
Review of Well-Being in the Context of Suicide Prevention and Resilience

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ABSTRACT

Well-being is generally recognized as a vital and multi-dimensional component of health in both civilian and military contexts. The World Health Organization defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” Moreover, well-being has been identified as a critical aspect of military readiness by the recent United States Department of Defense Suicide Prevention Task Force and the current Principal Deputy Under Secretary of Defense for Personnel and Readiness. However, the concept of well-being poses challenges, including the lack of universally accepted definitions, its multi-dimensional structure, and the broad, eclectic understanding of health that it implies. This review will include a summary of 1) definitions, 2) dimensions, and 3) measures of well-being. This paper will also review the well-being literature in the context of both suicide risk/prevention and resilience in order to better understand the concept of well-being and how it relates to preventing suicide and enhancing resilience. In addition, this work will provide practical tools and recommendations for enhancing well-being and resilience in military groups, while reducing the risk for negative outcomes such as suicide.

1. INTRODUCTION

Well-being is generally recognized as a vital component of positive health in the international community, as well as in civilian and military populations. The World Health Organization (WHO) defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” [1]. This focus on positive health and wellbeing includes finding life satisfying and fulfilling, feeling energetic, and having the psychological and physical assets to assist in coping with life’s challenges [2]. Numerous studies demonstrate that well-being is associated with, and precedes important health and social benefits [3]. Well-being has even been proposed as a more important national indicator of population functioning than economic measures, such as gross national product and income levels, which provide little information about what people value in their daily lives [4]. In 2010, the the Department of Health and Human Services (DHHS) Healthy People 2020 initiative, which sets United States (US) national objectives for disease prevention and health promotion, endorsed monitoring population well-being [5]. Moreover, well-being has been identified as a critical aspect of military readiness by the recent US Department of Defense (DoD) Suicide Prevention Task Force (SPTF) [6] and the current Principal Deputy Under Secretary of Defense for Personnel and Readiness [7]. The general conclusion is that organizations and nations can benefit significantly by monitoring and supporting well-being.

This paper provides an overview of the concept of well-being, evidence for the relationship of well-being with military health-related readiness issues, and practical tools and tips that leaders can use to support the well-being of service members. The paper is organized by four questions:

1. What is well-being and how is it measured?
2. How does well-being relate to suicide prevention, resilience, and other health outcomes?
3. What factors contribute to well-being?
4. What can military leaders do to support the well-being of service members?

The paper approaches well-being from a public health and population-based approach, integrating findings from studies with international, civilian, and military populations. This approach is consistent with the WHO recommendations for the combination of prevention and promotion programs in mental health within overall public health strategies for reducing stigma, increasing cost-effectiveness, and providing multiple positive outcomes [2]. Although well-being is a complex concept and the evidence is variable, especially with regard to military populations, there is general evidence across conceptualizations and studies that well-being is a key health indicator.

2.0 WHAT IS WELL-BEING AND HOW IS IT MEASURED?

Well-being is a complex construct with a variety of definitions, dimensions, theoretical underpinnings, and measures. Well-being is generally agreed to have affective and cognitive components that are both independent and interactive. There are multiple theories about how well-being is maintained and enhanced. In addition, there are also many options for measuring well-being, which is partly due to the complexities with the different construct definitions, dimensions, and theories, as well as how well-being is applied by different disciplines (e.g., psychology, health economics, and cost-effectiveness studies). The review of well-being measures focuses on population-based and international methods given the public health approach being advocated by this paper and the NATO context of the meeting.

2.1 Well-being Definitions and Dimensions

Well-being is generally defined as either a variant or combination of two factors: positive affect, more commonly referred to as “happiness,” and satisfaction with life. These terms reflect the eudaemonic and hedonic philosophic traditions about what constitutes a good life. The hedonistic tradition focuses on pleasure and happiness. In contrast, the eudaemonic tradition is about the degree to which one realizes his/her true potential or unique capacity, commonly referred to as meaning, fulfilment or purpose in life

[8]. The majority of well-being definitions are aligned with either or both of these traditions.

Diener defined subjective well-being (SWB) as people's evaluations of their lives, which can both be affective and cognitive [9]. The affective component is commonly known as happiness, and the cognitive component is referred to as life satisfaction. It is also important to note positive and negative affect, as well as the cognitive component of well-being, are independent constructs [10]. The affective component, which is also referred to as hedonic balance, highlights the importance of the cumulative impact of both the presence of positive affect and the absence of negative affect. The cognitive component is typically operationalized as the degree of satisfaction with one's life in general and/or in relation to specific life domains, such as work, family, and health. Also, when contrasting emotional and cognitive well-being, affect is more responsive to short-term influences.

Gallup has defined well-being as an integration of evaluations (how one rates his or her life) and experiences (what one experiences in life) across five "essential elements" of living [11]. The five elements were identified based on an exploratory research process that included literature review, qualitative reviews, regression analyses to determine generalizability, and factor analyses to determine common dimensions. The elements include: (1) career (how one spends time during day), (2) social (quality of relationships), (3) financial (degree of financial security), (4) physical (ability to do what one wants free of distress and impairment), and (5) community (feeling safe and involved in community).

Ryff (1995) has promoted a cognitive and eudaemonic model called Psychological Well-Being (PWB). PWB includes six theoretically-derived self-evaluative themes: (1) autonomy (following personal convictions), (2) environmental mastery (ability to manage demands of daily life), (3) personal growth (talents and potential is realized over time), (4) positive relations with others (close and valued relations with others), (5) purpose in life (having goals that give life meaning and purpose), and (6) self-acceptance (awareness and acceptance of one's strengths and weaknesses) [12].

There is an ongoing scientific discussion about the degree and structure of the relationship between the hedonic and eudaemonic forms of well-being. For example, there is debate about whether the two concepts are not qualitatively distinct and that hedonic pleasure is a broader and more primary index of well-being, because it is the reinforcing aspect of eudaemonic and other types of behaviors [13]. Likewise, PWB has been proposed to be the individual characteristics that contribute to optimal SWB outcomes [14].

It is also key to note that there are other constructs that have significant conceptual and empirical overlap with well-being. One such construct is the well-researched construct of quality of life (QoL) [15]. The WHO provided the following definition of QoL: "An individual's perception of their position in life, in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards, and concerns. It is a broad ranging concept, affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, and their relationship to salient features of their environment" and later added a sixth domain on spirituality, religiousness, and personal beliefs [16].

