Exploring Influences of Eating Behaviors Among Emerging Adults in the Military

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ABSTRACT
Objective: Identify factors influencing eating behaviors among emerging adults in the military.
Design: Focused ethnography using interviews, observations, and artifacts for data.
Setting: Three US Naval installations.
Participants: Thirty-two active-duty Sailors aged 18–25 years.
Analysis: Qualitative data were organized in NVivo and analyzed sequentially to categorize culturally relevant domains and themes using a social ecological model (SEM). Descriptive statistics were used to describe questionnaire data in SPSS (version 27.0, IBM, 2020).
Results: Leaders encouraged healthy eating through policies and messages, but cultural contradictions and environmental barriers undermined Sailors’ efforts to eat healthily. Stress and resource constraints (intrapersonal), peer pressure (social), unhealthy food environments and lack of access to food preparation (environmental), and eating on the go because of mission-first norms (cultural) promoted unhealthy eating behaviors. Nutrition and culinary literacy (intrapersonal); peer support and leadership engagement (social); access to healthy, convenient, and low-cost foods (environmental); and indoctrination to healthy eating during recruit training (cultural) positively influenced eating behaviors.
Conclusion and Implications: The eating behaviors of service members are influenced by many modifiable factors. Targeted education, leadership engagement, and policies that make nutritious foods easily accessible, appealing, and preferred are needed.
Key Words: military, eating behaviors, social ecological model, focused ethnography (J Nutr Educ Behav. 2023;55:331–342.)
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INTRODUCTION
Emerging adulthood (aged 18–25 years)1 is a formative period for developing life-long eating behaviors.2 Eating behaviors—actions related to food consumption3—are major determinants of health. Perceived time constraints, cost, convenience, social norms, and unhealthy food environments are factors4,5 contributing to unhealthy eating by emerging adults. Unhealthy eating behaviors such as overeating foods high in saturated fat, added sugar, and salt and under-eating nutrient-dense foods increase the risk of developing preventable lifestyle-related diseases and gaining excess body weight.

More than half of active-duty enlisted service members are emerging adults.6 Despite the need to maintain body composition and fitness standards,7 many become overweight or obese after joining the military.8 Furthermore, most service members fail to meet national guidelines for fruit and vegetable intake9,10 and engage in unhealthy eating behaviors for weight control.11 Poor nutrition and unhealthy eating behaviors can impair service members’ health and performance (physical and mental capabilities), negatively impacting warfighter effectiveness and mission readiness.12 The Department of Defense Total Force Fitness Framework identifies nutritional fitness as 1 of 8 domains supporting service members’ health and well-being.13 Nutritional fitness is the “provision and consumption of foodstuffs in quantities, quality, and proportions sufficient to preserve
mission performance and to protect against disease and/or injury. To achieve the goal of nutritional fitness, service members must develop healthy eating behaviors.

Improving service members’ nutritional fitness requires an integrated and comprehensive understanding of their eating behaviors. From a social ecological perspective, eating behaviors are complex actions influenced by multiple interconnected factors. Story and colleagues created a social ecological framework for understanding the influences of eating behaviors within and among 4 levels; interpersonal, social environments (networks), physical environments (settings), and macro-level environments (sectors). Importantly, factors within levels are not always mutually exclusive. Research on eating behaviors of active-duty service members is limited and focuses mainly on eating disorders and disordered eating. Few studies have examined contextual factors that influence their eating behaviors, particularly Navy service members who consistently have a higher prevalence of obesity than their counterparts. This study aimed to explore interpersonal, social, and environmental factors influencing eating behaviors among emerging adults in the military, specifically junior enlisted Sailors in nondeployed settings, within the context of Navy and military culture.

**METHODS**

This study was a focused ethnography guided by a social ecological model (SEM). We followed an interpretive philosophical paradigm in which meaning is socially constructed and situated within the context of the group. Consistent with ethnographic methodology, we aimed to filter what was learned from the emic (insider’s) perspective of reality through the lens of the etic (outsider’s or researchers’) perspective to make sense of the data and provide the most accurate cultural interpretation.

**Setting, Participants, and Recruitment**

The settings were Naval bases in Maryland within the National Capital Region. The Uniformed Services University of the Health Sciences Human Research Protection Program Office approved this study as exempt human subject research under Category 2 as defined by 32 CFR 219.104 (d) and therefore did not require Institutional Review Board review. The Human Research Protection Program Office waived written consent and required oral consent to participate. The first author obtained support from the base and facility leadership and communicated with key stakeholders to build rapport and assess study feasibility. We used purposeful sampling to recruit active-duty junior enlisted Sailors (pay grades, E1-E4) aged 18–25 years, working as a Hospital Corpsman (HM, medical specialist) or Master-at-Arms (MA, security specialist) to participate in semistructured interviews lasting about 30–60 minutes. Enlisted Sailors’ pay grade (or rank) begins at E1 and ends at E-9; most recruits must work up from E1. Hospital Corpsman and MA are 2 of ≥ 50 enlisted occupations in the Navy stationed at almost any shore base. We chose these 2 service ratings for feasibility and different occupational tasks and perspectives. We used multiple recruitment strategies, including flyers, emails, and talks during group meetings. Participation was voluntary, and the first author offered Sailors an information sheet regardless of participation. Recruitment and data collection occurred between March 2020 and October 2020.

