

Military Health and Social Determinants of Health: A Scoping-Systematic Review

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Abstract

Background: The military faces significant physical and mental health challenges, including PTSD and depression. Addressing and preventing chronic diseases in the armed forces is crucial for national security, and Social Determinants of Health (SDH) play a significant role in military health outcomes. Conducting a comprehensive literature review of the social elements that influence military health can aid in creating policies and improving the well-being of service

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members and veterans. **Methods:** This systematic review searched multiple databases using specific keywords to identify studies published within the last ten years investigating SDH in military communities. Data extraction involved identifying eligible research, extracting data using a standard form, and synthesizing the data using a narrative technique presented clearly and comprehensively with tables and figures summarizing the key findings. **Result:** At least thirteen factors affect SDH in the military. Economic variables, such as military rank-based income and housing, are the most influential. Understanding and addressing these SDH factors is crucial for ensuring the well-being of military personnel and promoting overall societal health. Intersectoral collaboration is also necessary for success in these areas. **Conclusion:** SDH significantly impacts the well-being of military personnel, with economic variables being the most influential factor. Addressing these determinants using intersectoral collaboration and advocacy efforts should be a top priority for military organizations to ensure their personnel's health and overall societal health. **Keywords:** Military; Social Determinants of Health; Systematic Review; Health Equity; Strategies

Introduction

The armed forces play a vital role in safeguarding a country's security and protecting its strategic concerns. Individuals serving in the armed forces often face perilous circumstances and must make significant personal sacrifices to fulfill their duty to their country [1]. The military profession entails substantial challenges and personal trade-offs. The prolonged periods of separation from family and loved ones that service personnel face may lead to the development of physical and mental health challenges [2].

Service members' and veterans' physical and mental health can be affected by various factors, such as life-threatening injuries, mental health concerns, and exposure to environmental hazards [3]. Studies have indicated that military personnel are susceptible to a range of mental health conditions, including post-traumatic stress disorder (PTSD), depression, acute stress disorder, and traumatic brain injury (TBI) [4]. The conditions above can be triggered by either direct or indirect involvement in armed conflict, deployment, or general military duty. The symptoms above have the potential to persist for a prolonged period of time following the traumatic incident and may impede routine functioning [5].

Furthermore, empirical evidence indicates that a subset of roughly 14-16% of American military personnel who were deployed to Afghanistan and Iraq exhibit symptoms of PTSD or depression [4,6]. Moreover, individuals who engage in military service are vulnerable to developing traumatic brain injury, substance misuse, and aggressive conduct [4]. It is also noteworthy that over 3.6 million military personnel experienced musculoskeletal injuries between 2008-2017. The rising incidence of obesity in military personnel, projected to escalate from 16% in 2015 to 19% by 2020, calls for attention [7]. The incidence of sexual assault in the military is noteworthy, as evidenced by a mean frequency rate of 3.9% for male veterans and 38.4% for female veterans [8].

The importance of physical fitness and well-being in the military requires the consideration and mitigation of chronic illnesses as a matter of national security. The Military Health System (MHS) is instrumental in promoting healthy behaviors and preventing chronic diseases among service members. This is achieved through various initiatives, including active duty health and smoking cessation programs [7]. The MHS prioritizes the health and well-being of military personnel to ensure the readiness and capability of the nation's armed forces and to address any potential challenges (Health.mil, 2022) effectively.

Acknowledging the commitment and selflessness exhibited by individuals in the military is imperative, and providing them with

adequate resources to preserve their physical and mental well-being is also crucial. Veterans are provided with various resources, such as mental health treatment, physical therapy, and other forms of assistance to aid them in managing their health and transitioning to civilian life post-military service [9]. Optimizing social determinants of health (SDH) facilitates the comprehensive utilization of these resources [10].

The Social Determinants of Health (SDH) framework looks at the plausible influence of non-medical factors on an individual's health results. The critical components of the SDH framework consist of economic stability, educational quality and availability, health-care quality and accessibility, environmental conditions, built environment, and social as well as community context [11]. According to the World Health Organization [12], understanding and resolving the SDH can enhance health outcomes and mitigate health inequalities across various populations.