Wellness is another construct that has been found to overlap highly with well-being [17]. This finding was based on a holistic wellness model that constitutes a whole person approach for "improving quality of life in proactive and positive ways" and includes the "interconnectedness of the characteristics of a healthy person" [18]. An updated version of this model includes four major life task areas based on confirmatory factor analyses of inventory items that measured the original five factor model. These four life tasks include the following: (1) cognitive-emotional wellness, (2) relational wellness, (3) physical wellness, and (4) spiritual wellness [19].

Although there is no consensus definition of well-being, it is important to be clear that well-being is not defined by the absence of illness. The constructs associated with well-being suggest that the individual is thriving rather than surviving. Well-being is experiencing happiness rather than experiencing depression [20]

2.2 Well-being Theories

The theories of well-being make explicit the assumptions about various mechanisms for how well-being is maintained, gained, and lost. These theories also provide the basis for both interventions to leverage our current understanding of well-being, along with research to advance our understanding. Three main themes in well-being theories are innate homeostatic mechanisms, inner drives, and cognitive processes. Set Point Theory and Adaptation Theory are example of homeostatic models. In contrast, Self-Determination Theory is a theory about internal drives and the Focusing Illusion describes the role of attentional biases.

The Set Point Theory proposes that adults have relatively stable levels of well-being that generally do not change except temporarily in the face of major life events. An important implication of this model is that a significant portion of person's level of well-being remains constant over time. However, evidence about exceptions to this theory suggest that it needs to be updated to reflect the range of circumstances when well-being in population sub-groups does involve significant and sustained changes in response to external circumstances (e.g., death of one's child, economic factors) [21].

The Adaption Theory is another homeostatic model that focuses on the role of affect and the tendency of organisms to habituate to most stimuli and return to a previous level of well-being. This theory has also been called the "Hedonic Treadmill" because it proposes that people are constantly engaged in a process of working for accomplishments and possessions that will make them feel happy, habituating to the new level, and then repeating the process to get to a new level that will make them happy [22]. Like Set Point Theory, the Adaptation Theory has been updated based on emerging empirical findings that revealed increased complexity of how well-being and adaptation processes can vary across individuals around the consistent theme of hedonic adaptation [23]. A key implication of adaptation is that there is a risk that repetition of behaviors can remove the potency of activities and, in order to sustain enhanced well-being through behaviors, it is important to vary activities to keep them interesting [24].

Self-determination Theory (SDT) provides an alternate explanation of well-being processes based on specific innate drives. SDT posits that there is a continuum of motivation and various psychological needs that, when satisfied, result in pleasant feelings and the ability to function at more optimal levels [25]. SDT proposes that three inherent human needs are central to motivation and well-being: (1) competence is defined as a drive towards mastery and control in one's environment and is facilitated with appropriate challenges and encouraging feedback, (2) relatedness describes a basic need for connection with others and is reinforced by friendly and caring interactions, and (3) autonomy describes an urge to act in accordance with one's own interests and values and is fostered by flexible and supportive relationships [26]. Similarly, autonomy is viewed as a moderator in a process in all acts of self-regulation, self-control, and choice, drawing upon a limited resource of self-regulatory strength and potentially resulting in a state of fatigue called ego-depletion, similar to the fatigue that results from over-using a muscle [27]. An implication is the importance of conserving the use of self-control and making choices, because one will be increasingly vulnerable to lapses in self-control and the attendant behavioral and social problems as these resources are depleted, which ultimately lead to decreased well-being.

Kahneman (1999) offers a theory of well-being and hedonics (what makes experiences and life pleasant or unpleasant) that focuses on the role of the cognitive processes of attention, biases, and decision-making [28]. A key construct is the focusing illusion, which is also known as affective forecasting. The Focusing Illusion refers to a tendency to over attribute overall happiness to one factor and overlook numerous other

factors that would in most cases have a greater impact [29]. An implication is that cognitive processes are an important mediator of well-being.

It is also important to note that there have also been many additional theories developed and tested around specific questions such as well-being's relationship with income levels, between nations, between genders, and across the lifespan. Each of these topic areas are covered by a literature base that can also inform an overall theory of well-being. However, a review of these areas is beyond the scope of this paper.

2.3 Well-being Measures

It is important to understand the measurement approaches in order to be able to evaluate the well-being literature and to identify the best options for measuring well-being in different contexts. Basic considerations include the methods, psychometric issues and content. In addition, large repeated samplings provide a unique vehicle for looking at relationships between variables across populations and across time.

The measurement methods typically take the form of surveys and experience sampling. Each method offers different advantages and disadvantages. The selection typically includes considerations about the type(s) of well-being being assessed and contextual factors, such as time and other resources available for data collection. The survey approach is a cost-effective method, especially when collecting information from a large sample of people. Also, even though the survey method is vulnerable to biases such as recall and interviewer-effects, there is evidence of acceptable test-retest reliability [30]. In contrast, the experience sampling method (ESM) involves prompting individuals to provide ratings at random intervals throughout the day by use of an electronic device worn by the individual. ESM provides a way to sample thoughts, feelings, and behaviors in everyday situations. This method is especially attractive for assessing affective states, because it minimizes the risk of memory distortion.

With all psychometric instruments, it is vital to determine the adequacy of reliability and validity indicators. This scope of this review is not able to include the psychometrics of each instrument. However, it is recommended that reliability of these types of population based measures be compared against standards for labor economics [31] and survey data [32]. Likewise, once evidence for adequate reliability is established, it is equally important to establish whether there is suitable validity. One method for establishing validity is through studies that provide evidence that self-ratings of SWB reflect real differences that are confirmed by reports by others and observed behavior [33].

The World Values Surveys (WVS) and European Values Surveys (EVS) also provide international-level data that includes a measure of happiness. Information about the WVS and EVS development and data is available on the Internet at the Inter-University Consortium for Political and Social Research website: <http://www.icpsr.umich.edu/icpsrweb/ICPSR/>. The WVS and EVS series were developed to support cross-national and cross-cultural comparison of values and norms on a wide variety of topics and to monitor changes in values and attitudes around the world. This data collection contains the survey data from the four waves of the WVS and EVS surveys, carried out in 1981-1984, 1990-1993, 1995-1997, and 1999-2004. These survey responses have now been integrated into one dataset, to facilitate time series analysis. The surveys provide data from representative national samples of populations from approximately 81 societies (covering 60 countries) that contain 85 percent of the world's population. The surveys also cover societies with a full range of variation in income (per capita incomes below 300 dollars per year to more than 35,000 dollars per year), government structures (from long-established democracies to authoritarian states), economies (from market economies to being in the process of emerging from state-run economies), and religious and cultural traditions (historically shaped by a wide variety of religious and cultural traditions, from Christian to Islamic to Confucian to Hindu), and cultural values emphasizing social conformity and group obligations to emphasizing human emancipation and self-expression). The categories of questions include perception of life, family, work, traditional values, personal finances,

religion and morals, the economy, politics and society, the environment, allocation of resources, contemporary social issues, national identity, and technology and its impact on society.

