

AWARD NUMBER: W81XWH-18-1-0698

TITLE: Eating Disorders in Veterans: Prevalence, Comorbidity, Risk, and Health Care Use

PRINCIPAL INVESTIGATOR: Zafra Cooper

CONTRACTING ORGANIZATION: Yale University

REPORT DATE: OCTOBER 2022

TYPE OF REPORT: Annual

PREPARED FOR: U.S. Army Medical Research and Development Command
Fort Detrick, Maryland 21702-5012

DISTRIBUTION STATEMENT: Approved for public release; distribution is unlimited.

The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision unless so designated by other documentation.

REPORT DOCUMENTATION PAGE		<i>Form Approved</i> <i>OMB No. 0704-0188</i>
<small>Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.</small>		
1. REPORT DATE OCTOBER 2022	2. REPORT TYPE Annual report	3. DATES COVERED 30SEPT2021 - 29SEPT2022
4. TITLE AND SUBTITLE Eating Disorders in Veterans: Prevalence, Comorbidity, Risk, and Healthcare Use		5a. CONTRACT NUMBER W81XWH-18-1-0698
		5b. GRANT NUMBER PR171449PI
		5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S) Zafra Cooper E-Mail: zafra.cooper@yale.edu		5d. PROJECT NUMBER
		5e. TASK NUMBER
		5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Yale University 105 Wall Street New Haven CT 06511-8917		8. PERFORMING ORGANIZATION REPORT <u>REPORT</u>
9 . SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Medical Research and Development Command Fort Detrick, Maryland 21702-5012		10. SPONSOR/MONITOR'S ACRONYM(S)
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for Public Release; Distribution Unlimited		
13. SUPPLEMENTARY NOTES		

14. ABSTRACT

This application focuses on eating disorders (EDs) and addresses several FY17 PRMRP Areas for Encouragement, including prevalence of diagnosable EDs and other clinically significant disordered eating, associations between ED symptoms and military-unique behaviors and conditions, and treatment patterns of individuals with EDs. We will establish a cohort of post-9/11 Veterans who were separated from service within the past year in order to: (1a) Examine the prevalence of full/subthreshold EDs among male and female Veterans. (1b) Examine the proportion of full/subthreshold EDs among vulnerable subgroups of Veterans. (1c) Examine temporal associations among EDs and comorbid disorders, including PTSD, depression, anxiety, and alcohol and substance use disorders. (2a) Document treatment patterns and healthcare preferences among male and female Veterans with probable full/subthreshold ED diagnoses. (2b) Compare treatment patterns for Veterans with probable full/subthreshold ED diagnoses to Veterans without ED diagnoses. (2c) Identify barriers to care for Veterans seeking mental health treatment in general and for EDs specifically. (3) Identify the impact of general and military/Veteran-specific risk/maintenance factors for ED symptoms and investigate gender differences. (4) Validate and compare two existing, scalable, screening measures of EDs in a Veteran sample.

Data collection began in January 2020 and is complete.

15. SUBJECT TERMS

Eating disorder in Veterans; risk factor assessments; comorbid disorders; health care use; survey assessments; interview assessments

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON USAMRDC
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER <i>(include area code)</i>
U	U	U	UU	16	

TABLE OF CONTENTS

	<u>Page</u>
1. Introduction	6
2. Keywords	6
3. Accomplishments	6
4. Impact	8
5. Changes/Problems	9
6. Products	11
7. Participants & Other Collaborating Organizations	13
8. Special Reporting Requirements	16
9. Appendices	16

1. **INTRODUCTION:** *Narrative that briefly (one paragraph) describes the subject, purpose and scope of the research.*

The specific aims of the project are to recruit a nationally representative cohort of post-9/11 veterans in order to (1a) Examine the prevalence of full and subthreshold eating disorders (EDs) among male and female Veterans. (1b) Examine the proportion of full and subthreshold EDs among vulnerable subgroups of Veterans. (1c) Compare temporal associations among EDs and comorbid disorders, including PTSD, depression, anxiety, and alcohol and substance use disorders. (2a) Document treatment patterns and healthcare needs/preferences among male and female Veterans with probable full or subthreshold ED diagnoses. (2b) Compare treatment patterns for Veterans with probable full and subthreshold ED diagnoses to Veterans without ED diagnoses. (2c) Identify barriers to care for Veterans seeking mental health treatment in general and for EDs specifically. (3) Identify the impact of general and military/Veteran-specific risk factors for ED symptoms. (4) Validate and compare two existing screening measures of EDs in Veterans.