The research findings indicate that SDH significantly impact the well-being of military personnel, particularly in the domains of mental health and trauma. Kintzle et al. (2018) conducted a study to examine the impact of war exposure, dishonorable discharge, and social connection on symptoms of PTSD [13]. Another study by Menschner & Maul (2016) investigates the efficacy of trauma-informed treatment methods for individuals who have experienced trauma [14]. The aforementioned discoveries could hold particular significance for military personnel and veterans subjected to combat and other traumatic experiences. Furthermore, a study conducted by Oral et al. (2016) scrutinizes the impacts of premature hardship and traumatic stress on both somatic and psychological well-being [15].

By contrast, the current corpus of scholarly inquiry has yet to thoroughly assess the societal factors that impact the well-being of military service members. A preliminary examination of the literature may have resulted in restricted findings pertaining to enhancing military health and diminishing military strength. Yet, that is only a theory. The scoping-systematic review process can yield several advantages, such as facilitating the identification of social determinants of military health, supporting the

development of policies and practices pertaining to military health, and assisting in identifying areas for further research. The purpose of this study was to conduct a comprehensive analysis of the social factors that impact military health by synthesizing and evaluating prior research findings.

Methods

Search Strategy

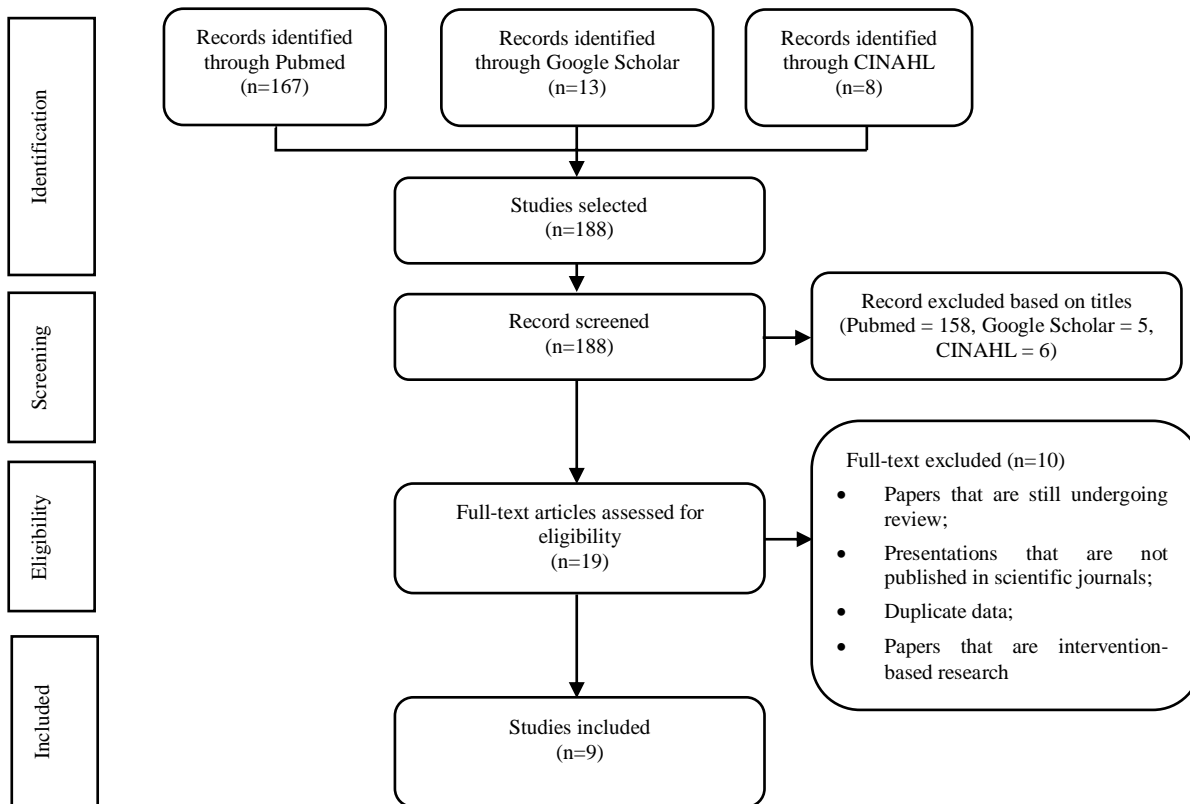
The scoping-systematic review was executed in accordance with a predetermined protocol and entailed an exhaustive exploration of various databases, such as PubMed, Google Scholar, and CINAHL. The inclusion criteria for this study comprise three aspects: (1) the studies must have been published within the past decade (2013-2023); (2) they must pertain to social determinants of health (SDH) and military health; and (3) they must exclusively employ publications