Gallup-Healthways is a commercial example of a well-being index that is used to track well-being and consumer outcomes internationally. The Gallup-Healthways Well-Being Index (WBI) includes six sub-indexes. The Life Evaluation Index is the prime index and includes evaluations of present and future lives on a scale with steps numbered from 0 to 10, where 0 is the worst possible life and 10 is the best possible life. The rating system divides responses into three categories: “thriving”, “struggling”, and “suffering”. A person who rates today a “7” or higher and the future an “8” or higher is classified as “thriving” and a person who rates today and the future a “4” or lower on the scale is categorized as “suffering”. The overall Life Evaluation Index score is calculated as the percentage of thriving Americans minus the percentage of struggling Americans. The other five indexes include: (1) Emotional Health Index (daily smiling or laughter, learning or doing something interesting, being treated with respect, enjoyment, happiness, worry, sadness, anger, stress, and diagnosis of depression), (2) Work Environment Index (job satisfaction, ability to use one's strengths at work, supervisor's treatment, and trusting work environment), (3) Physical Health Index (sick days in the past month, disease burden, health problems that get in the way of normal activities, obesity, feeling well-rested, and daily energy, colds/flu, and headaches), (4) Healthy Behavior Index (smoking, eating healthy, weekly consumption of fruits and vegetables, and weekly exercise frequency), (5) Basic Access Index (access to clean water, medicine, safe place to exercise, and affordable fruits and vegetables; enough money for food, shelter, healthcare; having health insurance, having a doctor, having visited a dentist recently; and satisfaction with the community, the community getting better as a place to live, and feeling safe walking alone at night) [11].

Other international examples are found specific to Europe and Australia. The European Personal and Social Well-Being Module is used to evaluate the success of European countries in promoting the personal and social well-being of their citizens. This inventory examines personal feelings (e.g., optimism, self-esteem), personal functioning (e.g., autonomy, competence, achievement); inter-personal feelings (e.g., community support; respectful treatment; social support); and inter-personal functioning (e.g., volunteering; caring for others; altruism) as well as health risk behaviors [34]. In contrast, the Personal Well-Being index is used in Australia to monitor national levels of well-being and contains eight items assessing satisfaction with different life domains such as the following: standard of living, health, achievement in life; relationships, community-connectedness, future security, and spirituality/religion [35].

In the U.S., the National Survey of Midlife Development in the United States (MIDUS), is a survey of adults aged 25-74 years that is designed to assess aging in relation to psychological experiences. MIDUS includes multiple components including both cross-sectional assessments of subgroups of respondents and longitudinal assessments. MIDUS includes questions on mental and emotional health, psychological factors, social networks and support, social participation and spirituality [36]. The MIDUS data has been used to validate Ryff and Keyes' operationalization of well-being and psychological well-being [Ryff, 1995]. In addition, the MIDUS survey has integrated innovative approaches such as daily diary studies, cognitive assessments and biomarkers [37].

The Centers for Disease Control and Prevention (CDC) in the U.S. have also tracked population-level measures of well-being and related constructs on its national and state surveillance systems, yielding large samples of representative population data. For example, the Behavioral Risk Factor Surveillance System (BRFSS), the largest telephone survey tracking health conditions and risk behaviors monthly in all 50 states, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam since 1984 (<http://www.cdc.gov/brfss>), includes questions on life satisfaction and satisfaction with social and emotional support. Data from the 2005 BRFSS found that 5.6% of U.S. adults (about 12 million) reported that they were dissatisfied/very dissatisfied with their lives [38] and that 8.6% of adults reported that they rarely/never received social and emotional support; ranging in value from 4.2% in Minnesota to 12.4% in

the U.S. Virgin Islands [39]. The National Health and Nutrition Examination Survey (NHANES) has included the General Well-Being Schedule as far back as 1971 [40]. And the National Health Interview Survey (NHIS) has included the Quality of Well-Being Scale that assesses global life satisfaction; satisfaction with emotional and social support; and feeling happy in the past 30 days [41]. CDC has also recently begun to explore an expanded set of well-being measures for use on public health surveillance systems [42].

3.0 HOW DOES WELL-BEING RELATE TO SUICIDE PREVENTION, RESILIENCE, AND OTHER READINESS OUTCOMES?

The DoD SPTF identified well-being as a key outcome associated with goals of improved suicide prevention and resilience building as a key component of the overall suicide prevention effort [6]. In addition, the DoD Mental Health Task Force, which was tasked to make assessments and recommendations for improving the efficacy of mental health services provided to service members by DoD, emphasized the importance of an enhanced focus on suicide prevention and resilience building [43]. As part of DoD's response, the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCoE) created a Resilience and Prevention directorate, which was partly based on a belief about an inherent connection between resilience and prevention. The DCoE view is that resilience and suicide prevention represent health promotion and prevention efforts at two different ends of a common continuum of stress and resilience. This continuum model will be reviewed later in this paper.

This section summarizes readiness-related findings from research with both the military and general population. A common theme is that there is limited well-being research with military-specific populations and a more robust literature base with the general population. Therefore, the military may be able to benefit by being aware of the findings from research with the general population.

3.1 Suicide Prevention

The literature about suicide risk and prevention has primarily focused on risk factors and seeking to delineate the multitude of varying relationships between risk factors and suicide outcomes. Although there is limited research that looks at both well-being and suicide with military populations, there are studies from the general population that can offer evidence that is potentially generalizable to some military populations. This review will look at the evidence for a relationship between well-being and suicide completions as well as suicide risk factors.