**Data Collection**

The research process included collecting multiple forms of evidence—observations, semistructured interviews, informal interviews, and artifacts (eg, documents and photographs). The first author, a doctoral candidate with experience and training in qualitative research, collected all data and worked closely with the other authors to discuss and analyze the findings. She conducted observations in settings in which participants lived, worked, and ate, beginning with grand tour observations (eg, the military base) and moving toward focused and selective observations (eg, dining facilities). For example, the first author made observations of the food environments (eg, restaurants and food placement), community kitchens (eg, supplies and functionality), and participants’ eating behaviors in their work settings. To ensure an adequate description that uncovered explicit and tacit cultural knowledge, the first author took photographs of the food environment and kept written field notes of observations and interactions focusing on the elements of place, actor, and activity and recorded descriptions, informal conversations, reflections, and questions.

The first and second authors framed the initial ethnographic interview guide to elicit responses within the SEM, refined the interview guide and piloted it with 4 Sailors before the first interview. After piloting, the first author made minor changes to improve clarity and minimize leading questions. A copy of the interview guide can be found in the Supplementary Data. Because of coronavirus disease 2019 (COVID-19) restrictions and work schedules, participants were offered the option to interview face-to-face, via video conference, or by telephone. All interviews were audio-recorded and transcribed using NVivo (QRS International Pty Ltd, 2020) transcription service. The first author conducted quality controls (ie, edited transcription errors and ensured verbatim transcription) on all transcripts, and the second author provided a second verification of 3 interviews selected at random. After the interview, participants completed a demographic and a Healthy Eating Score-7 questionnaire in electronic formats. The demographic questionnaire included the following items: age in years, sex (ie, female and male), ethnic background (ie, Hispanic or Latino/Not Hispanic or Latino), racial background (ie, African American/Black, American Indian/Alaskan Native, Asian American, Pacific Islander, biracial/multiracial, Caucasian/White, Other [Please specify]), paygrade (ie, E1, E2, E3, E4), rate (ie, HC and MA), years on active duty, housing status (ie, barracks [on base], base housing [on base], and off base) the number of adults in the household, height in inches, and weight in pounds.
(questionnaire provided in the Supplementary Data). The HES-7 is a 7-item self-report questionnaire designed to rapidly assess the overall diet quality of service members and the extent to which they comply with Dietary Guidelines for Americans. Healthy Eating Score-7 evaluates 7 dietary components rated on a 5-point scale; higher total scores are more desirable. The first author also conducted informal interviews (in-person and via telephone) with leaders and people with cultural knowledge of junior Sailors’ work and lifestyles to confirm data gathered from semistructured interviews, observations, and/or artifacts. The first author documented informal interviews in field notes. The first author collected and reviewed artifacts, specifically policy documents, messages related to eating behaviors, and photographs provided by participants throughout the entire data collection process. Artifacts provided additional context to the data gathered from observations and interviews to help us understand explicit and tacit knowledge of the culture. We used photograph elicitation to supplement gaps in observations and gain insider information. The first author encouraged interviewed participants to provide photographs of places in which they usually ate, prepared food, or stored food in their living or workspaces. The first author discussed photographs at the end of the interview.

Data Analysis

We conducted data analyses and collection simultaneously in a continuous, iterative, and recursive process, allowing for constant comparison, member checking, and triangulation. The first author conducted the initial coding and met biweekly with the second author, an expert in qualitative research methodology, to discuss coding, recoding, and analysis. The first author kept an audit trail of codes, memos, and iterative analysis for review and bi-monthly discussions with the third and fourth authors. For member checking, the first author invited participants, persons informally interviewed, and enlisted Sailors with knowledge of the culture to read drafts of the findings and provide feedback on accuracy and resonance with the results. We compared and contrasted data sources (eg, participants and military bases), methods (eg, interviews and observations), and data types (eg, quantitative data and interview transcripts) at multiple time points to verify data, confirm assertions, and provide strength and accuracy to the findings and conclusions. For example, we compared and contrasted photographs taken by the first author, photographs provided by participants, field notes of observations, and participants’ interviews to understand participants’ experiences with storing and cooking food in base housing. NVivo (QRS International Pty Ltd) was used to query all qualitative data, including photographs and documents, and assist in analysis. Data condensation allowed us to select, focus, simplify, abstract, and transform the data. Data were organized according to data type and read or reviewed several times to gain familiarity and a general understanding before organizing into codes, categories, and themes. The first author wrote analytic memos to provide insight into the meaning of the data, a higher level of synthesis, and an audit trail for validation. During the first coding cycle, the first author labeled the data using an eclectic combination of descriptive, a priori, in vivo, process, and value codes. The authors applied definitions to codes, wrote reflections on the codebook. Second-cycle coding involved recoding, reorganizing, and reanalizing data coded during the first cycle and finalizing the codebook. The first and second authors also categorized codes according to the SEM levels (ie, intrapersonal). Domain and taxonomic analyses occurred in conjunction with second-cycle coding to identify terms and semantic relationships to uncover elements of the culture and cultural themes.

We included the process of data display to assist with analytic reflection and interpretation. Throughout the analysis, we made interpretations of what things mean by noting the patterns, assertions, propositions, and explanations, a process described as drawing and verifying conclusions. We analyzed questionnaire data using SPSS software (version 27.0, IBM, 2020) and computed descriptive statistics according to the appropriate level of measurement. We triangulated HES-7 data with qualitative data.

