast, 2016). There are two general types of spillovers. First, a spillover can refer to the situation of one spouse affecting the health of the other. There are many examples of such a spillover, though recent research has focused on the impact of involuntary separation, as well as work-related stress of one spouse spilling over to the other (Freudenberg, Daniels, Crum, Perkins, & Richie, 2008; Glasier & Arbeau, 2017; Orthner & Rose, 2009). Both can significantly undermine the health of a spouse.

Second, a health spillover can refer specifically to the health of one spouse affecting the health of the other. The widowhood effect is the most well-documented spillover in this regard and pertains to a significant increase in mortality subsequent to a spouse's death (Elwert & Christakis, 2008; Shor, et al., 2012; Smith & Zick, 1996). Similar patterns, however, have been found for outcomes short of mortality, including for spouses dealing with poor health, disability, or a difficult transition in the lives of their partners (Beach, Schulz, Yee, & Jackson, 2000; Lee, Colditz, Berkman, & Kawachi, 2003).

For several reasons, the spouses of service members are perhaps especially at-risk for spillovers of this sort. On the one hand, the spouses of active duty service members often suffer from considerable stress. To be sure, the stress is likely mostly pronounced during active combat operations, when the risk of death is naturally high, uncertainty is common, and communication is limited (Carter & Renshaw, 2015; Everson, Herzog, Figley, & Whitworth, 2014), but it is still significant even under more mundane service conditions (Padden, Connors, & Agazio, 2010). Some authors characterize the stress of military spouses as emanating from aspects of the military lifestyle, including stressful training exercises, frequent movement between military bases, and erratic and unpredictable schedules (Burrell, Adams, Durand, & Castro, 2006). In addition, military spouses often suffer from other social experiences detrimental to health, if not directly related to their spouse. For instance, the spouses of active duty service personnel generally experience higher levels of unemployment than those who are comparable in age and human capital (Maury & Stone, 2014). In addition, military service tends to occur at a stage in the life course when other family obligations are pressing. Many active duty spouses, for instance, have young children, accentuating the burden associated with having a spouse who is frequently away (Clever & Segal, 2013).

The potential for spillovers continues long after the transition out of active duties. For one, veterans often return to civilian life with service-related injuries and disabilities, some of which can be severe (MacLean & Elder, 2007). The most obvious are injuries sustained in combat or as a consequence of combat. For instance, nearly a quarter of veterans with a service-connected disability suffer from PTSD specifically, which has consequences for the well-being of spouses (Ahmadi, Azampoor-Afshar, Karami, & Mokhtari, 2011; Maynard, Batten, Liu, Nelson, & Fihn, 2017). In fact, however, veterans suffer from a variety of other potentially disabling conditions as well, including diabetes, migraine, and tinnitus, and these, too, are potentially consequential for the health of a spouse (Maynard, et al., 2017). Many people experience such a situation. Over a million family members serve as primary caregivers to Post-9/11 veterans alone (Delgado et al., 2018). The spouses of veterans are also exposed to the widowhood effect. This plainly applies to service members killed in service, but post-service mortality among certain veterans is also higher than average, including among combat veterans (Boehmer, Flanders, McGeehin, Boyle, & Barrett, 2004; Elder, Shanahan, & Clipp, 1994; London & Wilmoth, 2006).