There are several lines of research with healthy populations that support a direct relationship between well-being and risk for suicide. First, studies suggest that individuals who are more resilient or experience significant well-being are less likely to experience suicidal ideation or suicidality [44, 45, 46]. Second, an analysis of WVS national-level data from 117 country waves from 50 countries over two decades found a negative relationship between suicide and life satisfaction as well as social capital, a correlate of well-being [47]. Likewise, another analysis of WVS data from 97 countries found that happiness was associated with lower suicide rates but suicide rates were not reliably related to countries' unhappiness and life-satisfaction indices [48]. Lastly, in longitudinal studies with healthy Finnish adults, life dissatisfaction was associated with people who had developed or would develop depressive symptoms [49] and predicted suicide completions [50].

In addition, there are studies with at-risk populations that are worth considering given the limited military-specific research on well-being and suicide risk. Although these populations have limited shared characteristics with military personnel, it may be possible to explore generalizability from the identified populations to military populations. Many military members may share a common at-risk status due to exposure to battlefield stressors. These studies have been notable in Australia, Europe and in isolated

populations such as Arctic indigenous peoples and Aborigines, and their findings converge around a theme of diminished well-being and increased negative health outcomes including suicide [44, 51, 46].

There is evidence that low levels of well-being may be both directly and indirectly related to hopelessness. A study with patients admitted to a medical center in Rome for chronic headaches suggested that factors related to well-being were implicit in suicide risk. Specifically, high rates of depression and hopelessness were associated with reduced quality of life and risk for suicide [Defilippis, 2008]. In a separate study with health care personnel, burnout (a common phenomenon in health care personnel characterized by reduced effort and lack of empathy) was associated with hopelessness, which was associated with suicide risk [52]. The phenomenon of burnout is relevant to military populations. Studies have found that burnout amongst uniformed nurses was a significant problem compared to their civilian counterparts in military treatment facilities [53]. Burnout is a phenomenon that may occur following long-term exposure to stressful demands. This study reported that uniformed nurses were exposed to significant stressors that differed from their civilian counterparts. The differences between civilian and uniformed medical staff included that civilian providers were able to remove themselves from stressful situations by resigning their position, an option which was not available to uniformed staff.

Social support variables can be both risk and protective factors for well-being and suicide. Research with adolescents indicates poor social support in the form of perceived lack of acceptance and isolation increases the risk of self-injurious behaviors [54, 55]. Divorce rates, a distinct form of disrupted social support, has also been found to be associated with suicide rates when looking at national level data from the WVS [47]. In contrast, in the same study with WVS data, social capital (strength of relationships in family and community) was found to be a protective factor associated with improved life satisfaction and reduced suicide rates.

Likewise, risky behaviors have been frequently associated with suicide and other adverse events in the general population and in the US military. A study that surveyed a sample of 9,515 students from 30 US colleges and universities (comparable age group to the largest demographics in the military) found that well-being was negatively related to the frequency of various forms of alcohol-related health risk behaviors (e.g., sex while drunk or high, drunk/drugged driving, and riding with an impaired driver) [56]. Likewise, the Army Suicide Prevention Task Force report noted an increased level of high risk behaviors in the US Army, proposed that military service may actually attract people who are pre-disposed to risky behavior, and advocated the importance of garrison leadership in managing this threat to well-being [57]. In addition, others have noted both the significant size of the at-risk demographic population (young adult males) and increases in health risk behaviors in military personnel as justification for increased health risk behavior screening [58].

3.2 Resilience

The current theories and evidence suggests that there is a dynamic interaction between well-being and resilience in which well-being can facilitate resilience outcomes and resilience can contribute to enhanced well-being. However, the evidence for this relationship is newly emerging, limited, and presents a number of challenges related to the variety of definitions, theories, and measures for both constructs. This construct heterogeneity can be simplified with a two caveats. First, the various findings from well-being research can be sorted according to two definitions of wellbeing: SWB (hedonic outcomes including positive and negative emotions) and PWB (eudaimonic outcomes such as realizing one's talents and life satisfaction). Second, this paper conceptualizes resilience as the combination of two themes that are common to most definitions of resilience: being exposed to adversity and adapting effectively, which is typically operationalized as exhibiting reduced adverse mental health outcomes in comparison with others exposed to the same adversity or maintaining/returning to previous levels of functioning. This paper also advocates the perspective that well-being provides additional insight into resilience dynamics, because well-being measures positive dimensions of health (e.g., happiness, satisfaction, meaning, and self-

realization) that go beyond the common resilience metrics representing the absence of distress and dysphoria [59].

There is evidence that well-being can facilitate outcomes associated with psychological resilience. For example, research with two longitudinal cohorts representing young and middle adults from Australia found evidence that SWB, in the form of increasing positive affect and decreasing negative affect, mediates PWB's effects on depression and anxiety [60]. This conclusion is also supported by research based on the broaden-and-build theory of positive emotions, that provided evidence that positive emotions (SWB) broaden people's repertoire of thoughts and actions and enhances their coping skills and resilience [61].

Study findings also indicate that well-being is associated with resilient outcomes related to organizational and physical functioning. One study found that mental health, defined as flourishing and being without a mental health diagnosis, is associated with reported work functioning (e.g., fewest missed days of work), psychosocial functioning (e.g., clear goals, high resilience, high intimacy, and low helplessness), and health (e.g., lowest risk of cardiovascular disease, lowest number of chronic physical diseases with age, fewest health-related limitations in daily activities, and lower health care utilization) [62]. In addition, a study with a MIDUS national sample of ageing women and biological markers found that eudaimonic (PWB) was associated with improved physiological indicators of resilience (e.g., salivary cortisol, pro-inflammatory cytokines, cardiovascular risk, and quality of sleep) [63].

Resilience has also been found to be a predictor of subjective well-being. In a series of studies with samples in later adulthood, the trait of psychological resilience predicted a weaker association between positive and negative emotions, particularly on days characterized by heightened stress [64]. In addition, the experience of positive emotions also appeared to help resilient individuals in their ability to recover effectively from daily stress.

There is also evidence that there is that resilience and well-being can be co-occurring outcomes. For example, an internet survey study with a convenience sample after September 11, 2001 terrorist attack found that changes in world views and the quality of personal relationships predicted both resilience in the form of mental health outcomes and well-being [59]. In addition, a case study comparing the impacts of salutogenic (focusing on aspects of positive health) and more illness-focused traditional screening interviews with Navy submariners found that the salutogenic interviews were followed by less supervisor and self post-assessment referrals for psychological services [20].