2. **KEYWORDS:** *Provide a brief list of keywords (limit to 20 words).*

Eating disorders, veterans, military stressors, comorbid disorders, risk factors

3. **ACCOMPLISHMENTS:** *The PI is reminded that the recipient organization is required to obtain prior written approval from the awarding agency grants official whenever there are significant changes in the project or its direction.*

What were the major goals of the project?

List the major goals of the project as stated in the approved SOW. If the application listed milestones/target dates for important activities or phases of the project, identify these dates and show actual completion dates or the percentage of completion.

Major Task 1: Prepare Research Protocol	Target date	Completion date or %
<i>Milestone Achieved: Local IRB approval at VABHS, Yale</i>	10/30/18	10/29/18
Major Task 2: Hiring and Training of Study Staff	Target date	Completion date
<i>Milestone Achieved: Research staff trained</i>	3/30/19	100%
Major Task 3: Participant Recruitment and Survey Mailing	Target date	Completion date
<i>Milestone Achieved: 1st participant returns completed survey</i>	3/30/19	2/3/20
<i>Milestone Achieved: Survey mailing completed</i>	6/30/20	5/4/20
<i>Milestone Achieved: Survey database will be cleaned, finalized, and provided to the Initiating PI</i>	9/30/20	7/30/20
Major Task 4: Interview Assessments	Target date	Completion date
<i>Milestone Achieved: all interviews completed.</i>	9/30/20	2/28/22
<i>Milestone Achieved: data collection completed.</i>	9/30/20	2/28/22
Major Task 5: Data Analysis	Target date	Completion date
<i>Milestone achieved: report prevalence of EDs.(self-report data)</i>	12/30/20	3/30/22
<i>Milestone achieved: report treatment patterns of Veterans with EDs and barriers to care.</i>	12/30/20	3/30/22
<i>Milestone: report military-specific risk/maintenance factors for EDs in Veterans.</i>	3/30/21	0%

Milestone: report validity of screening measures for EDs.	6/30/21	0%
Milestone Achieved: Report results from data analyses	9/30/21	0%

What was accomplished under these goals?

For this reporting period describe: 1) major activities; 2) specific objectives; 3) significant results or key outcomes, including major findings, developments, or conclusions (both positive and negative); and/or 4) other achievements. Include a discussion of stated goals not met. Description shall include pertinent data and graphs in sufficient detail to explain any significant results achieved. A succinct description of the methodology used shall be provided. As the project progresses to completion, the emphasis in reporting in this section should shift from reporting activities to reporting accomplishments.

Major Task 1: Prepare Research Protocol-Achieved in previous reporting period (please see below)

- Refine assessment battery: Achieved in previous reporting period -May 2020 (please see annual report October 2020).
- Pilot test survey and diagnostic interview: Achieved in previous reporting period - July 2020 (please see annual report, October 2020).
- Finalize consent form & human subjects protocol: Achieved in previous reporting period-July 2020 (please see annual report, October 2020).
- Refine and edit interview assessment protocol: Achieved in previous reporting period- May 2020 (please see annual report October 2020).

Major Task 2: Hiring and Training of Study Staff – Achieved in previous reporting period

- VA Boston staff and Yale staff have been trained for their roles on the project as detailed in Annual Report, October 2020.

Major Task 3: Participant Recruitment and Survey Mailing

- Coordinate with sites and survey research firm for all study steps and data collection methods. Achieved in previous reporting period-July 2020 (please see Annual report October 2020):

Major Task 4: Interview Assessments- COMPLETED IN THIS PERIOD

- Attempted contact at least once with 350 (of the planned 350) participants
- Attempted contact more than once with over 310 participants -Attempted contact at least 3 times. Remaining 40 participants were not needed as all male cases were matched.
- 40 direct opt outs (refused participation); 115 lost - not able to make contact after numerous attempts by phone call or text; at least 24 of which known to be incorrect/ no longer correct contact details.
- Attempted to contact all 'lost' participants by mail at least twice.
- 194 enrolled (consented)
- 168 people completed interviews. Remaining 26 enrolled but lost to further contact.
- Differential rates of "lost to contact" among groups with high rates (48%) lost among controls and the highest rate among female controls (nearly 60%) than cases (34.5%).
- Data entry and data coding complete and checked.
- Data exported and sent via secure transfer to survey firm, Westat
- Westat calculated sample weights and sent data to Dr Mitchell

Major Task 5: Data Analysis- Begun in this period

- Report the prevalence of EDs: a paper describing the prevalence (on basis of self-report data) of EDs, treatment patterns and barriers to care is in press at the *Journal of Psychosomatic Research*.
- Report treatment patterns of veterans with EDs and barriers to care: paper in press (see above)
- Analyses for other aims are underway and will be complete within the next year.