In addition to the variety of potential kinds of spillovers military spouses are exposed to, military spouses are unusual in the life stage in which these spillovers likely occur. The spouses of service members are not, of course, the only people caring for a spouse with disabilities, nor are they the only people subject to the widowhood effect. Yet, the conditions surrounding spillovers among military spouses are different in important respects and, for this reason, potentially more damaging. In general, the conditions surrounding the death of a spouse contribute to the strength of the widowhood effect in ways that can apply specifically to those married to veterans (Stroebe, Schut, & Stroebe, 2007). Deaths from accidental and violent causes, for instance, have more impact on the subsequent mortality of a surviving spouse than deaths from heart disease and cancer (Kaltman & Bonanno, 2003; Martikainen & Valkonen, 1996). It is possible that among those married to veterans, deaths from causes linked to their military service may be more consequential, given that the leading causes of death differ between veterans and the general US population (Weiner, Richmond, Conigliaro, & Wiebe, 2011). Further accentuating these possibilities is the typical age in which spouses are affected. Caring for a disabled spouse can adversely affect the caregiver, though among those married to veterans, the risks may be even greater given that service-related disabilities tend to begin at a younger age. Life transitions that occur at a non-normative stage tend to be more consequential for health and well-being (Hurwicz, Durham, Boyd-davis, Gatz, & Bengtson, 1992; Neugarten, 1979), and caring for a disabled spouse is relatively rare among middle-aged adults (Marks, 1998). Relative to those with no military service, veterans suffer from more disability and at younger ages (Holder, 2016). By the same token, when a death is service-connected it tends to be at a relatively young age and evidence indicates that, in general, the widowhood effect is stronger when the death is premature (Bedard & Deschênes, 2006; Shor, et al., 2012; Smith & Zick, 1996). Excess mortality among veterans relative to non-veterans is large after the age of 65, though veterans also experience considerable excess mortality in the 40 to 54 age range (Bedard & Deschênes, 2006).

To all these possibilities there are alternatives. Indeed, it is possible that relative to those married to spouses not involved with the military, military spouses are less subject to spillovers because of countervailing influences particular to careers in the armed forces. The spillover effects of involuntary separation from a spouse, for instance, are often shaped by social isolation, though among military spouses there are often informal support networks, especially on military bases (Huebner, Mancini, Bowen, & Orthner, 2009). In addition, the spouses of active duty personnel and veterans have access to benefits generally not available to others, thereby potentially diminishing, for instance, the socioeconomic impact of the death of a spouse or allowing the surviving spouse easier

access to healthcare. For these reasons, it is important to consider spillovers among military spouses in an empirical fashion.

Research Questions

Using survey data on the spouses of current service members and veterans, combined with data on the widows of veterans, this study examines three related questions:

1. What are the consequences of living with an active duty service member, caring for a disabled veteran, and widowhood for the health of military spouses?
2. Can high unemployment and caring for young children help to explain any negative impact of being married to an active duty service member on health?
3. Are the consequences of any spillovers greater among those experiencing them at younger ages?

Data

Data from this study are drawn from three related studies fielded as part of the 2010 *National Survey of Veterans* [(NSV) (Westat 2010)]. The current study presents a secondary data analysis, based on data collected for other purposes. Nonetheless, the data are well-suited to the research questions. The NSV is an ongoing survey fielded by an independent research firm, Westat, on behalf of the US Department of Veteran Affairs. The data collection procedures and basic descriptive information are provided in Westat (2010). In 2010, the NSV survey included for the first time, the spouses of veterans, in recognition of the fact that the vast majority of veterans are married. Three specific sample components were added to the 2010 NSV: the spouses of deceased veterans, referred to as the surviving spouse sample, the spouses of US active duty military personnel, including those serving in the National Guard and Reserve, and a survey of veteran spouses.

The NSV survey was conducted using either a web-based or mailed self-administered questionnaire, depending on respondent preference. Households with eligible participants were first identified using either a list of potential respondents (in the case of active duty spouses, for which the VA has records), or address-based sampling, based on lists from the US Postal Service (in the case of veteran spouses and surviving spouses of veterans, for which a list was not available and a list of benefit recipients would be inadequate). In addition, the survey employed a short screening survey in order to identify eligible respondents sampled in the address-based sampling frame (i.e., the presence of one or more household members who were or are spouses of veterans). The response rate for the screening survey was 32.3%, while the response rate among eligible respondents for the NSV as a whole was 66.7%. The percentage of veterans who responded to the survey overall was estimated at 38.8%. The effective coverage rate for spouses in particular was comparable, at 34%, though the response rate was higher among older spouses.