3.4 Methodological Concerns

There are multiple methodological concerns about making generalizations from this data. Each of these concerns also constitutes a potential focus area for better understanding and leveraging well-being in the military. First, the limited standardization across terminology, definitions and measures limits the ability to directly compare and integrate findings. Second, the majority of studies are correlational in nature and lack adequate control groups and randomized selection. This limits conclusions about directionality and internal validity of findings. Third, there is limited literature identifying the relationship of well-being with suicide risk and with resilience. Fourth, there are no well-being interventions identified in the context of suicide prevention and resilience. Therefore, it is difficult to assess well-being's potential role as a mediator in these areas and potential well-being mechanisms in general. Fifth, there are few studies on military populations so there is no direct evidence about the role and impact of well-being in the military culture. This concern is further compounded by the challenge of understanding how well-being may have different roles and impacts across the many military sub-populations. Sixth, studies may have benefited from increased specificity about the theoretical and empirical basis for experimental hypotheses and presumed mechanisms of action. Finally, the orientation of many studies is from an illness perspective,

lacking adequate representation of a strengths-based perspective that would focus more on resilience and protective factors. This is a critical shift that will better enable the military to proactively assess, strengthen and empower the population.

Potential areas for future study include the following: (1) develop consensus-based standardized definitions and measures; (2) pilot studies with US military personnel; (3) development of theoretical models which identify well-being and establish potential relationships between experiencing well-being and thriving specific to military occupations; (4) designing intervention-based studies to enhance well-being; and (5) establishing study models which account for the high risk associated with studying suicidal individuals. Designing and completing these studies may provide evidence for use of well-being as a risk reducing/health promoting construct for military personnel.

4.0 WHAT FACTORS CONTRIBUTE TO WELL-BEING?

Well-being is influenced by a range of factors, which are critical for predicting and enhancing well-being. Lyubomirsky and colleagues (2005) identify three general categories of contributing factors (genetic set point, intentional activity, and circumstances) and suggest that a breakdown of their relative contributions to well-being is roughly 50%, 40%, and 10% respectively [24]. These authors also identified a number of evidence-based principles for enhancing well-being that include increasing intrinsic motivation, countering hedonic habituation, and conserving a person's limited capacity for self-regulation.

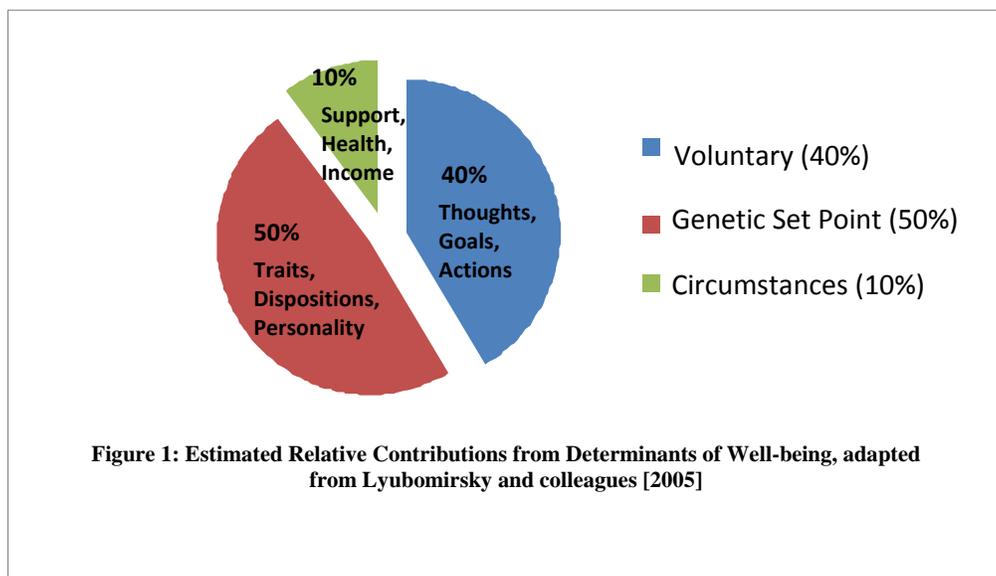


Figure 1: Estimated Relative Contributions from Determinants of Well-being, adapted from Lyubomirsky and colleagues [2005]

There are implications associated with the estimated relative distribution of the contributing factors. One implication is that a person can influence up to 40% of the well-being variance through intentional activities and these behaviors can be learned with appropriate education and training [65]. Second, 10% of the variance can be impacted by environmental factors, many of which are associated with the military for military members. Finally, approximately half of the variance remains fairly stable, which is important to account for because it is a steady and significant influence. This paper will focus on contributing factors that fall in the intentional activities and environmental categories, both of which military leaders can influence in support of service members.

Resilience, well-being and suicide prevention appear to share many protective factors. For example, in a review of protective factors contributing to military suicide prevention, Jones and colleagues identified the

following variables: (1) social support; (2) sense of belonging; (3) having leadership responsibilities; (4) coping skills; and (5) problem solving capability. Additionally, (1) having been exposed to a culture that encourages help seeking; (2) unit cohesion; (3) camaraderie; (4) access to health resources, (5) a healthy lifestyle; and (6) spiritual support were associated with a diminished risk for suicide.

Furthermore, the well-being literature has identified the influence of societal moderators, such as tolerance, diversity and cultural variables [66], which fall in the category of circumstances. Likewise, military populations have their own internal cultural differences associated with services and components, specialities (e.g., line, first responders, providers), ranks (enlisted, officer), operational settings (in garrison and deployed), age and gender (the military is mostly young male however it is also important to pay attention to the female minority), family members (spouses and children), and transitional status of service members (e.g., returning from deployment, recovering from injury, and/or transitioning to civilian society). Since it is impossible to overview findings related to all of these sub-groups, this paper is intentionally focusing on findings most relevant to the well-being of the average healthy service member and military family.

4.1 Intentional Activities

There is evidence that a number of intentional mental and self care activities are associated with well-being. The mental activities can also be conceptualized as intrapersonal and interpersonal psychological skills that can be developed with education and training.

The intrapersonal mental activities that are associated with well-being include reframing cognitions and learned optimism [67,68]; setting and achieving personal goals [69]; identifying and using character strengths [70,71]; and gratitude (studies show that writing down a few good things that happened today and reflecting on one's role in them increases well-being and decreases depression) [72,73].