If the project was not intended to provide training and professional development opportunities or there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe opportunities for training and professional development provided to anyone who worked on the project or anyone who was involved in the activities supported by the project. “Training” activities are those in which individuals with advanced professional skills and experience assist others in attaining greater proficiency. Training activities may include, for example, courses or one-on-one work with a mentor. “Professional development” activities result in increased knowledge or skill in one’s area of expertise and may include workshops, conferences, seminars, study groups, and individual study. Include participation in conferences, workshops, and seminars not listed under major activities.

Nothing to report

How were the results disseminated to communities of interest?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe how the results were disseminated to communities of interest. Include any outreach activities that were undertaken to reach members of communities who are not usually aware of these project activities, for the purpose of enhancing public understanding and increasing interest in learning and careers in science, technology, and the humanities.

A paper on the prevalence of EDs among sexual minority veterans has been published in the *International Journal of Eating Disorders*.
A paper on the prevalence of EDs, pattern of treatment use and barriers to care is currently in press at the *Journal of Psychosomatic Research*.

Describe briefly what you plan to do during the next reporting period to accomplish the goals and objectives.

We will complete data analyses for all study aims and submit manuscripts for publication.

4. **IMPACT:** *Describe distinctive contributions, major accomplishments, innovations, successes, or any change in practice or behavior that has come about as a result of the project relative to:*

What was the impact on the development of the principal discipline(s) of the project?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe how findings, results, techniques that were developed or extended, or other products from the project made an impact or are likely to make an impact on the base of knowledge, theory, and research in the principal disciplinary field(s) of the project. Summarize using language that an intelligent lay audience can understand (Scientific American style).

We found high (self-reported) prevalence for EDs among male and female veterans and low rates of those receiving ED treatment. Findings highlight a general problem of people not receiving treatment and one that may be particularly acute for veterans. This has important implications for the allocation of resources to provide readily available, evidence-based treatment for veterans.

What was the impact on other disciplines?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe how the findings, results, or techniques that were developed or improved, or other products from the project made an impact or are likely to make an impact on other disciplines.

Nothing to report

What was the impact on technology transfer?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe ways in which the project made an impact, or is likely to make an impact, on commercial technology or public use, including:

- *transfer of results to entities in government or industry;*
- *instances where the research has led to the initiation of a start-up company; or*
- *adoption of new practices.*

Nothing to report

What was the impact on society beyond science and technology?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe how results from the project made an impact, or are likely to make an impact, beyond the bounds of science, engineering, and the academic world on areas such as:

- *improving public knowledge, attitudes, skills, and abilities;*
- *changing behavior, practices, decision making, policies (including regulatory policies), or social actions;*
or
- *improving social, economic, civic, or environmental conditions.*

As noted above, the majority of people with EDs do not receive any treatment for their ED. Even when it is available it is not always appropriate evidence-based treatment. Findings highlight a range of barriers to care such as lack of availability and the high cost of treatment and the need to improve access to high quality treatment for both the veteran and general population in the US.

- 5. CHANGES/PROBLEMS:** *The PD/PI is reminded that the recipient organization is required to obtain prior written approval from the awarding agency grants official whenever there are significant changes in the project or its direction. If not previously reported in writing, provide the following additional information or state, “Nothing to Report,” if applicable:*

Nothing to report

Actual or anticipated problems or delays and actions or plans to resolve them

Describe problems or delays encountered during the reporting period and actions or plans to resolve them.

Actual problems and delays:

We experienced delays in completing interviews as previously reported. However we were able to obtain a no cost extension and are confident that we can complete the analyses for the remaining aims within the next year.

Changes that had a significant impact on expenditures

Describe changes during the reporting period that may have had a significant impact on expenditures, for example, delays in hiring staff or favorable developments that enable meeting objectives at less cost than anticipated.