Weights were created by Westat to represent the entire non-institutionalized veteran population, including information on the probability of selection, survey nonresponse, and post-stratification based on established demographic information regarding veterans and spouses. These weights were used in all the analyses presented in this study. The total sample size for all three components was 1,358. After dropping 98 cases that did not provide sufficient information to code key variables, including especially self-rated health, the final sample size was 1,260 (for additional information on sample size and basic demographic information see Westat 2010). All the calculations presented in this study are based on raw data files with the analyses performed using STATA (Statacorp, 2013). Data were provided to the author following a Freedom of Information Act request. The NSV survey includes basic indicators of respondent health, including self-rated health, as well as demographic information.

Service-related exposures

This study is primarily interested in service-related spillovers among the spouses of current service members and veterans. Three variables capture these spillovers. The first corresponds with whether the respondent's spouse is currently on active duty, representing respondents in the active duty sample. The second is those respondents who were married to now-deceased veterans, denoted as the surviving sample (or survivors) and capturing any potential widowhood effect. For some analyses, this category of spillover is further divided between those whose spouse's death was service-related and those whose was not based on respondent reports. And the third, is those currently living with a veteran who has some kind of service-connected disability, based again on respondent reports.

Several facets of these variables are important. There are no active duty spouses apart from the active duty sample. By the same token, there is no one living with a spouse with a current service-connected disability who is not drawn from the veteran spouse survey. The surviving spouse sample includes those who were *formerly* living with a veteran with a service-connected disability, though the covariate included in the model includes only those *currently* living with a disabled spouse, to better capture the burden of care. The models also include a covariate indicating whether the spouse is serving or ever did serve during years of active conflict, from World War II to the conflicts following September 11th. Because the surveys were conducted in 2010, every participant in the active duty sample is coded as serving during a conflict period.

Self-rated health

The central outcome of this study is self-rated health. Respondents were asked, "In general, would you say your health is excellent, very good, good, fair, or poor?" Self-rated health is an especially strong predictor of mortality and is a well-validated comprehensive indicator of morbidity (Idler & Benyamini, 1997). In this study, self-rated health is modeled as a continuous outcome using linear regression with higher values, scored 1 to 5, reflecting better health.

Other respondent characteristics

The models also include a variety of control variables, including age (in years), sex (about 6% of the sample is male), educational degrees, the presence of children under the age of 18 in the household, and race/ethnicity, divided into four groups, non-Hispanic white, black, Hispanic, and other race/ethnicity.

Results

Table 1 (next page) begins with descriptive statistics. The descriptive statistics are arrayed over the three subsamples. The average age of the three groups differs in expected ways, with the survivor sample considerably older than the active duty sample and the veteran sample in between. In addition, the samples differ in the percent of respondents who are unemployed. At 18%, unemployment among active duty spouses is much higher than in the other groups. Most spouses in the sample have or had a spouse who served in a period with active combat operations. This is true of 100% of the active duty spouses, who are serving in Post-9/11 operations, but also true of at least 66% of survivors and veteran spouses. In addition, active duty spouses are considerably more likely to have children under the age of 18 in the household. Active duty spouses also, however, have higher levels of educational attainment on average. Service-related disability among veterans is not uncommon, occurring in just over 12%. And among surviving spouses approximately 12% of deaths were related to the service of the veteran.

Table 1. Descriptive Statistics, 2010 National Survey of Veterans, Spouse Surveys (N=1,260)

	Veteran Spouses	Surviving Spouses	Active Duty Spouses
Self-Rated Health (1 = Poor, 5 = Excellent)	3.421	2.861	3.516
Age	60.7	75.7	42.1
Female	.953	.993	.927
Education (ref. Less than High School)			
High School or Some College	.580	.657	.468
Associate's Degree	.079	.037	.162
Bachelor's Degree	.207	.105	.193
Master's Degree	.077	.051	.118
Professional or Doctorate Degree	.017	.009	.029
Race/Ethnicity (ref. White)			
Black	.061	.057	.116
Hispanic	.051	.034	.235
Other	.049	.037	.074
Children under 17 in Household			
One	.074	.018	.250
Two or more	.103	.010	.457
Unemployed	.046	.015	.177
Service During Conflict Period	.719	.655	1
Service-Related Disability	.121	--	--
Service-Related Disability Under Age 60	.074	--	--
Service-Related Disability Age 60 or Over	.047	--	--
Spouse Death			
Spouse Death Under Age 60	--	.356	--
Spouse Death Age 60 or Over	--	.644	--
Service Related	--	.124	--
Non-Service Related	--	.876	--
N	499	693	68

Note: All calculations based on Westat's 2010 *National Survey of Veterans* survey data. Data and data collection procedures described in Westat 2010.