This paper has previously provided evidence for different ways constructive social relationships can be protective. The well-being literature also suggests that there are specific interpersonal activities that can enhance well-being such as active and constructive responding to capitalize on positive events reported by others by listening and inviting them to share more [74]. In addition, there is evidence that giving and doing volunteer work leads to increased well-being [75]. These interpersonal aspects of well-being have particular relevance to a variety of potential roles in the military community such as leaders and peers who offer support.

Finally, there is evidence that standard self-care activities play an important role in well-being. Although the value of self-care activities and primary prevention is generally recognized, there is mixed adherence with recommended levels of these activities. It may be helpful to know what the research says in relation to two important areas: physical activity and sleep. Regular physical activity is associated with greater well-being and less depression and anxiety across all age groups [76]. In addition, optimal sleepers (defined as sleeping between 6 and 8.5 hours per night on average) reported less depressive symptoms and reported more positive relations with others, purpose in life, and self-acceptance than non-optimal sleepers (those who sleep an average of either less than six hours or more than 8.5 hours), even after people with mild and moderate depressive symptoms were eliminated from the database [77].

4.2 Circumstances

Circumstantial factors are relatively stable current environmental and historical factors in a person's life. These factors include national, geographic, cultural, and demographic and status variables (e.g., age, gender, ethnicity, marital status, occupation, religious affiliation, and health), as well as historical events, such as significant emotional events and formal and informal educational experiences. Three prominent

areas include income and employment status, health status and social factors.

Studies provide evidence that well-being is positively associated with income levels [78], but beyond certain income thresholds associated with meeting basic needs, the association weakens in comparison with other non-economic aspects of life [79]. In contrast, unemployment has a fairly robust negative relationship with well-being [80], which may be an important consideration for military personnel who are returning without a job to civilian society. An important general consideration is that people tend to hedonically adapt to new circumstances, which is posited as a potential explanation for the reason that circumstances such as income levels explain a small portion of the variance in well-being.

Physical and mental health factors also relate to well-being. Studies indicate that well-being is directly related to physical health status [81] and negatively associated with disability [82]. Well-being has also been found to be negatively associated with mental health disorders with independent relationships to factors amenable to treatment, such as problem solving ability and social support. [83]. In addition, there is also evidence during two years of follow up, that patients with depression have equivalent or worse degradations in well-being in comparison with patients with chronic general medical illnesses [84].

There are a variety of social factors that have been found to be related to well-being. There is evidence that being married leads to more happiness than being single, divorced, or widowed [85]. In contrast, on a broader social level, social capital, which is characterized as the strength of family, neighborhood, religious, and community ties, has been found to be related to subjective well-being [86]. In a study using Gallup data from Canadian samples, trust (general trust and trust in coworkers, neighbors, and police) was found to be related to well-being [87], which would be categorized as an intentional activity that is theoretically related to environmental factors. When looking at the overlap of well-being and resilience as an absence of mental disorders, primary social networks (defined as number of close relatives and friends) of three or less people have been found to predict mental health disorders even after controlling for previous mental health disorders [88].

4.3 Principles for Enhancing Well-being

There are a number of empirically-validated principles for enhancing well-being that have been derived from the well-being theories described earlier in this paper:

1. Counter hedonic habituation by varying timing and context, avoiding routinized activities, using intentional attention and practice to keep experiences fresh, and ensuring enough time to reset after refractory period [3].
2. Protected limited capacity of self-control muscle by strategically pacing use of self-control [89 and limiting choices [90].
3. Leverage intrinsic motivation by matching people internal and external resources [91] and providing/supporting autonomy [92].

5.0 HOW CAN MILITARY LEADERS SUPPORT WELL-BEING?

A critical and practical end goal is to communicate the value of well-being clearly and simply to military leaders and give them tools they can use. These tools include resources and behavioral options for enhancing the well-being of service members.

5.1 Leader Tools

The US military has developed several tools that are based on a holistic and positive view of health. These tools include the Total Force Fitness model, Military-Demand Resources Model of psychological fitness, and the Stress Continuum. These tools are intended to provide leaders, program managers, providers, service members, family members, and veterans with a common framework for understanding and

facilitating well-being.

5.1.1 Total Force Fitness (TFF)

Recently, the Chairman of the Joint Chiefs of Staff in the US military has encouraged a major paradigm shift toward a multi-dimensional and holistic understanding of and support for resilience and well-being across the Total Force to include uniformed, civilian, and family members [93]. In support, a group of experts from across the US military services developed a model of Total Force Fitness (TFF). The TFF model was designed to be both comprehensive and inclusive across all services and all members of the Total Force so that it could be used as an initial enterprise-wide common framework. TFF is defined as “the state in which the individual service member, family and organization can sustain optimal well-being and performance under all conditions. It encompasses the whole person and is not merely the absence of disease or infirmity” [94]. TFF advocates an integrated approach to fitness and readiness across all key domains of military life, which include four mind domains (spiritual, psychological, behavioral, and social) and four body domains (physical, nutritional, medical, and environmental). TFF is seen as essential in helping the Total Force to maintain optimal levels of health and readiness, and capability to meet the increased demands of today’s challenges. TFF is intended to be the basis for a new paradigm and cultural shift toward a holistic view of health and fitness that includes both mind and body in the military. As such, although TFF is not a program, it will require guidance and assessment tools for commanders, education and training for leaders, and program development and evaluation.

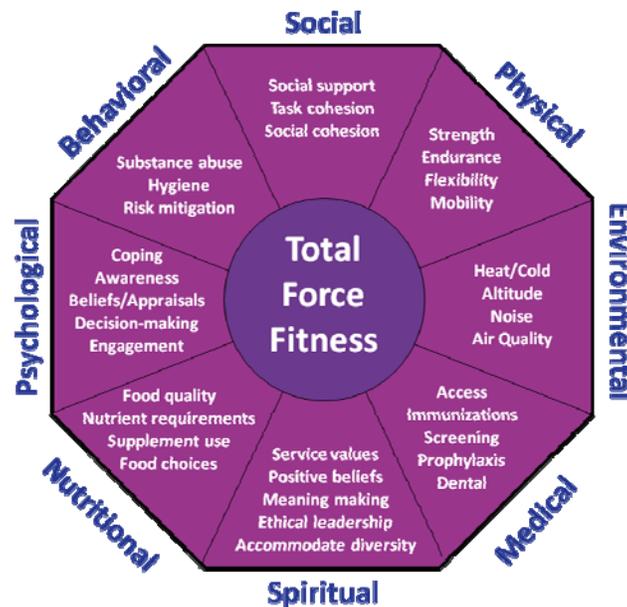


Figure 2: Total Force Fitness Model adopted from Jonas, 2010 [9]