The delay in beginning the interviews, detailed in the previous annual report has had an impact on expenditure. Staff were employed for longer than anticipated prior to beginning interviews. This was due to the unanticipated shut-down at Yale due to COVID and the need to make study changes. So, although staff time was used productively to make all the necessary changes and adjustments, staff will need to be employed for longer than planned to complete the interviews. In addition, there were some extra equipment costs (e.g., monitors, a laptop, headphones, cell phone, etc. for working remotely). However, the major contributor to extra costs is the salary costs. We were able to secure funds for an extra RA for a year and received these funds in the year 2019-2020 for 8 months (\$80,000) and were granted an additional 4 months for 2020-2021. As reported, in the quarterly reports during 2020-2021, the ongoing health problems of one of the RA s and subsequent accommodation granted to them, resulted in ongoing salary costs without the appropriate corresponding rate of recruitment and high quality work. After a series of difficult negotiations and detailed efforts to improve the quality of their work in accordance with University HR policy, they volunteered for early lay off. The University and the Union agreed to waive the usual 90-day notice period, and as of July 6th 2021, they were no longer employed on the project.

It has been possible to secure a small amount of further funding to help supplement funding of the NCE to overcome some of these difficulties. The two remaining RAs completed the interviews in February 2022 and Dr Cooper exported data, prepared data dictionaries and an outline of risk factor analyses. The remaining time will be used for data analysis and preparing material for publication.

Describe significant deviations, unexpected outcomes, or changes in approved protocols for the use or care of human subjects, vertebrate animals, biohazards, and/or select agents during the reporting period. If required, were these changes approved by the applicable institution committee (or equivalent) and reported to the agency? Also specify the applicable Institutional Review Board/Institutional Animal Care and Use Committee approval dates.

Significant changes in use or care of human subjects

1. Continuing Review VA Boston IRB and HRPO review (5/17/21, 5/27/21) -VA Boston requires continuing review every two years for this study
2. Continuing Review Yale IRB 6/6/2022 – note CR no longer required
3. HRPO review (Yale) 7/13/2022

Significant changes in use of biohazards and/or select agents

Nothing to report

6. PRODUCTS: List any products resulting from the project during the reporting period. If there is nothing to report under a particular item, state “Nothing to Report.”

- **Publications, conference papers, and presentations**

Report only the major publication(s) resulting from the work under this award.

Journal publications. List peer-reviewed articles or papers appearing in scientific, technical, or professional journals. Identify for each publication: Author(s); title; journal; volume; year; page numbers; status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).

Serier, K., Smith, B., Cooper, Z., Vogt, D., & Mitchell., K.S. Disordered eating in sexual minority post-9/11 female veterans. *International Journal of Eating Disorders*:2022;55 (4), 470-480.

Mitchell, K.S., Sienkiewicz, M., Smith, B.N., Vogt, D., Kehle-Forbes, S., & Cooper, Z. (in press). Associations between eating disorders and healthcare use among male and female post-9/11 veterans. *Journal of Psychosomatic Research*. <https://doi.org/10.1016/j.jpsychores.2022.110811>

Books or other non-periodical, one-time publications. Report any book, monograph, dissertation, abstract, or the like published as or in a separate publication, rather than a periodical or series. Include

any significant publication in the proceedings of a one-time conference or in the report of a one-time study, commission, or the like. Identify for each one-time publication: author(s); title; editor; title of collection, if applicable; bibliographic information; year; type of publication (e.g., book, thesis or dissertation); status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).

Nothing to report

Other publications, conference papers and presentations. Identify any other publications, conference papers and/or presentations not reported above. Specify the status of the publication as noted above. List presentations made during the last year (international, national, local societies, military meetings, etc.). Use an asterisk (*) if presentation produced a manuscript.

Nothing to report

- **Website(s) or other Internet site(s)**

List the URL for any Internet site(s) that disseminates the results of the research activities. A short description of each site should be provided. It is not necessary to include the publications already specified above in this section.

Nothing to report

- **Technologies or techniques**

Identify technologies or techniques that resulted from the research activities. Describe the technologies or techniques were shared.

Nothing to report

- **Inventions, patent applications, and/or licenses**

Identify inventions, patent applications with date, and/or licenses that have resulted from the research. Submission of this information as part of an interim research performance progress report is not a substitute for any other invention reporting required under the terms and conditions of an award.

Nothing to report

- **Other Products**

Identify any other reportable outcomes that were developed under this project. Reportable outcomes are defined as a research result that is or relates to a product, scientific advance, or research tool that makes

a meaningful contribution toward the understanding, prevention, diagnosis, prognosis, treatment and /or rehabilitation of a disease, injury or condition, or to improve the quality of life. Examples include:

- *data or databases;*
- *physical collections;*
- *audio or video products;*
- *software;*
- *models;*
- *educational aids or curricula;*
- *instruments or equipment;*
- *research material (e.g., Germplasm; cell lines, DNA probes, animal models);*
- *clinical interventions;*
- *new business creation; and*
- *other.*

Nothing to report

7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

What individuals have worked on the project?