RESULTS

Participant Characteristics

We conducted semistructured interviews with 32 Sailors (Table 1). The mean HES-7 score was 21.5, ranging from 10 to 32. Nine (30%) and 13 (40%) participants met dietary recommendations for fruit (2 servings/d) and vegetable (2 servings/d) intake, respectively.

The central theme identified among the emerging adults in this study is that mission drives behaviors. Participants and leaders defined “mission” as any duty, task, assignment or goal deemed important by “Big Navy”, leaders, or oneself, and often focused on the day-to-day rather than long-term priorities. From recruit training onward, meeting the mission fostered a “hurry-up-and-eat” culture, encouraging junior enlisted Sailors to choose “quick, cheap, and easy” foods. They described eating behaviors and food choices as a continuum from “eating as clean and fresh as possible” (eg, eating fruits and vegetables) to “eating like garbage” (eg, eating less healthful food and fast food). They enjoyed cooking and meal prepping but had to overcome many barriers. Even though it was costly, ordering food from a restaurant appealed to participants because it was convenient. Snacks, coffee, and energy drinks often replaced “real meals”, especially breakfast. Many modifiable intrapersonal, social, environmental, and cultural factors influenced junior enlisted Sailors’ eating behaviors. Table 2 presents the various factors contributing to junior enlisted Sailors’ eating behaviors.
The participants’ eating behaviors centered around taste, cravings, enjoyment, and familiarity with foods they grew up eating. Preferences were dynamic; some participants described shifting from old eating habits and food choices that were less healthy to enjoying more nutritious foods. Recruit training and military functions in which Sailors were exposed to different food choices encouraged them to try new foods.

Knowledge and skills. Most participants reported having basic nutrition knowledge, but deficits revolved around preparing and incorporating healthier foods into their diets and optimal eating behaviors. Some junior Sailors were confused about what constituted a healthy diet because of conflicting messages from the media, their social networks, and health professionals:

They want to [cook and eat healthily], but they don’t know where to start...there’s so much information. They don’t know what to pay attention to. (female, Hospital Corpsman)

Knowing how to cook and prepare food, often without a stove or oven, was challenging. The lack of knowledge in culinary skills led many Sailors to order prepared food, eat out, or eat packaged soups and frozen meals. Sailors were open to learning about nutrition and cooking and desired more proactive engagement and training from leaders and health care professionals.

Beliefs, values, and attitudes. The participants’ eating behaviors were influenced by the value they placed on their health and vitality, their attitudes about body image and military physical fitness, and body composition requirements. Those who placed a high value on their long-term health and energy reported wanting control over their dietary intake and focused on eating whole and nutritious foods: “I want to live as long and as healthy as possible...so it’s very important that I eat healthy and stay healthy” (male,

### Table 1. Characteristics of Sailors Who Participated in Individual Interviews (n = 32) and HES-7 Results (n = 30)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequencies, n (%)</th>
<th>HES-7 Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>17 (53)</td>
<td>19.6 ± 6.2</td>
</tr>
<tr>
<td>Male</td>
<td>15 (47)</td>
<td>23.6 ± 4.5</td>
</tr>
<tr>
<td>Age, y (Mean ± SD)</td>
<td>21.4 ± 2.4</td>
<td></td>
</tr>
<tr>
<td>Age, y (range)</td>
<td>18–25</td>
<td></td>
</tr>
<tr>
<td>Ethnic background</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>5 (16)</td>
<td>20.4 ± 6.1</td>
</tr>
<tr>
<td>Non-Hispanic or Latino</td>
<td>25 (78)</td>
<td>21.7 ± 5.8</td>
</tr>
<tr>
<td>Racial background</td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American/Black</td>
<td>4 (13)</td>
<td>22.0 ± 5.7</td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
<td>1 (3)</td>
<td>11</td>
</tr>
<tr>
<td>Asian American</td>
<td>2 (7)</td>
<td>23.5 ± 1.5</td>
</tr>
<tr>
<td>Pacific Islander</td>
<td>2 (7)</td>
<td>24 ± 2</td>
</tr>
<tr>
<td>Biracial/multiracial</td>
<td>3 (10)</td>
<td>20.0 ± 6.6</td>
</tr>
<tr>
<td>Caucasian/White</td>
<td>17 (56)</td>
<td>21.7 ± 6.3</td>
</tr>
<tr>
<td>Declined to answer</td>
<td>1 (3)</td>
<td>21</td>
</tr>
<tr>
<td>Pay grade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E1</td>
<td>3 (10)</td>
<td>19.3 ± 10.7</td>
</tr>
<tr>
<td>E2</td>
<td>5 (17)</td>
<td>20.2 ± 5.2</td>
</tr>
<tr>
<td>E3</td>
<td>16 (53)</td>
<td>21.8 ± 5.6</td>
</tr>
<tr>
<td>E4</td>
<td>6 (20)</td>
<td>22.5 ± 4.9</td>
</tr>
<tr>
<td>Housing status</td>
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<td></td>
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<tr>
<td>Barracks</td>
<td>24 (75)</td>
<td>20.4 ± 5.45</td>
</tr>
<tr>
<td>Base housing</td>
<td>2 (6)</td>
<td>30.0 ± 2.8</td>
</tr>
<tr>
<td>Off-base housing</td>
<td>6 (19)</td>
<td>22.5 ± 5.5</td>
</tr>
</tbody>
</table>

HES-7 indicates Healthy Eating Score-7

*Missing data for n = 2, valid % reported.