Table 2 (next page) presents linear regression models of self-rated health on the independent variables, beginning with a basic specification. The first model adjusts for education, race/ethnicity, age, and sex, whereas the second model adds three potential exposures, including service during an active conflict period, unemployment, and the presence of young children. The first model reveals remarkable symmetry in the three potential spillovers. The health of spouses of active duty service members is considerably lower than that of the spouses of veterans (the reference category).

Self-rated health is approximately .266 unites lower, with the standard deviation for self-rated health just over one. Statistically, this reduction is equivalent to the health effect of the death of a spouse. Survivors report lower self-rated health, too, of about .221 units, and these two coefficients are not significantly different from each other (ρ = .754). This difference in health among surviving spouses was not attributable to their advanced age: The models already adjust for age in a linear fashion and the inclusion of an age-squared term in the model was insignificant and did not alter the surviving spouse coefficient. In addition, the presence of a service-related disability in the veteran reduces the self-rated health of the spouse by about .280 units. This, too, is statistically equivalent to the other reductions.

Table 2. Regression of Self-Rated Health on Select Independent Variables, 2010 National Survey of Veterans, Spouse Surveys (N=1,260)

	Model 1	Model 2
Age	-0.016***	-0.015***
	(0.003)	(0.003)
Female	0.133	0.132
	(0.158)	(0.162)
Education (ref. less than high school)		
High School or Some College	0.596***	0.604***
	(0.119)	(0.120)
Associate's Degree	0.905***	0.913***
	(0.164)	(0.164)
Bachelor's Degree	1.040***	1.038***
	(0.140)	(0.142)
Master's Degree	1.421***	1.427***
	(0.150)	(0.152)
Professional or Doctorate Degree	0.846***	0.831**
	(0.253)	(0.252)
Race/Ethnicity (ref. White)		
Black	-0.049	-0.059
	(0.170)	(0.164)
Hispanic	-0.135	-0.130
	(0.144)	(0.147)
Other	-0.193	-0.206
	(0.142)	(0.138)
Active Duty Spouse	-0.266*	-0.310*
	(0.124)	(0.135)
Surviving Spouse	-0.221**	-0.219**
	(0.071)	(0.071)
Service Disability	-0.280*	-0.277*
	(0.127)	(0.130)
Service During Active Conflict		0.030
		(0.072)
Unemployed		0.085
		(0.166)
Children Under 17		
One		-0.132
		(0.163)
Two or More		0.172
		(0.157)
Constant	3.570***	3.492***
R^2	0.22	0.22

* p<0.05; ** p<0.01; *** p<0.001 (standard errors in parentheses)

Note: All calculations based on 2010 National Survey of Veterans survey data. Data and data collection procedures described in Westat (2010).

The second model introduces potential explanations for the worse self-rated health among the spouses of active duty personnel, including service during a combat period, unemployment, and the presence of young children. Although active-duty spouses experience all three at higher levels (relative to the spouses of veterans), these variables do not explain their lower health. Of note, service that coincided with an active conflict period is not significantly related to the health of the spouse.

These models reveal the impact of spillovers from service members to their spouses, but they do not reveal processes that are necessarily unique to service members. Table 3 (next page) tests this possibility in several ways. First, it explores whether the death of a spouse for service-related reasons is more consequential than a death for other reasons. Second, it explores whether spillovers experienced at relatively young ages are more consequential. In each case, the spillover is divided into two categories. In the first, the death of a spouse is divided into service and non-service related. In the second, the death of a spouse is divided into deaths that occurred when the spouse was under the age 60 and when the spouse was age 60 and over. By the same token, a service-related disability in the spouse is divided between spouses who are under age 60 and those who are age 60 and over. In each case, the difference between the two coefficients is in the expected direction, though none of the coefficients are significantly different from the other: A service-related death is not worse for the health of a spouse than is a non-service-related death, and death and disability under the age of 60 are not significantly more damaging to the spouse's health than death and disability age 60 and over (although the coefficients are numerically somewhat larger).

