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**TITLE:** Veterans with Gulf War Illness: Understanding the Spectrum of Experiences Related to Aging and Demographics

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**1. INTRODUCTION:**

This systematic qualitative research project seeks to learn about the individual and unique experiences of Veterans with Gulf War Illness (GWI) including perceptions of the impact of their illness, quality of care, barriers faced, and impact on interpersonal relationships and quality of life (Aim 1). The differences in experiences across demographic characteristics such as gender, race/ethnicity, and type of exposure, as well as experiences related to aging are of particular interest. Furthermore, perceptions and experiences of health care providers of Veterans with GWI are gathered (Aim 2). The final aim (Aim 3) is to prepare an up-to-date curriculum that can be presented through a massive open online course. Overall, 40 Veterans and 10 health care providers will be interviewed. Collage portraits of experiences with GWI will also be collected from Veterans.

**2. KEYWORDS:**

Gulf War Illness, Veteran experiences, Health care provider experiences, Qualitative Study, Grounded Theory, Perceptions, Barriers, Collage portraits

**3. ACCOMPLISHMENTS:**

**What were the major goals of the project?**

MONTHS	MAIN PROJECT MILESTONES <u>SPECIFIC AIM 1 &amp; AIM 2</u>	ACCOMPLISHED
	<b>Task 1: Hiring, regulatory compliance, and reporting</b>	
1 – 3	Develop job description, hire project coordinator	yes
1 – 6	Coordinate with DU for material transfer agreements	yes
1 – 3	Submit IRB documents for Aim 1 and Aim 2	yes
Annual	Coordinate with sites for annual IRB report	yes
4 – 6	Receive IRB approval through CTVHCS and DU	yes
3 – 6	Visit CoE to train data collector in interview protocol	yes
3 – 6	Schedule weekly e-mail check-ins and monthly conference calls	yes
6	Train research staff	yes
	<b>Task 2: Recruit and enroll Veterans and begin data collection</b>	
6 – 8	Review literature and summarize demographics	yes
4 – 6	Conduct 2 interviews with PC and PI to ensure consistency	yes
4 – 6	First two veterans with GWI consented, screened and enrolled in study	yes
4 – 6	Complete transcription of the first two Veteran interviews	yes

<b>MONTHS</b>	<b>MAIN PROJECT MILESTONES</b>	<b>ACCOMPLISHED</b>
4 – 6	Set up of de-identified database on Dedoose	yes
4 – 8	Begin recruitment of healthcare providers (HCP)	yes
4 – 8	Conduct first interviews with healthcare provider	yes
4 – 8	Complete transcription of the first interview of healthcare provider	yes
5 – 7	First healthcare provider consented, screened and enrolled First transcript transcribed and entered into database	yes yes
<b>Task 3: Continue data collection and data analysis</b>		
6 – 23	Continued data collection for Aim 1 (veteran experiences)	52% complete (21/40)
	Continued data collection for Aim 2 (HCP experiences)	yes
8 – 24	Continue additions to de-identified database for both aims	yes
8 – 24	Continue to upload de-identified transcripts and images	yes
8 – 24	Refine coding scheme and begin coding	yes
12 – 24	Review coding and analysis with secondary coder	Veteran data: no Health care providers: yes
14 – 24	Complete axial and selective coding	Veteran data: no Health care providers: yes
18 – 24	Identify themes and grounded theory framework; review findings with research team	Veteran data: no Health care providers: yes
<b>SPECIFIC AIM 3</b>		
<b>Task 4: Create MOOC, disseminate findings and prepare final reports</b>		
24 – 25	Create template for unit readings, course content, etc.	yes
24 – 25	Coordinate subject matter experts to create curriculum Units including course content, lectures, Powerpoint Slides, assignments and assessments	yes
24 – 30	Create unit with lay summaries, Veterans' perspectives and art work on experiences with GWI	yes
25 – 30	Create course content and review for consistency; ensure that the literature is current and includes most recent research on GWI; gather feedback	yes
33 – 36	Complete the MOOC course content and curriculum and submit to funder	no
33 – 36	Submit manuscripts for dissemination and prepare final reports for project	2 manuscripts submitted

**What was accomplished under these goals?**

**1. Major activities:**

The major activities during this reporting period included

- writing and publishing a graphic elicitation paper about already collected veteran’s (14) collage and art responses in a special GWI issue (Life Sciences) and developing. Data collection entailed both interview responses as well as collage portraits/graphic responses about veteran experiences with GWI (Aim 1). For this paper, the focus was on the graphic responses of the veterans.
- coming close to completing the content for a MOOC (Aim 3). Three of four units were completed and the third unit will be completed once data analysis of the remaining veterans has taken place.