in the English language. Furthermore, the study incorporated exclusion criteria not considered during the analysis. The following categories of research output are excluded from consideration: (1) manuscripts that are currently in the peer-review process; (2) conference presentations that have not undergone publication in scholarly journals; (3) replicated data; and (4) research papers that are based on intervention studies.

Study Selection

The search query comprised a set of military health and social determinants of health (SDH)-related keywords in various combinations. The titles and abstracts of all the identified papers were examined for relevance to the research questions of the review by two independent reviewers. Following the initial screening process, the reviewers analyzed the complete texts of all pertinent articles.

Fig 1. Flow diagram of literature search by database



In order to address any discrepancies - and ways of managing them - among reviewers, a common discourse shared understanding were established. Reviewer disagreements are commonly resolved through constructive discourse and the documentation of a shared experience. This involves the reviewers engaging in a collaborative process to address inconsistencies and arrive at a mutually agreed-upon conclusion or comprehension.

Data Extraction

The researchers conducted a comprehensive evaluation of studies that examined the SDH within military communities. The process of data extraction involved the identification of eligible research, the selection of studies that met the inclusion criteria, and the retrieval of relevant data from the chosen studies.

The study started with a comprehensive exploration of various electronic databases, such as PubMed, Google Scholar, and CINAHL, using a predetermined set of search terms related to military health and SDH. The identified studies' titles and abstracts were assessed to ascertain whether they met the criteria for inclusion. Finally, data were extracted from the selected studies utilizing a standardized form. The data extraction form details the study design, study population, examination strategy, outcomes, and significant findings.

The obtained data was subsequently assessed to identify prevalent themes and patterns for strategies to improve health equity in military communities. The scoping-systematic review results were employed to develop recommendations for future research and practical applications in this area.

Data Synthesis

The utilization of a narrative approach was employed to amalgamate the information

obtained from the studies that were incorporated, owing to the heterogeneity in their research designs and results. The data was organized and presented in a tabular format. The review's findings were effectively communicated through tables and figures, providing a comprehensive and lucid presentation of the conclusions.

Results

This research encompassed nine studies that employed diverse study designs, including qualitative and quantitative methodologies. A minimum of thirteen variables were found capable of being compared across various research studies. Variables that share similarities are represented using identical colors. Nevertheless, the absence of variables with distinct colors implies a lack of similarity between the variables across the studies, as indicated in Table 1.