Discussion

It is important to understand spillovers from service members and veterans to their spouses as a way to assess the needs of service families, not just service members and veterans themselves. Service members and veterans are provided with considerable benefits for their health and well-being, but many of the risks that apply to service personnel also apply to their spouses. Although the armed forces have made a concerted effort in recent years to ease the burdens of service among military families, focusing in particular on families with young children (Hosek & Wadsworth, 2013), the situation of military spouses remains underappreciated, especially for those married to veterans and not active-duty personnel.

This study demonstrates the long-term impact of service experiences on the health of spouses. It shows, among other things, that many of the risks of a spouse's service continue long after the return to civilian life. The spillovers are remarkably consistent in their magnitude. The effects of being married to an active duty service member, for instance, are as large as the widowhood effect, which is, in turn, as large as caring for a veteran spouse with a service disability.

Although the spouses of veterans must often provide caregiving for a disability at a relatively young age, neither the widowhood effect nor the effect of spousal disability is significantly stronger at younger ages. By the same token, the widowhood effect is no greater for veterans who died of service-related causes than for those who died of non-service-related causes. The relatively worse health of the spouses of active duty personnel is not explained by active conflict at the time of the survey, nor is it explained by higher unemployment among spouses, neither of which is significantly related to self-rated health.

Although not the focus of this study, several patterns are notable. For one, there are no significant racial/ethnic differences in health in this study. In general, racial ethnic minorities report lower self-rated health than do non-Hispanic whites (Williams, Mohammed, Leavell, & Collins, 2010). In this study, however, none of the race/ethnic differences were significant relative to whites. By the same token, the unemployed do not report worse health than the employed, and the presence of young children does not adversely impact the health of military spouses. It is possible that the lack

Table 3. Regression of Self-Rated Health on Select Independent Variables, Contextual Models, 2010 National Survey of Veterans, Spouse Surveys (N=1,260)

	Model 1	Model 2	Model 3
Age	-0.016***	-0.017***	-0.016***
	(0.003)	(0.003)	(0.003)
Female	0.133	0.131	0.135
	(0.158)	(0.158)	(0.159)
Education (ref. less than high school)			
High School or Some College	0.595***	0.586***	0.598***
	(0.119)	(0.118)	(0.119)
Associate's Degree	0.905***	0.892***	0.907***
	(0.164)	(0.164)	(0.163)
Bachelor's Degree	1.040***	1.029***	1.041***
	(0.140)	(0.139)	(0.139)
Master's Degree	1.421***	1.409***	1.423***
	(0.150)	(0.150)	(0.150)
Professional or Doctorate Degree	0.846***	0.838***	0.850***
	(0.253)	(0.253)	(0.254)
Race/Ethnicity (ref. White)			
Black	-0.050	-0.050	-0.050
	(0.170)	(0.169)	(0.170)
Hispanic	-0.136	-0.140	-0.134
	(0.144)	(0.145)	(0.144)
Other	-0.193	-0.192	-0.194
	(0.142)	(0.141)	(0.143)
Active Duty Spouse	-0.266*	-0.280*	-0.271*
	(0.124)	(0.125)	(0.124)
Service Disability	-0.280*	-0.283*	
	(0.127)	(0.127)	
Surviving Spouse			-0.218**
			(0.071)
Non-Service Related Death	-0.219**		
	(0.072)		
Service-Related Death	-0.238		
	(0.143)		
Survivor at Under Age 60		-0.318***	
		(0.092)	
Survivor at Age 60 or Over		-0.151	
		(0.079)	
Service Disability Under Age 60			-0.327*
			(0.161)
Service Disability Age 60 or Over			-0.210
			(0.188)
Constant	3.571***	3.633***	3.582***
R^2	0.22	0.22	0.22