Note: Scores for HES-7 were totaled for a range of 7–35.

### Table 2. Factors Influencing Junior Enlisted Sailors’ Eating Behaviors Framed Within the Social Ecological Model

**Intrapersonal**
- Food preferences
- Knowledge and skills
- Resource management
- Physical activity level

**Social environment**
- Learning and training
- Role modeling
- Social support

**Physical environment**
- Availability/accessibility of foods
- Availability/accessibility of cooking and storing food

**Macro-level environment**
- Military structure
- Sociocultural norms and values

**Cultural environment**
- Mission first
- Personal responsibility
- Emphasis on physical fitness
Master-at-Arms). Participants who did not prioritize their body image were less focused on counting calories or following rigid dietary practices than participants who expressed body dissatisfaction; this group talked more about dieting and restrained eating:

I was almost 300 pounds this time last year... I'm very reserved when it comes to what I'm eating with other people... I try to limit my calorie intake. (male, Master-at-Arms)

Sailors’ eating behaviors trended with usual expectations regarding restrictive eating for weight loss and focusing on whole and nutritious foods for healthy eating.

Moods, feelings, and emotions. Moods, feelings, and emotions influenced food choices. Bad moods, feeling overwhelmed or stressed, and negative emotions led to eating foods high in fat and sugar. Feelings of boredom—especially among those who worked night shifts—led to eating junk food (eg, chips and ice cream) and overeating. When participants retired to their homes or barracks at the end of a shift, they wanted to relax and “take off the uniform”, shedding mission responsibilities and leaders’ demands:

Stress causes people, I feel, to overeat and say, why should I eat healthy? I’ve been having a bad mood. I want 25 wings... I want something that’s not good for me ‘cause who cares. (female, Master-at-Arms)

Resource management. Differences in perceived resource constraints (ie, time and money) among Sailors who shared the same work schedules, living conditions, and pay suggested that managing their resources influenced eating behaviors more than the availability of resources. Participants who prioritized their nutrition made time to grocery shop and prepare their meals and snacks ahead of time. Many Sailors believed they had to sacrifice their sleep, relaxation, and free time to eat healthily. Some participants reported strained financial situations because of constantly eating out, having debt, or helping family members back home. One participant’s transition from spending money on fast food to saving money with meal prepping captures many junior Sailors’ experience with money management and eating:

I actually really struggled with my debt at the time because I was spending so much money unnecessarily... I realized that I was spending the most amount of my money in fast food or going out to eat... (female, Hospital Corpsman)

Motivation, goals, and physical activity level. Depending on their goals, participants adopted diets and eating behaviors ranging from counting calories and macronutrients to eating a lot of protein or eating home-prepared meals and minimizing food with low nutritional value. Sailors who exercised frequently tended to eat more healthily than those who were sedentary. Participants tended to shift toward less healthful eating behaviors when their level of physical activity decreased. For example, when fitness centers closed because of COVID-19 restrictions, many participants stopped working out and started eating less healthily than before the pandemic: “We kind of correlate like meal planning with the gym. So, like now that there’s no gym, we don’t have to meal plan” (female, Hospital Corpsman). Musculoskeletal injuries were a catalyst for unhealthy eating behaviors. Following an injury, participants reported a dramatic reduction in physical activity which often led to a vicious cycle of overeating, gaining weight, and feeling depressed.

Social Environment (Network) Factors

Learning and training. Participants primarily learned about nutrition and cooking from their parents, peers, online resources, and social media. Other than a 1-hour mandatory nutrition lecture during recruit training, participants reported not receiving formal nutrition education or counseling. Participants sought information by taking the path of least resistance—asking their friends or following people on social media. Dietitians and health promotion professionals wanted to help junior Sailors improve their nutrition, and often posted flyers, passed out printed materials (eg, cookbooks), and offered a variety of classes, but their efforts were less successful than anticipated:

I’m not sure if anyone really does get nutrition information... We get emails from this one lady [health promotion specialist]. She sends out information, but like, I don’t really read it. (female, Hospital Corpsman)

Peer pressure. Peers influenced participants eating behaviors through subtle and explicit peer pressure: “I eat a lot more unhealthy things when I’m with other people just because it seems to be the trend with my group of friends” (female, Hospital Corpsman). Peer pressure was a major barrier to eating healthily, especially for those who were dieting or had restrictive diets (eg, vegetarian). Sailors believed that they were more likely to get teased or pressured to conform to unhealthy eating behavior norms of the group if they ate healthily:

So, if you eat healthy, everybody kind of laughs at you... I know it’s all in good fun, but you get more shame, I guess you could say if you’re a healthy eater” (female, Master-at-Arms)

Some participants described being pressured by their peers to eat better; positive peer pressure was often direct and explicit with friends “getting on their case or pushing them to eat better” (male, Hospital Corpsman).