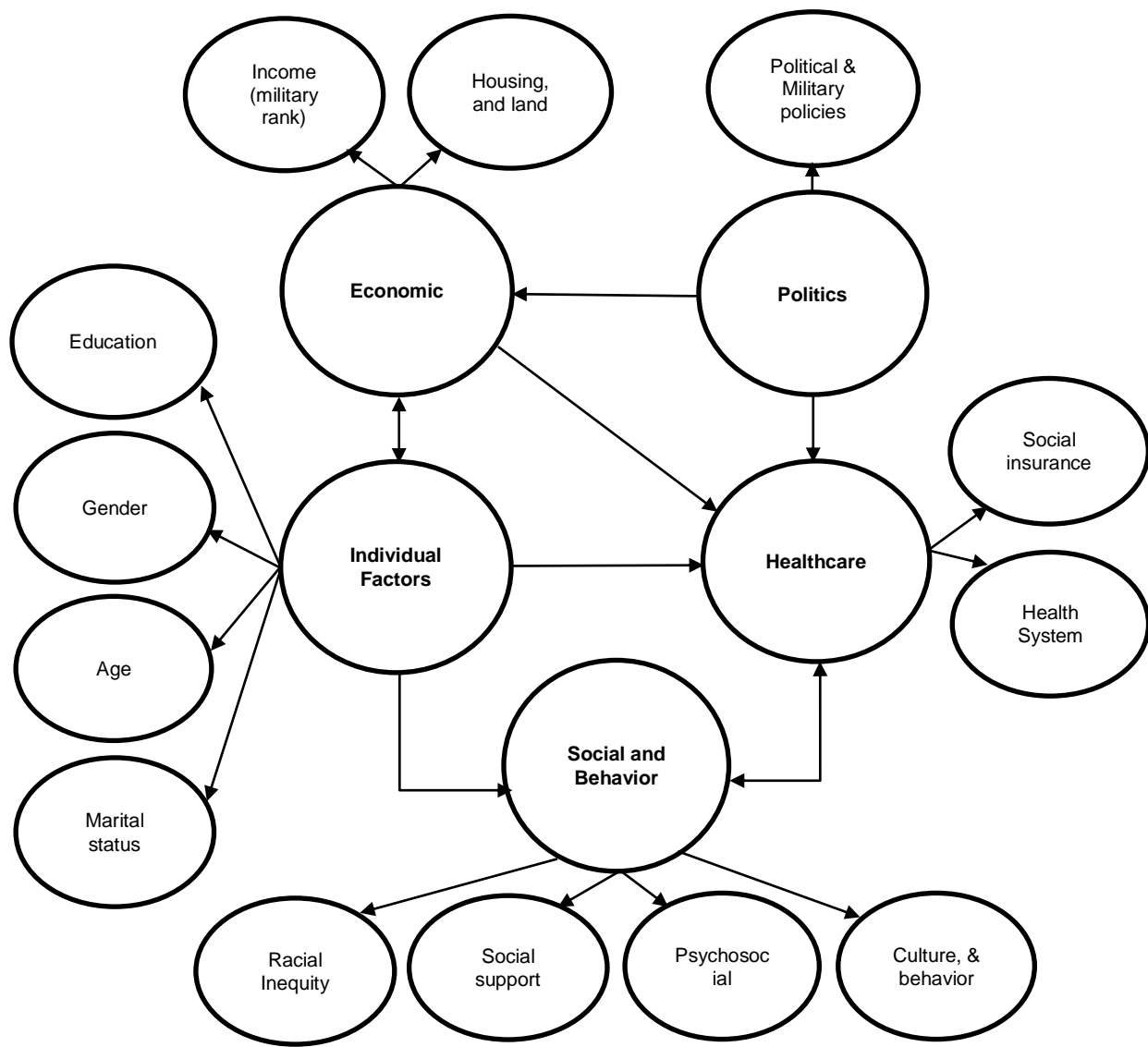
A minimum of five factors have an impact on SDH. Various factors including individual, economic, political, healthcare, and social-behavioral are implicated. The primary determinant has to do with factors such as education, gender, age, and marital status, which have been extensively scrutinized. The second factor pertains to the economic aspect. The economic factor subjected to the most analysis is the income based on military rank, with housing and land following closely behind. Politics constitutes the third factor, grounded on the military's political dimensions and policies. The fourth factor is healthcare, which is closely associated with the health system and social insurance or social protection. The fifth and last factor pertains to social and behavioral aspects. Most scholarly investigations have centered on racial disparities, focusing on culture, behavior, social values, social support (family), and psychosocial factors.

Table 1. Article Studying the Social Determinants of Health in Military

Study 1 [16]	Study 2 [17]	Study 3 [18]	Study 4 [19]	Study 5 [20]	Study 6 [21]	Study 7 [22]	Study 8 [23]	Study 9 [24]
Governance	Socio-economic	Age	Age	Gender	Education	Marital status	Military policies	Age
Macro-economic policies	Political	Marital status	Gender	Handling problems oneself	Marital Status	Sex	Racial Inequity	Gender
Housing, and land	Education	Race	Race	Occupational culture	Income	Age		Ethnicity
Education	Health System	Sex	Ethnicity		Employment	Healthcare needs		Race
Culture and societal values	Behaviors	Locale	Marital Status		Rurality	Economic and monetary factors		Live with significant other
Socio-economic position	Psychosocial	Mental health disorders	Sexual Orientation		Trauma	Education level		Education level
Gender		Violence	Education Level		Social Support	Social insurance		Income (military rank)
Education		Housing instability	Employment Status		Family			
Occupation		Employment /financial	Currently Homeless		Justice Involved			
Social protection		Legal issues	Service Branch		Financial Barriers			
Ethnicity		Social/familial problems	Service Type					
Behaviors and biological factors		Lack access to care/transportation	Service Era					
Psychosocial factors		Non-specific psychosocial needs	Deployed					
Health system			Combat					