* $p<0.05$; ** $p<0.01$; *** $p<0.001$ (standard errors in parentheses). *Note*: All calculations based on Westat's 2010 *National Survey of Veterans* survey data.

of significant differences, reflects the sociodemographic climate of the armed forces, or the availability of significant benefits therein (Lucas, 2001). In military settings, health disparities tend to be lower (Bagchi et al., 2009), though recent evidence points to the persistence of racial disparities in important socioeconomic outcomes, including officer promotion (Burk & Espinoza, 2012). The exploration of racial/ethnic disparities in health in military settings deserves additional and more granular attention, especially as they implicate both military personnel and their spouses.

This study has several limitations. For one, the data are cross-sectional. Cross-sectional data present a threat to causal inference in general, though it is important to be specific regarding the potential biases that apply in this particular case. Because the sample is restricted to those currently or formerly married to service personnel, there is no possibility that the comparisons drawn here are contaminated by selection into marriages with a service-affiliated partner. The worse health of the spouses of active-duty personnel, for instance, cannot be explained by worse health among all of those married to current or former service members relative to those married to civilians. Nonetheless, other coefficients are more subject to bias. The effects of the death of a spouse, for instance, could reflect exposures shared by spouses rather than the death of a spouse *per se*. The best evidence suggests that the widowhood effect does not reflect such contamination and rather reflects "dying from a broken heart" (e.g., Elwert & Christakis, 2008), though the possibility of contamination is worth exploring further, especially if military spouses share more environmental influences than the average married couple. In addition, efforts to disentangle causality would be aided by larger samples. The present study found statistically significant associations where expected, though the standard errors for some of the coefficients were large and prevented more fine-grained and conclusive comparisons.

In addition, this study was unable to explore all potential spillovers. For instance, this study did not consider disability unrelated to military service, though such disability almost certainly matters for the health of spouses as well. There is also little information about the conditions surrounding active duty personnel's service activities, including whether they are serving overseas or in what capacity. By the same token, there is little information about potential social resources available to the spouse, which are a critical feature of coping. Studies find a significant moderating effect of social support (Skomorovsky, 2014) and a sense of community (Wang, Nyutu, Tran, & Spears, 2015) on the stress experienced by active duty spouses, something many military spouses may be able to draw on. Similarly, spouses who frequently discuss their military-based trauma experiences with their spouse tend to report better adjustment, a finding suggesting that trying to shield a spouse from trauma may fail to minimize the potential for a spillover (Nelson Goff, et al., 2016). Family-based intervention strategies can be helpful in alleviating post-deployment stress (Flora, Boje, Rosile, & Hacker, 2016).

Finally, this study was unable to explore alternative health outcomes. Self-rated health is a valid and comprehensive assessment of overall health with strong predictive validity with respect to mortality. Nonetheless, it is not clear what specific conditions may be implicated in some spouses' relatively worse health. Such information has important clinical implications and some studies have argued for symmetry in the specific health problems of service members and their spouses. For instance, research has explored the relationship between combat-related PTSD and a type of secondary traumatic stress disorder experienced by spouses (Diehle, Brooks, & Greenberg, 2017). The evidence on this precise linkage is limited. Research has shown that the PTSD of one spouse results only in general psychological distress in the other, if not PTSD-specific symptoms (Diehle, et al., 2017). Furthermore, research finds that fewer than 20% of those married to someone with PTSD attribute their own distress specifically to their spouse's military experience (Renshaw et al., 2011).

Nonetheless, it is useful to consider more specific health outcomes in order to discern more precisely the pathways that produce spillovers.

This study illuminates the breadth of spillovers among the spouses of armed forces personnel. Understanding why the spouses of active duty personnel report relatively low self-rated health is not fully explained in the models, though the findings serve as an invitation to explore them further. The findings also highlight the value of considering spillovers over the full tenure of a military career, from active duty personnel to veterans. At least from the standpoint of their impact on health, there is remarkable symmetry in the health effects of spillovers occurring at relatively young ages and those occurring on average much later. In this light, it is important to think of the pathways that can link even short military service to the long-term health of a spouse.

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