Provide the following information for: (1) PDs/PIs; and (2) each person who has worked at least one person month per year on the project during the reporting period, regardless of the source of compensation (a person month equals approximately 160 hours of effort). If information is unchanged from a previous submission, provide the name only and indicate "no change".

Name: Karen Mitchell
 Project role: Initiating PI
 Researcher Identifier: 0000-0002-1516-7239- No Change

Name: Megan Sienkiewicz
 Project role: Research Assistant
 Nearest person month worked: .75
 Contribution to the project: Ms. Sienkiwicz has assisted with survey refinement, IRB amendments, and literature searches, and preparation of manuscripts.

Name: Zafra Cooper
 Project role: Partnering PI
 Researcher Identifier: 0000-0001-7963-656X

Nearest person month worked: 2.4
 Contribution to the project:

Dr. Cooper has worked to supervise and manage the Yale research staff. She met twice weekly with the 2 remaining research assistants to review all interviews conducted until completion of interviews at the end of February 2022. She has worked to export the data and transfer it securely to Westat and provide data dictionaries and guidance with Dr Mitchell for the agreed analyses for the remaining study aims.

Name: Julianne Dorset

Project role: Research Assistant

Nearest person month worked: 5

Contribution to the project: Julianne Dorset worked full time until end of February 2022. She recruited and interviewed participants, and, especially had a particular role in following up and recruiting participants who are difficult to contact and engage. She also assisted with continuing IRB review submissions and produced agendas for our twice weekly meetings.

Name: Erin Healey

Project role: Research Assistant

Nearest person month worked: 5

Contribution to the project: Erin Healey worked full time until the end of February 2022. She continued to make any programming changes and amendments required and maintained our detailed recruitment figures. She also had a major role in recruiting and interviewing participants.

Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

If the active support has changed for the PD/PI(s) or senior/key personnel, then describe what the change has been. Changes may occur, for example, if a previously active grant has closed and/or if a previously pending grant is now active. Annotate this information so it is clear what has changed from the previous submission. Submission of other support information is not necessary for pending changes or for changes in the level of effort for active support reported previously. The awarding agency may require prior written approval if a change in active other support significantly impacts the effort on the project that is the subject of the project report.

Nothing to report

What other organizations were involved as partners?

If there is nothing significant to report during this reporting period, state “Nothing to Report.”

Describe partner organizations – academic institutions, other nonprofits, industrial or commercial firms, state or local governments, schools or school systems, or other organizations (foreign or domestic) – that were involved with the project. Partner organizations may have provided financial or in-kind support, supplied facilities or equipment, collaborated in the research, exchanged personnel, or otherwise contributed.

Provide the following information for each partnership:

Organization Name:

Location of Organization: (if foreign location list country)

Partner’s contribution to the project (identify one or more)

- *Financial support;*
- *In-kind support (e.g., partner makes software, computers, equipment, etc., available to project staff);*
- *Facilities (e.g., project staff use the partner’s facilities for project activities);*
- *Collaboration (e.g., partner’s staff work with project staff on the project);*
- *Personnel exchanges (e.g., project staff and/or partner’s staff use each other’s facilities, work at each other’s site); and*
- *Other.*

Minneapolis VA Healthcare System
1 Veterans Drive CCDOR(152)
Minneapolis, MN 55417

Contribution: facilities and collaboration

8. SPECIAL REPORTING REQUIREMENTS

COLLABORATIVE AWARDS: *For collaborative awards, independent reports are required from BOTH the Initiating Principal Investigator (PI) and the Collaborating/Partnering PI. A duplicative report is acceptable; however, tasks shall be clearly marked with the responsible PI and research site. A report shall be submitted to <https://ers.amedd.army.mil> for each unique award.*

QUAD CHARTS: *If applicable, the Quad Chart (available on <https://www.usamraa.army.mil>) should be updated and submitted with attachments.*

Please see attached quad chart

9. **APPENDICES:** *Attach all appendices that contain information that supplements, clarifies or supports the text. Examples include original copies of journal articles, reprints of manuscripts and abstracts, a curriculum vitae, patent applications, study questionnaires, and surveys, etc.*

Please see attached papers