There are thirteen or more factors in the same study. (1) Age; (2) Gender; (3) Education; (4) Marital status; (5) Political and Military policies; (6) Racial Inequity, race, ethnicity; (7) Occupational culture, behavior, and societal values; (8) Income (military rank); (9) Health System; (10) Psychosocial; (11) Social insurance; (12) Housing, and land; (13) Social support (Family). Fig. 2 indicates that economic variables constitute the most significant social determinants of health for military personnel.

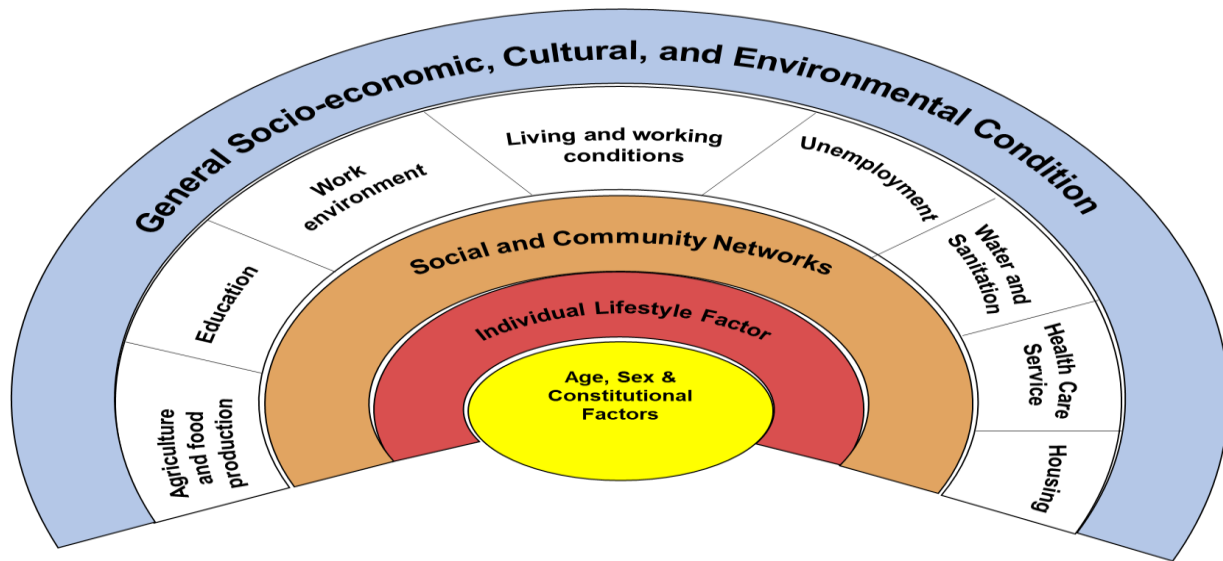
Fig 2. The Result of Social Determinants of Health in the Military Framework



Various individual factors impact the healthcare choices made by military personnel. These factors are interrelated with social and behavioral patterns and linked to the economy. The impact of education level on military rank is contingent upon various individual factors, including gender, age, and marital status, within the context of a military career. Multiple factors can influence the selection of healthcare, social environment, and behavior for members of the military. Furthermore, the economic dimension is

subject to the influence of individual nations' political determinations and military spending strategies. The aforementioned will potentially affect the welfare of individuals in the armed forces. The enforcement of the health system, which includes screening, psychological consultations, illness, and military health coverage, is also influenced by politics. The quality of healthcare services provided by the military impacts the use of healthcare facilities by military personnel.

Fig 3. Social Determinants of Health Model [28]



Discussion

The health of military personnel has been a significant concern in several nations due to the hazards associated with communal living, deployment, and hazardous conduct. The multifaceted determinants of health in the military encompass a range of individual and psychosocial factors [16]. Military personnel and their families are subject to various psychosocial factors that can impact their well-being. These factors include participation in wars and critical missions, immigration, concerns about loss and mortality, challenges balancing work and family responsibilities, separation from loved ones, and limited autonomy. Military organizations are composed of personnel with diverse social and professional backgrounds, requirements, and conduct [25]. Failure to attend to an individual's needs and desires may lead to dissatisfaction, disillusionment, and unconventional behavior.