A major step in the formal development of TFF is a series of papers in the August 2010 Supplement to Military Medicine, volume 175, issue number 8. The papers were dedicated to describing the overall TFF model and each of the eight mind-body TFF domains, including sub-domains, and potential metrics. For example, psychological fitness is defined as a combination of factors that enhance resilience (ability to withstand, recover, grow, and adapt under challenging situations) and/or performance (ability to successfully complete tasks) and includes five fundamental skill domains: attention and awareness, beliefs and appraisals, coping, decision-making, and engagement that we believe are essential skills for personnel in military operations [95]. Attention and awareness is the ability to notice internal changes as well as things in the environment that warrant attention and screen out things that are irrelevant. These skills are

the gateway to effective responding because a person has to first notice something in order to respond effectively. This is especially crucial on the battle field where the timely identification of small details can mean life and death. After awareness of internal and external events, the next conscious step involves appraisals and the underlying beliefs that influence the appraisals. Basic appraisals include judgments about “friend or foe” and “threatening or non-threatening”. Coping skills are identified as the third critical domain that is the response in an operational setting and are defined as ways for managing the demands of stress and maintaining optimal levels of energy and capacity to work. Coping activities include problem-focused coping, emotion-focused coping, “recharging” practices both tactically (e.g., relaxation and energization) and strategically (e.g., taking extended breaks from work such as a vacation), and cognitive load management. The decision-making domain can be conceptualized as a type of coping skill, but can also be seen as an instrumental skill for achieving goals beyond coping. Decision-making reflects how a person makes choices about how to respond to challenges and to conduct oneself in the difficult rules of engagement in war. Decision-making practices are generally categorized as linear (e.g., problem-solving steps) and non-linear (e.g., intuition and creativity). Finally, engagement can be thought of as a person’s level of intellectual and emotional connection with the unit. Engagement is seen as a vital component of functioning and performance in work contexts.

5.1.2 Military Demand Resource (MDR) Model

The MDR model was first proposed in the TFF paper on psychological fitness. This framework is meant to be a heuristic tool for all levels of the Total Force to better understand and assess the dynamic balance across system demands, internal resources, and external resources that lead to functional outcomes on individual, group and population levels.

This framework is based on an integration of two previous models that have been the basis for different lines of systematic research. The Conservation of Resources model has explored a wide range of community and organizational responses to stressors based on the premises that individuals are primarily concerned with acquiring and maintaining resources, and stressors become problematic only when there is an associated loss of resources [96]. The Job Demands-Resources model looks at organizational dynamics leading to employee performance and well-being outcomes [97].

The MDR model of psychological fitness emphasizes a systems perspective of the interaction between demands, internal resources, and external resources on individual, group, and enterprise levels. Key considerations include: (1) paying attention to the overall balance across resources and demands, (2) being vigilant for exhaustion of resources without adequate replenishment, (3) looking for ways to increase resources as a protective factor. This perspective implies that any person or group can break with enough acute and sustained demands. In addition, in times of high sustained demands and limited resources, it is essential to help people manage demands, prioritize mission requirements and identify ways to streamline, delay, or eliminate low priority tasks.

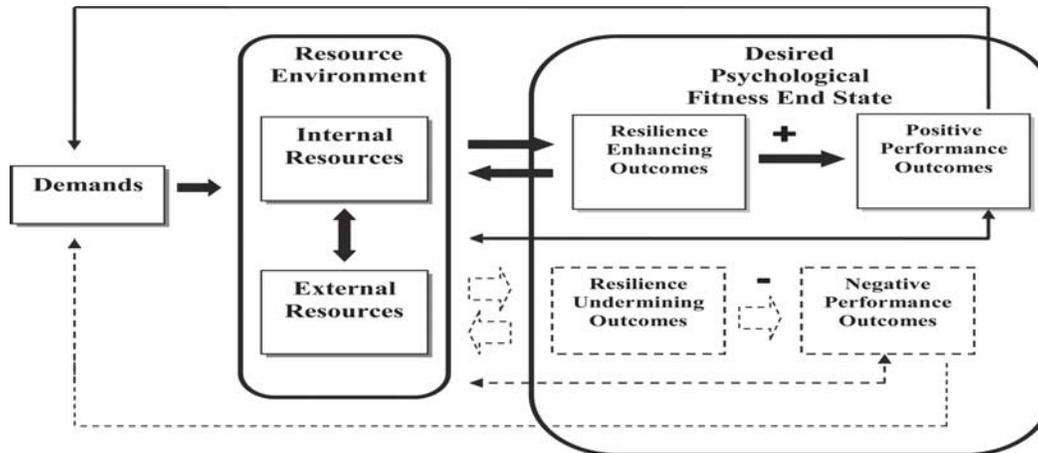


Figure 3: Military Demand-Resource (MDR) Model adapted from Bates, et al. 2010 [95]

5.1.3 Stress Continuum Model

The Stress Continuum model, which was originally developed by the US Marine Corps as a tool for leaders [98], was later adopted by DCoE as an important educational tool about operational stress for the military community. This model describes a continuum of stress responses that are color-coded as green (Mission Ready), yellow (Reacting), orange (Injured), and red (Ill). The stress continuum emphasizes the importance of shifting psychological health to the “green”, which involves (1) reinforcing that psychological health and fitness is just as important as physical health, (2) empowering leaders and front line support agencies to actively support and develop resilience-building measures, (3) supporting a unified effort to “push to the left” across the stages of optimal, reacting, injured, ill and supporting resilience in every stage of this effort, (4) recognizing that warriors and unit leaders (with support from medical) have the greatest involvement in achieving the optimizing mission ready state and maintaining this state when faced with challenges and stressors, developing strategies that allow individuals and units to return to mission ready state if they begin to react, (5) expecting that the responsibility and involvement of medical personnel increases as service members shift to the right of a mission ready state, and (6) understanding that recovery (shifting back to the mission ready state) is facilitated, encouraged, and promoted from every point on the continuum. The stress continuum is also conceptualized as an important anti-stigma measure because it de-medicalizes and normalizes operational stress injuries. It also recognizes that the normal course for stress injuries is to heal over time as well for stress illness, especially if properly treated.