Role modeling. Participants identified social media influencers and family members more than their peers or leaders as role models for eating healthily. They reported following the advice of people they aspired to look like or eat like:
I like to follow a lot of people on social media...they’re big inspirations for me and they kind of motivate me to do that [workout and meal prep]. (female, Hospital Corpsman)

Peer role models tended to be Sailors who were physically fit, worked out consistently, had lost a substantial amount of weight, or had restrictive dietary habits. When participants described peers or leaders who ate healthily, they almost always referenced individuals who identified as vegans or vegetarians: “Our Director, she’s really good about eating healthy. She’s a vegan…” (male, Hospital Corpsman).

Social norms. Injunctive social norms dictated that service members eat healthily. Signs and messages posted near vending machines, eateries, and other areas around the bases encouraged service members to make healthy choices, but they seemed to have little influence on their behaviors. Observations and participant reports suggested the social norm was eating fast food, going out to eat, drinking energy drinks, and eating on the go:

it’s eat whatever you can eat on the go...and I think if I see everyone else go out for lunch and order something I think it makes me comfortable enough to say, oh okay, I’m gonna order too. (female, Master-at-Arms)

Social support. Social support was critical to participants’ health and overall well-being. Support from family and friends influenced participants to eat healthily. Spouses, or nearby relatives supported participants by cooking healthy meals for them or with them, packing their lunches, and pushing back on participants’ requests to eat out or eat junk food. Sailors discussed “looking out for their shipmates” when their peers did not have food or time to eat because of work demands:

It’s been times I went and dug in my book bag and I had fruit. So, it was like, can this hold you over? We try to help each other out as much as possible. (female, Hospital Corpsman)

Support from peers to eat well or stay fit most often occurred in departments with good morale and leadership and in which Sailors were empathetic and understanding of one another.

Physical Environmental (Settings) Factors

Availability and accessibility of foods. Accessibility and availability of foods differed across the various work environments. In recruit training, Sailors were only allowed to eat in the galley (ie, Navy cafeteria); therefore, junk food and fast food were restricted. Participants reported that most recruits were given access to ample healthy foods and sufficient time to eat; recruits among the last groups to enter the galley tended to have less time to eat. Sailors were encouraged by their Recruit Division Commanders (RDCs), posted signs, and color-coded labeling of entrees to choose nutrient-dense foods. These healthy nudges in the recruit training environment helped some participants improve their eating behaviors and lose weight, but not all participants reported eating healthily. Some participants reported over-eating and gaining excess weight during training:

Me [and], my shipmates, we ate a lot of peanut butter and jellies. We ate a lot of cereals … it was the only thing that was like, oh, it’s sweet and it’s bread. And that’s how a lot of us gained weight. (female, Master-at-Arms)

Participants described their experiences with food and eating in recruit training and A School (specialty training school following recruit training) as night and day. Once in A School, the regimented mealtimes and food restrictions ended. Because they had the freedom to choose whether or not they ate in the galley, many participants ordered food from off-base establishments, got fast food from the on-base food court, or got snacks from vending machines. The galleys in A School also served more calorie-dense foods (eg, hamburgers and pizza) than in recruit training.

Following A school, participants, leaders, and health care professionals believed that options for healthy foods on-base at their current commands were insufficient: “...we don’t have many good places to get good nutrition” (male, Master-at-Arms). Most selected food options were from vending machines, coffee shops, convenience stores, and fast food restaurants. Some participants intentionally chose healthier options from the vending machines and sought out fast food restaurants that offered nutritious foods, such as salads or protein and vegetable bowls. Few participants reported bringing their food to work because of perceived time constraints with preparing foods and/or inadequate storage space. The galley and the commissary (ie, grocery store) were the primary outlets for nutritious foods at a reasonable price, but some perceived the options to be of low quality or undesirable:

The galley is affordable, and that’s all I could pretty much say about it. I feel like it’s a great option, but yeah, I don’t really care for the food that they serve. (female, Hospital Corpsman)

Participants also had mixed feelings about the galley. Some desired to have a galley because they would have access to various food options at low cost, whereas other participants did not want a galley because it meant they would lose additional pay or have money deducted from their pay whether or not they ate in the galley. One leader noted that the base commissary provided healthy grab-and-go options at the front of the stores, but he never heard Sailors mention taking advantage of these offerings. Coronavirus disease 2019 restrictions impacted the availability and accessibility of food on base as many eateries either closed, offered limited service hours, or only served grab and go or carryout. Cost and convenience were interconnected factors across levels within the SEM but were most frequently highlighted when participants discussed accessibility and availability of foods.

Availability and accessibility of cooking and storing food. Having access to a
full kitchen and preparing and storing foods influenced participants’ eating behaviors. Military regulations require unaccompanied Sailors in the rank of E1 to E3 and E4 with < 4 years of service to live on-base in unaccompanied housing (ie, barracks) with few exceptions (eg, no availability). Living in the barracks made it difficult to eat healthily, primarily because it was challenging for Sailors to cook whenever they wanted. They had to transport their ingredients and cookware to and from their barracks room to the kitchen, which could be a short walk down the hall or a much longer trek down “three flights of stairs and across a courtyard” to another building. Sharing a community kitchen meant they often had to wait on others to finish cooking, which was less than ideal if hungry. Cooking in an open environment was also intimidating for some Sailors. Many Sailors navigated the issues related to the community kitchen by cooking undercover in their barracks by using restricted appliances and keeping them out of site during inspections. Adequate food storage space was a problem for some, which created a barrier to meal prep and stocking up on perishable foods. Participants who lived off-base or in on-base housing reported that having their kitchen made it easier and more desirable to eat healthily:

*It really does help, healthy eating once you leave the barracks due to the ease of access of the stove and your appliances compared to living in the barracks.* (male, Hospital Corpsman)

**Workplace structure and systems.** The participants’ eating behaviors were highly influenced by the physical environment of the workplace, work schedules, workplace events involving food, and coworkers bringing in food. Many MAs reported having sporadic eating patterns ranging from fasting for the entire 12-hour shift to grazing throughout the day. They rarely got lunch breaks, and the limited space in the guard shacks made it challenging to sit down and eat. Only 1 MA stated that “you don’t feel rushed …there is time to sit and eat your food when working on the gate” (male, Master-at-Arms). Master-At-Arms night shift workers frequently relied on convenience stores off-base. The HMs interviewed had less demanding work schedules and better access to food and eating spaces than the MAs, but many still reported their busy schedules negatively impacted eating behaviors, especially those who worked in the surgery department: “…work is like really busy, so it’s really hard to have the motivation to eat healthy” (female, Hospital Corpsman). Most HMs were allotted a lunch break, but some reported working through their lunch breaks because they were expected to get the job done before taking a break. Social gatherings with food frequently occurred in clinics and hospitals to boost morale and celebrate. Food fundraisers with less nutritious options (eg, donuts) were popular in hospitals and clinics. Several Sailors mentioned it would be a good idea to sell healthier items at fundraisers but thought it would be more difficult and bring in less profit.

**Macro-level Environment (Sectors) Factors**

**Military structure.** According to participants, the military’s hierarchical structure promoted class systems among the ranks, which created inequities (real or perceived) in autonomy and resources for junior enlisted Sailors. Many participants and leaders described a precarious situation in which junior Sailors have tremendous responsibility at work and limited autonomy over their social situation: It’s never a good feeling to be treated like a kid in high school when we have adult jobs” (female Hospital Corpsman). For some, this led to a lack of motivation to do their job and maintain their health. Junior Sailors were encouraged to make good choices regarding their health and nutrition but did not always receive the knowledge, skills, or resources to do so.

**Policies and regulations.** Housing, nutrition, and physical fitness and body composition policies influenced junior enlisted Sailors’ eating behaviors. Barracks policies established requirements for residency, resources, and cooking, influencing many participants’ food choices, feeding patterns, and motivation to cook, as previously described. Department of Defense nutrition, food service, and health promotion policies encouraged nutritional fitness for optimal cognitive and physical performance but failed to regulate the disproportionate availability of unhealthy options available on military bases or mandate nutrition education beyond recruit training. Policies and regulations on food service and nutritional standards on military bases are limited to dining facilities (eg, galleys) that rely on appropriated funds (APP) (ie, funds appropriated to the military by US legislature), such as vending and fast food restaurants, are not regulated by the same health and nutrition standards as military dining facilities. Appropriated funds and Nonappropriated fund services offer healthy and nutritious options for service members, but not to the same degree.

The Navy’s physical readiness program policy aims to ensure Sailors maintain the physical fitness required to support overall mission readiness. To this end, the Navy assesses Sailors’ physical fitness and body composition via a biannual physical readiness test (PRT). Cyclical PRTs prompted most Sailors to improve their eating behaviors and increase their physical activity to pass the test. Despite explicitly stated prohibitions on compensatory behaviors (eg, starvation diets) to alter body composition assessments, participants reported that it was common for people to “fast for an entire week” or use laxatives to “make tape”. Most Sailors’ improved eating and physical activity were short-lived—almost everyone returned to their normal habits after the PRT.

**Sociocultural norms and values.** The participants’ eating behaviors were influenced by social norms and values—specifically following and emulating people on social media on the basis of their body image and...
appeal, not credentials. Going on a popular diet was a rite of passage and had little to do with maintaining the Navy’s fitness standards (except during PRT). Most participants knew a peer on a diet, had just finished, or was about to start a diet; many Sailors liked the idea of going on a plan. However, participants’ attempts at healthy dietary restraints were often undermined and unsuccessful because of peer pressure and environmental influences.

Cultural Environment Factors

Mission first. The military mission or job requirements took priority over personal desires, preferences, and/or needs, which meant Sailors learned to “suck it up”. Many participants felt pressured to work through lunch, avoid hydrating so they would not have to use the restroom, and/or skip meals or snacks throughout the day to avoid interruptions in their workflow. None of the participants stated that their leaders demanded this behavior, but it was an unwritten expectation, especially because many leaders did the same.

Leadership engagement and investment. The degree to which leaders engaged with and invested in their Sailors influenced their perceptions of themselves and their motivation to be healthy. When asked about recommendations to make eating healthily easier and more desirable, many participants suggested proactive engagement from their leaders. Leaders talked about “promoting fitness” and educating junior Sailors, but few participants believed their leaders promoted nutritional fitness. It was primarily only during recruit training that participants believed their leaders actively engaged with them about their nutrition and well-being. Participants appreciated how the RDCs “pushed them to maintain healthy eating habits” because it showed they cared.