SDH are essential elements that considerably impact an individual's health and related outcomes, such as overall well-being. The health status of individuals can be affected by various factors associated with physical, social, economic, and cultural environments, which can lead to inequality and inequity. The social

determinants of health encompass a wide range of factors such as genetics, lifestyle choices, environmental conditions, socio-economic status, educational attainment, employment circumstances, food accessibility, healthcare availability, housing conditions, social marginalization, cultural and religious beliefs, and social welfare systems (as illustrated in Fig. 3). Health inequality can give rise to disparities in the capacity of individuals to function and in their social standing, leading to uneven living circumstances and to the inadequacy of governmental interventions.

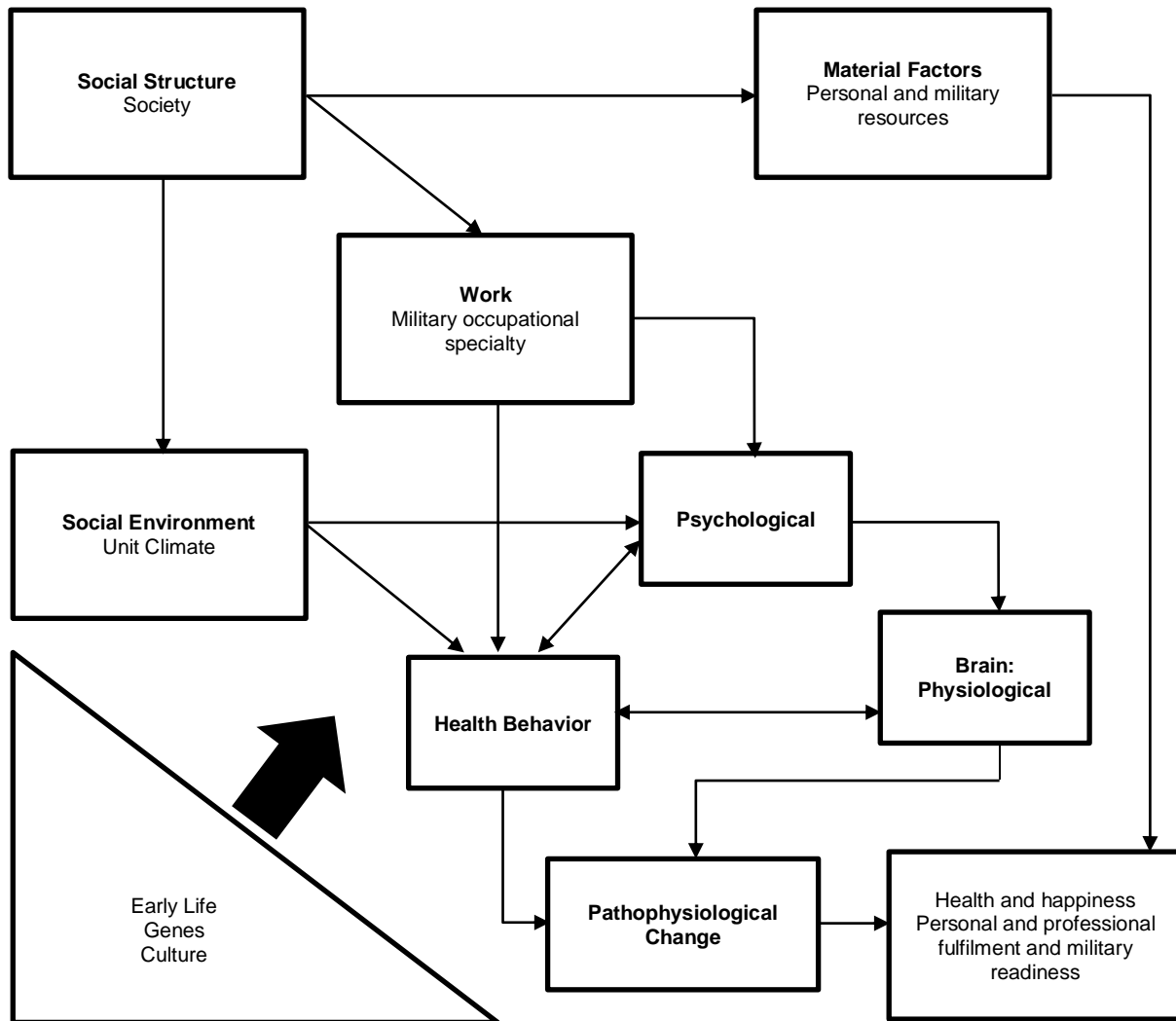
Understanding the mechanisms through which social determinants impact health is imperative for the tackling of worldwide health disparities stemming from avoidable inequalities in living and occupational circumstances. Considering the lack of success in reducing inequalities and inequities through health interventions targeted at disease prevention and mortality reduction, there is a need for community-based approaches, such as the SDH approach, that can deliver more effective health interventions [26]. In 2005, the Commission on Social Determinants of Health (CSDH) was formed by the World Health Organization (WHO)