From before the beginning of this report period through July 2021, recruitment of veterans was at a complete standstill with only 14 veterans having completed the study at the previous site in Waco, TX (before the beginning of the COVID-19 pandemic). Since August 2021, seven more participants have completed the study at the new site in Colorado and eight more are in the process of being scheduled.

**2. Specific objectives**

The specific objectives during this reporting period included (1) analyzing collage data and submitting a manuscript for dissemination of results, (2) developing and completing 3 units for MOOC, (3) recruiting and enrolling veterans to complete data collection

**3. Significant results/key outcomes**

Collage-based graphic elicitation publication

**4. Other achievements**

n/a

**5. Goals not met**

Data collection and analysis of 19 Veterans’ interviews. During this reporting period the main challenge continued to be the public health emergency due to the coronavirus and delays in IRB approval. The study was able to recommence in Denver, CO in August, however it took more than a year for data collection to continue.

**What opportunities for training and professional development has the project provided?**

**Professional development:** This project provided an opportunity for professional development for doctoral student Bani Malhotra and post-doctoral researchers Rebekka Dieterich-Hartwell as they analyzed the graphic responses from the existing veteran data (15 participants) and engaged in the mentored process of developing a MOOC.

**Future opportunities:** It is expected that the findings from this study will continue to be disseminated at conferences and/or workshops related to qualitative research and military health care.

#### **How were the results disseminated to communities of interest?**

Nothing to report

#### **What do you plan to do during the next reporting period to accomplish the goals?**

During the next and final reporting period we plan to complete data collection and data analysis for Aim 2 (Gulf War Veterans), disseminate the results to communities of interest, present the results at conferences and workshops, and submit for publications. We also plan to widely disseminate the MOOC curriculum content modules (on Drexel website) to health care

#### **4. IMPACT:**

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

This study is one of the first to examine the lived experiences of Veterans with GWI and their needs as they encounter the aging process. The findings from this study are likely to make an impact on the base of knowledge, theory, and research by advancing patient care through educating health care providers about the unique needs of this population. The educational materials (including patient narratives) are expected to reduce the unique barriers to care faced by this group of Veterans. The MOOC curriculum content modules (Aim 3), will help identify practices healthcare providers need to adapt to, in order to better serve patient needs.

### **What was the impact on other disciplines?**

Both the discipline of military health, military medicine, qualitative research and art therapy as well as other disciplines are likely to be impacted by the findings of this study.

### **What was the impact on technology transfer?**

The MOOC (massive online open course) curriculum content modules will be shared with civilian physicians.

### **What was the impact on society beyond science and technology?**

The findings from this study are likely to make an impact on society by improving the attitudes towards gulf war illness by helping clinicians become more empathic care providers and reducing the barriers to care faced by Veterans with GWI, thus ultimately advancing patient care.

## **5. CHANGES/PROBLEMS:**

### **Changes in approach and reasons for change**

Dr. DeBeer's transfer to the University of Colorado and the subsequent requirement for approval from the VA IRB entailed several rounds of review for approval (2 separate committees and a co-institutional IRB). In addition, the global coronavirus pandemic forced this study to become remote, a first for this type of study. These changes and obstacles resulted in a delay in the continuation of this study. However, in August of 2021, recruitment recommenced, and the project is well underway and expected to complete on time.

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

The delays in the IRB submission process to the University of Colorado school of Medicine were outside of our control as was the delay due to the coronavirus pandemic. However, the delays should not interfere with the goals in the next reporting period, and the study should complete by March 2022.