Personal responsibility. Navy culture espoused an imbalance of shared responsibility for healthy eating behaviors, emphasizing personal responsibility to make healthy choices rather than organizational responsibility to create healthy food environments. Sailors are encouraged to eat healthily through visual messages and policies and are provided online and in-person nutrition resources. Beginning with a 1-hour nutrition class in recruit training, instructors informed Sailors that they are responsible for maintaining Navy fitness and body composition standards and must establish good habits to succeed. Instructors also note that

once training is over, the easy choice will be to return to old habits or turn to other foods such as energy drinks... and high fat and sugar snacks that do not promote optimal performance. (Personal Development Topic 2.15: Introduction to Nutrition, Recruit Training Command)

They inform Sailors that there will be pressures and external challenges to eating unhealthily, but their eating behaviors are their responsibility — no one will mandate what they eat or how they should eat: “I can’t order people not to chug Monsters...” (male, Master-at-Arms leader). Participants believed that if you wanted to know how to eat better to lose weight, maintain good health, or improve physical fitness, you had to “figure it out yourself.” It is up to the Sailor to make good choices, even if it is hard to do so:

I do see people being adults, and they have their own choices... but at the same time, if you’re not providing healthy choices... it’s definitely not helping the situation. (male, Master-at-Arms)

Misplaced incentives. Other than making weight and passing the PRT, participants had little incentive to eat healthily and maintain fitness standards. From the participants’ perspective, good nutrition was not essential for meeting the daily mission or career progression. They were incentivized to work hard, take on collateral duties, complete extra training to keep leadership happy and improve their chances for advancement. The lack of cultural incentives to maintain health and fitness was expressed in a common narrative among leaders and participants that many Sailors do the minimum: “They’re like as long as I can pass my PRT and I stay in my weight class, it doesn’t matter what I eat” (female, Hospital Corpsman).

Emphasis on physical fitness. Participants, leaders, policies, and messages often emphasized physical fitness when discussing health and readiness. Every base had 1 or more fully equipped fitness centers. Sailors who failed any portion of the PRT were required to attend the Fitness Enhancement Program, in which the primary focus of remediation was on physical training, not nutrition, even for Sailors who passed the fitness portion but failed the body composition assessment. Relying on exercise to compensate for eating junk food or excess calories was common, and several participants talked about peers who were unhealthy but very fit.

DISCUSSION

This focused ethnography explored determinants of eating behaviors among emerging adults in the military to understand how intrapersonal, social, and environmental factors within the context of military service and Navy culture influence service members’ eating behaviors. Policies, healthy eating initiatives, and leaders encouraged nutritional fitness, but cultural contradictions and environmental barriers undermined Sailors’ motivation to eat healthily. Findings from this study suggest that unhealthy eating behaviors are the default among emerging adults in the military, due in part to sociocultural norms, barracks-life, workplace structures, and food environments that encourage them to eat cheap, quick, and easy nonnutritious foods. To eat healthily, participants had to find and prepare nutritious foods, reject negative peer pressure, and opt out of social norms.

Military culture influenced Sailors’ eating behaviors. Unrestricted access to food during regimented meal times in recruit training prompted some Sailors to consume more than usual. Findings of overeating during recruit training are consistent with research showing a shift toward decreased
reliance on internal satiety cues among Army, Air Force, and Marine recruits. Unlike previous studies reporting recruits were pressured to eat quickly or did not have enough time to eat during training, our participants noted that as recruits, they had adequate time to eat, and some ate additional servings. Having sufficient time to sit and eat can support healthy eating habits and digestion, but fear of hunger and unfeathered access to food may promote overeating. Workplace structures and systems undermined and supported healthy eating behaviors. Work environments providing time and space for Sailors to eat and store food made eating easier, whereas work environments that kept Sailors on the go contributed to unhealthy eating behaviors. Participants frequently cited conditions related to work schedules and leadership expectations as reasons for skipping meals, ordering fast food, eating junk food, eating quickly, and drinking energy drinks. These eating behaviors were socially acceptable and modeled by leaders. In a study of 1,591 male soldiers, Jayne and colleagues found that eating easier, whereas work environments that kept Sailors on the go contributed to unhealthy eating behaviors. Participants frequently cited reasons for skipping meals, ordering fast food, eating junk food, eating quickly, and drinking energy drinks. These eating behaviors were socially acceptable and modeled by leaders. In a study of 1,591 male soldiers, Jayne and colleagues found that eating rapidly, consuming fast- and convenience foods, and skipping breakfast were associated with body composition failures and lower physical performance. Military leaders must address elements of workplace culture in the military that undermine healthy eating behaviors. Emerging adults in the military need practical tools for preparing meals and scheduling eating times that support proper fueling when they have demanding schedules, work shifts, and/or do not have access to proper food storage and preparation. Social events and fundraisers promoting calorie-dense and nutrient-deficient foods challenged participants’ efforts to maintain healthy eating habits in the workplace. Leaders and employees will need to realign formal and informal systems to create new and healthy norms to create a healthy workplace eating culture.

Military food environments observed in this study may be food deserts and food swamps. Food deserts—communities with limited access to nutritious foods and supermarkets—have been associated with poor dietary intake and increased risk of obesity. Food swamps—communities in which volumes of high fat, energy-dense fast foods and junk foods greatly exceed nutritious options—are a better predictor of obesity rates than food deserts. In this study, the participants reported obtaining unhealthy vs healthy foods on base was more convenient. The military food environments provided easy access to low-cost, palatable, and calorie-dense foods. Energy drinks were widely available and easily accessible at every base, including hospitals and clinics. Consistent with previous research reporting high energy drink use among service members, this study found that consuming energy drinks was a cultural norm and represented one of the many cultural contradictions related to nutritional fitness. If energy drink consumption is to be limited, as recommended to recruits during training, they need to be made less available, and leaders and health care providers need to educate Sailors on their proper use.