to address the dearth of empirical data on social determinants. The commission sought to devise and execute efficient policies and protocols to eradicate health disparities and imbalances [27]. The CSDH prioritizes the examination of underlying determinants that pose a threat to health compared to other initiatives in the field of global health.

As applied in the military context, the SDH model emphasizes the interplay between the constructs of nurture, genes, and culture (environment), which are considered upstream factors that influence various aspects of an individual's life. This model is depicted in Fig. 4.

The impact of social structure on psychological and health behavior, as well as on personal and military resources (material factors), is reflected in the social environment. The model emphasizes the psychological and pathophysiological alterations that impact an individual's overall well-being, contentment, occupational and personal satisfaction, and preparedness for military duties. This study, as depicted in Fig. 2, identified additional factors that significantly impact the health of military personnel. Hence, to enhance their holistic health of military personnel, it is imperative to acknowledge and tackle the distinct SDH that impact their well-being.

Fig 4. Social Determinants of Health in the Military [29]



Individual

Military personnel's educational attainment and academic qualifications can create distinct socio-economic strata that impact their employment prospects, earnings, and cognitive abilities [30]. The provision of education on preventive measures to avoid injuries and illnesses during training and deployment, identification of signs and symptoms of mental health issues, training in first aid and emergency medical procedures, and education on health and safety protocols to mitigate the risk of exposure to toxic substances, infectious diseases, and environmental hazards are among the measures that can be taken [31]. Women serving in the military encounter distinctive quality of life and health concerns due to their minority status within a historically male-oriented culture that prioritizes masculine norms and values [32]. This can result in a significant number of women leaving the service due to various reasons such as medical issues, misconduct, inadequate performance, pregnancy, or the responsibilities of parenthood. The military population encompasses individuals ranging from 18 to 50 years of age who exhibit diverse health statuses. There are discernible health disparities across various age cohorts, with female veterans of reproductive age exhibiting a higher prevalence of health problems than their male counterparts within the same age bracket [33]. The multifaceted nature of the relationship between marital status and health disparities among military personnel has been established. Married military personnel tend to have access to superior health-care and social support compared to their unmarried peers [34].

Economic

The influence of military rank on health outcomes is a crucial factor, especially among veterans with extended service periods [35]. In 2000, mid-grade enlisted sailors, soldiers, or airmen at an E5 paid grade earned 10 percent less than the median American. Military personnel encounter noteworthy obstacles concerning their mental well-being. Additionally, Martins & Lopes, (2012) [36] have observed that certain characteristics of their work processes can influence the illness patterns of military personnel. The MHS, a health-care delivery system that caters to 9.4 million beneficiaries worldwide,

incurs an annual cost of around \$50 billion. The impact of housing on the health of military families is a significant area of concern, given their frequent relocations and reliance on government-provided housing. Substandard housing and frequent relocations can adversely impact military families' mental and physical health [37]. Many military tenants hold unfavorable perceptions regarding their base housing, with certain individuals highlighting substandard conditions that may give rise to severe health hazards [38]. However, the worth of military housing surpasses the allowance for junior enlisted personnel with families by approximately 40 percent, and military members perceive limited distinctive advantages to residing on base [39].