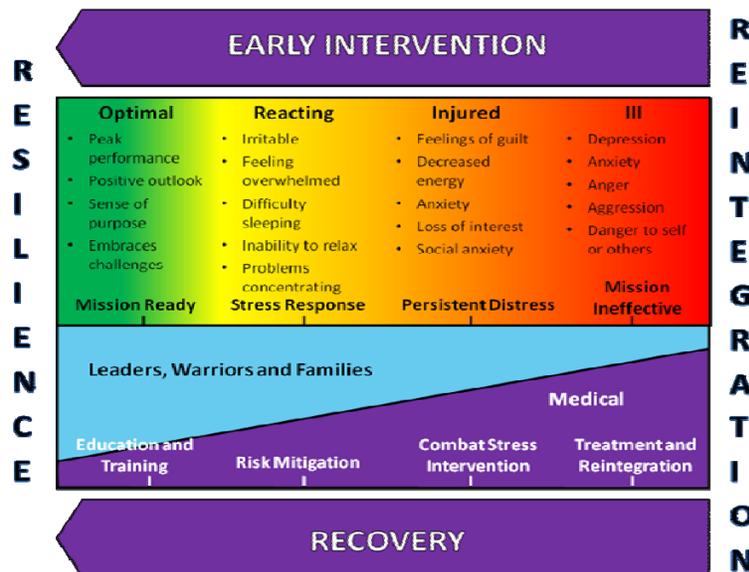


Figure 4: DCoE Stress Continuum

In addition to being primarily a heuristic tool for all members of the military force, there is also corollary evidence about the relationships across psychological symptoms on the stress continuum model and recognition of the need to use research to advance our understanding of this continuum as it applies to operational stress. For example, there is recognition that subthreshold symptoms of PTSD are as common as full PTSD and these subthreshold symptoms may represent either prodromal or residual symptoms of full PTSD [99]. In addition, studies have shown that sub-threshold symptoms are a risk factor for future depression and suicidal tendencies [100]. However, there is also evidence from structural equation modelling of discontinuities across this continuum in which psychological health, distress, and disorder are both correlated and conceptually distinct phenomenon [101]. A DCoE workgroup has also developed a framework of common data elements to support using research and continuing to evolve the stress continuum model in the context of combat and operational stress [102].

The Stress Continuum model was later adapted for the context of TFF. The primary changes included adding a fifth purple-colored region on the continuum to the “far left” representing thriving and flourishing and adding a brown vertical line on the continuum that represents the fit/unfit cut off and the traditional illness focus. These modifications are designed to emphasize: (1) a shift in focus from illness to optimal functioning and well-being, (2) a goal of developing a reservoir of internal resources and capacities that go beyond just being minimally fit and will hopefully make people more resilient with increased demands, and (3) a recognition that resilience is a process that is important across all parts of the stress continuum. The TFF adaptation of the Stress Continuum model is also consistent with Keyes’ proposal for a continuum of well-being that ranges from flourishing (positive feelings and functioning) to languishing (negative feelings and functioning) and a national mental health strategy that aims to increase the percent of people who fall in the flourishing category [103].



Figure 5: TFF Stress Continuum adapted from Bates, 2009 [104]

5.2 Leader Options for Supporting and Promoting Well-being in Unit Members

The stark reality is that the best knowledge about psychological health will be of little use unless successfully translated into a format that the operational military can understand and use. Also, the military line leaders are the best promoters of psychological health due to their authority, experience with operations and units, and regular opportunities for interacting with the service members who could most benefit from this knowledge. As already recognized by US service programs, the leadership is the rightful owner of resilience and operational stress programs; the proper role for support agencies is to support the leaders. Additionally, leaders can influence their units in many ways, including using their own actions to model healthy behaviors, developing and reinforcing healthy behaviors in others, and discouraging unhealthy behaviors.

Based on this review of well-being, resilience, and suicide prevention, below are some specific options leaders can use to enhance well-being in their unit members with references to the related well-being constructs in parentheses. Most, if not all, of these activities are already well known to military leaders. However, the list may serve as a helpful reminder, and the connections made with well-being may help enhance how leaders promote these activities.

1. Model that well-being is more about one's state of mind than about external circumstances (role of intentional activities).
2. Align unit members with activities that are meaningful to them; consider using a strengths-based inventory to identify and leverage unique strengths of unit members (intrinsic motivation).
3. Give unit members the freedom to determine how to do tasks; minimize oversight as much is realistic for the activity, context, and person (autonomy).
4. Create opportunities for unit members to do pleasant activities together and to connect socially; encourage supervisors to create safe mentor relationships with subordinates; and promote teamwork and buddy systems (need for relatedness and value of social support).
5. Support unit members in developing and maintaining close relationships outside of work, especially with their own families (need for relatedness and value of social support).
6. Minimize unnecessary choices, simplify, regulate exposure to situations that require high self control, and be extra vigilant on potential risks of acting out after extended situations that did require

- significant amounts of self-control; only take time to choose carefully when the decision is important (self-control as a limited resource and risk of ego depletion).
7. Celebrate and savor wins, look for and recognize successes, take time to listen, and show genuine interest when people are successful (capitalize on positive events using active-constructive responses).
 8. Encourage gratitude by asking people what they are grateful for today, reasons for being thankful, and about their role in that event (gratitude).
 9. Find ways to create variety in activities; give enough time for a refractory and reset period (prevent/minimize hedonic adaptation).
 10. Find ways to help others (altruism).
 11. Create opportunities that will yield lasting meaning as opposed to quick fixes that leave a person feeling more empty (positive emotions “broaden and build” one’s capacity for enjoying life and being productive).
 12. Prioritize getting regular physical activity and healthy sleep (self-care activities).

6.0 CONCLUSION

There is a general recognition that well-being is a key indicator of overall health; a range of evidence shows that well-being is associated with many readiness-related outcomes. In addition, the well-being literature provides data supporting ways to enhance well-being. This evidence includes a range of studies with international and national samples, using cross-sectional and longitudinal designs. It is important to note that the majority of this evidence is from studies with samples from the general population. The hope is that the promising findings with the general population are generalizable to military populations. However, there is limited evidence-based research about the role of well-being in the military in general and with respect to important sub-groups like wounded service members and family members. This gap constitutes a challenge and an opportunity for enhancing the military’s public health approach to promote psychological fitness and resilience and prevent suicide.

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