The commissary and military dining facilities were typically the only food outlets providing a high proportion of nutritious food relative to unhealthy options. Findings from this study support previous research with active-duty Army soldiers who perceived that nutrition was out of their control because of the unhealthy food environments on base and in their work settings. It is unrealistic, and arguably unfair, to expect service members to maintain nutritional fitness in an environment overrun with unhealthy foods. Improving access to affordable and nutritious foods and providing targeted culinary education for emerging adults living in the barracks would be additional steps to facilitate healthy eating behaviors.

Leadership support and engagement positively influenced junior Sailors’ eating behaviors, and participants believed their leaders in recruit training cared about their success. These results support previous research demonstrating leaders’ positive influence on recruits’ nutrition during recruit training, but there is a gap or decline in engagement after training. Leaders in A school and participants’ current units were less proactive about helping to support healthy eating behaviors and seemed to place less value on their nutrition than RDCs. Leaders set the tone by clarifying and executing the mission, which creates barriers or removes obstacles. Senior leaders and middle managers must role model and proactively support healthy eating behaviors to change the culture positively. Participants experienced gaps between their ideals and actual behaviors. Most Sailors stated it was important to eat healthily, but less than half met the minimum fruit and vegetable intake recommendations. They were aware of the risks associated with eating and drinking unhealthy foods and beverages and the benefits of consuming a balanced and nutritious diet, but all too often, they chose foods and drinks that undermined their health and fitness. Intrapersonal factors that facilitated healthy eating behaviors centered around having an internal locus of control, health-oriented goals, autonomous motivation, adequate nutrition knowledge and culinary literacy, and prudent management of time and money. Previous research supports these findings, and efforts that target individual behavior change among junior Sailors should focus on developing and sustaining these facilitators. However, as this study shows and the SEM postulates, individual behavior change efforts without social, environmental, and cultural support are less likely to be effective in the long term. Good intentions and willpower are no match for peer pressure. Eating out is a common and enjoyable way to socialize with friends, and people are likelier to choose unhealthy options as a treat or reward when dining out. Health professionals can educate emerging adults in the military on how to choose more healthful foods and positively influence their friends when dining out. They can also become familiar with and endorse evidence-based healthy eating applications for their patients. Participants who tended to eat healthily surrounded themselves with those who perceived their nutrition as integral to their health and fitness. Identifying ways to enhance social support for healthy
eating may make it easier for junior enlisted Sailors to eat healthily when living and working in unhealthy food environments.

Sailors modified their usual eating behaviors during PRT evolutions by adopting healthy eating habits or engaging in disordered eating and compensatory behaviors, consistent with previous research on making weight behaviors. Leaders must support culture changes and systems-level initiatives that encourage healthy eating habits year-round, address weight gain prevention, and provide adequate weight management support. Researchers have reported maintenance of military appearance (eg, looking neat and trim in uniform) as a reason service members strive to manage their weight and body composition. Findings from this study suggest that among junior enlisted Sailors, making weight during cyclical testing and not maintaining military appearance may be the primary reason for unhealthy weight control practices in the Navy.

A major strength of this study was the combined use of a focused ethnographic design and SEM to gain a holistic perspective within the context of an understudied cultural group. This study builds on previous research on eating behaviors among service members by identifying a spectrum of prominent eating behaviors during the introductory years of military service and provides new knowledge on perceived barriers and facilitators to healthy eating among emerging adults in the military. This study has limitations. All participants volunteered for this study, which raises issues of self-selection or participation bias. Restrictions on social interactions with participants because of military regulations and COVID-19-related restrictions imposed some limitations in that eating behaviors in many public settings could not be observed. Finally, our findings are limited to the context and settings of this study. Cautions must be exercised when applying results to emerging adults in the military across the different services and environments. However, findings may transfer to other groups and encourage targeted inquiries of similar issues.

IMPLICATIONS FOR RESEARCH AND PRACTICE

This study provides new knowledge and highlights a critical need for action among health practitioners, leaders, and policymakers to support the promotion, adoption and maintenance of healthy eating behaviors among emerging adults in the military. Findings from this study suggest that junior enlisted Sailors working in nondeployed settings may have eating behaviors that contribute to unhealthy weight gain, diet-related diseases and injuries, and poor cognitive and physical performance, which negatively impacts overall military readiness. To achieve nutritional fitness, the Department of Defense and the Navy need policies that increase access to affordable, healthy and nutritious options and significantly decrease the availability and density of fast foods and junk foods on military bases. Study findings also support providing targeted nutrition education during training evolutions and delivering training cyclically throughout a service member’s career. Health practitioners can work proactively across disciplines and with military leaders to support a culture of healthy eating in the military. Action steps can include dismantling negative social climate factors, strengthening positive social influence, and objectively assessing the military nutrition environment to target areas for improvement. Future research could integrate quantitative and qualitative methods to examine interactions among individuals, environments, social networks, and behaviors to understand better the determinants of eating behaviors and diet-related outcomes of emerging adults in the military.

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SUPPLEMENTARY DATA

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