Political

The deployment of military personnel to combat zones is a significant factor that exposes them to various physical and psychological stressors [40]. This exposure increases the likelihood of developing mental health disorders, including PTSD, depression, and anxiety [41]. Policymakers must take into account the potential effects on military health during the process of devising and executing policies. According to the National Academies of Sciences and Medicine (2019), giving precedence to the physical and mental health of military personnel and their families is imperative. These individuals make substantial sacrifices in their commitment to serving their nation [42].

Health care

The attainment of health equity requires a focus on the determinants of health, which serve as the primary drivers of health disparities. Military Health System (MHS) plays a pivotal role in advancing parity and fairness in the health-care of military personnel [43]. The existing health monitoring systems, modeled after those used by military forces, should be replaced by a screening approach considering the temporal aspect of disease monitoring. One of the crucial duties of a commander is to ensure the well-being of the armed forces, including their physical and mental health [44]. Military health insurance benefits are available to active-duty service members and their families, as well as to reserves, retired, and separated personnel [45].

Social-behavior

The Medical Health System (MHS) has a crucial function in upholding the National Defense Strategy by guaranteeing the preparedness of both the medical force and the military personnel and providing top-quality medical benefits [46]. However, the military population experiences racial disparities that may adversely affect the health outcomes and access to care for active-duty soldiers and their families [47]. In addition, the Military Health System (MHS) has pledged to furnish current and relevant data regarding health issues that may arise from environmental dangers present in military housing [48]. Sufficient social support has the potential to mitigate mental and psychological anguish, physical health complications, and mortality hazards associated with severe ailments. The occupation of military personnel is associated with notable stressors that may result in psychological issues and negative outcomes for their families and institutions [49]. The gradual impact of stress-related diseases on various body systems, including the immune system, can weaken or disrupt them [50]. The Ministry of Health and Ministry of Defense are not obligated to enhance the current situation. Therefore, the suggested course of action, which encompasses a vision, strategic objectives, and interventions for social health, should be executed in part by the Ministry. The remaining components require advocacy efforts from other sectors.

Despite the well-established health implications of warfare, there has been little emphasis on the acquisition of skills and abilities aimed at averting the occurrence of armed conflicts. The ethical principles of public health prioritize the identification and resolution of the underlying causes of disease and negative health outcomes. Consequently, a task force was established to suggest competencies that seek to comprehend and avert the political, economic, social, and cultural factors that contribute to armed conflict [51]. The integration of these competencies into public health education and practice can enable public health professionals to significantly contribute towards the prevention of war and promotion of peace. We underscore the imperative for cooperation between public health professionals, scholars, and activists in order to confront the intricate elements that give rise to armed hostilities.

Conclusion

The SDH are crucial factors that influence the health and well-being of military personnel. At least thirteen factors affect SDH, including age, gender, education, marital status, political and military policies, racial inequity, occupational culture, income, health system, psychosocial factors, social insurance, housing, and social support. Among these factors, economic variables are the most influential in military personnel's SDH. Individual, economic, political, health-care, and social-behavioral factors determine SDH. Understanding the importance of social determinants by policymakers is essential in addressing health inequalities and increasing equity. Military forces are at risk of various diseases because of their collective life, missions away from home, and risky behavior. Failure to respond to their needs and demands can cause disappointment, disillusionment, and unusual reactions. Addressing the social determinants of health should be a top priority for military organizations to ensure the well-being of their personnel and promote overall societal health. Military organizations must prioritize social, economic, and cultural determinants of health when making policies and decisions. The health-oriented approach is necessary for social health progress, and intersectoral collaboration is critical for success. While the responsibility for implementing the proposed direction for social health rests with the Ministry of Health and the Ministry of Defense, advocacy efforts from other sectors are also necessary.

Abbreviations

PTSD: Post-Traumatic Stress Disorder; TBI: Traumatic Brain Injuries; MHS: The Military Health System; SDH: Social Determinants of Health; CSDH: Commission on Social Determinants of Health.

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Authors' contributions

RF, HZA, and NL conceptualized the study. RF performed the literature search; RF, HZA, and NL participated in the screening process; RF extracted data. RF drafted the manuscript. HIE review in the aspect of the military. SS review in the aspect of the SDH. All authors who subsequently offered significant feedback thoroughly examined the manuscript's draft versions. Each author has made a noteworthy contribution to the manuscript, and all authors have thoroughly reviewed and granted approval to the final version.

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