**Changes that had a significant impact on expenditures**

Nothing to report

**Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents**

**Significant changes in use or care of human subjects**

Nothing to report

**Significant changes in use or care of vertebrate animals.**

Nothing to report

**Significant changes in use of biohazards and/or select agents**

Nothing to report

**6. PRODUCTS:**

- **Publications, conference papers, and presentations**
- **Journal publications.**

Malhotra, B., Dieterich-Hartwell, R., DeBeer, B., Burns, C., & Kaimal, G. (2021). Collage-based graphic elicitation method for capturing the lived experiences of veterans with Gulf War illness. *Life Sciences*, 119656. <https://doi.org/10.1016/j.lfs.2021.119656>

- **Books or other non-periodical, one-time publications.**

Nothing to report

- **Other publications, conference papers, and presentations.**

Malhotra, B., Dieterich-Hartwell, R.M., DeBeer, B., Burns, C. & Kaimal, G. (2021). Collage-based Graphic Elicitation Method for Capturing the Lived Experiences of Veterans with Gulf War Illness. *Life Sciences*. <https://doi.org/10.1016/j.lfs.2021.119656> (Impact Factor =3.6)

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

The MOOC Curriculum content modules (pending approval) will be uploaded and included on a Drexel CHP website tbd.

- **Technologies or techniques**

Nothing to report

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

Nothing to report

- **Other Products**

The MOOC curriculum content modules (4 PowerPoint presentations with word documents to go along) are being finalized. Of note is that 3 units are complete, however, unit 3 (data on Gulf War Illness veterans – interviews will be completed once data collection and analysis has taken place)

## **7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS**

**What individuals have worked on the project?**

*Name:* Girija Kaimal, EdD, ATR-BC  
*Project role:* Principal Investigator  
*Researcher identifier (Orcid ID):* 0000-0002-7316-0473  
*Nearest month person worked:* 1.8 months

*Name:* Bryann de Beer, PhD  
*Project role:* Site Principal Investigator  
*Nearest month person worked:* 2 months

*Name:* Rebekka Dieterich-Hartwell, PhD, BC-DMT  
*Project role:* Postdoctoral research fellow  
*Research identifier (Orcid ID):* 0000-0002-9788-7140  
*Nearest month person worked:* 6 months

*Name:* Bani Malhotra, MA, ATR-BC  
*Project role:* Research assistant  
*Nearest month person worked:* 1.5 months

*Name:* Tabitha Alverio, MA  
*Project role:* Site coordinator  
*Nearest month person worked:* 2 months

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

Nothing to report

**What other organizations were involved as partners?**

Nothing to report

**8. SPECIAL REPORTING REQUIREMENTS**

**COLLABORATIVE AWARDS:**

**QUAD CHARTS:**

## **9. APPENDICES:**

The open access publication from this year is included.



Contents lists available at ScienceDirect

Life Sciences

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## Collage-based graphic elicitation method for capturing the lived experiences of veterans with Gulf War illness

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### ARTICLE INFO

#### Keywords:

Graphic elicitation  
Gulf war illness  
Qualitative research  
Collage artmaking  
Veterans  
Interviews

### ABSTRACT

**Aims:** Graphic elicitation is an emergent data gathering approach in qualitative research. An overview of the development and application of a collage based graphic elicitation method in gaining greater understanding about the experience of Gulf War Illness (GWI) is presented in this paper. The unique contributions of this method are also discussed.

**Main methods:** Fourteen veterans with GWI were interviewed and then invited to represent their experiences in a visual format through a collage graphic elicitation task. Interviews and collage artworks were coded and compared to both verbal and art responses during the graphic elicitation process.

**Key findings:** Comparison of the content in the interview responses and collage artwork indicates that the graphic elicitation process resulted in three distinct responses: (1) Synthesis and confirmation of content articulated in the interviews, (2) focus on salient aspects of living with GWI, and (3) revealing previously unarticulated experiences.

**Significance:** This work demonstrates the unique contributions of collage graphic elicitation, including allowing for spontaneity, metaphorical thinking, enriching verbal explication, and uncovering lived experiences and new affective responses. The sample size was too small to make any generalizations, and more research is needed to further validate these initial findings.

## 1. Introduction

### 1.1. Gulf War illness

Gulf war illness (GWI) is a multi-symptom condition that was first noticed when veterans, deployed in Operation Desert Shield and Operation Desert Storm, returned from the Persian Gulf in early 1991 [1]. While in this theater of war, service members were commonly exposed to fumes of oil well fires, pesticides, and other toxins [2,3]. Shortly after returning, about 30% of the 700,000 deployed US Gulf War veterans began to report unexplained symptoms. These included pain, fatigue, respiratory difficulties, gastrointestinal issues, memory and cognitive problems, and interpersonal conflicts [4]. Throughout the following years, no clear medical recognition of GWI was established, leaving

veterans feeling invalidated and frustrated [5] and making the illness challenging for healthcare providers to treat effectively [6]. More recently, two official case definitions for GWI have received endorsement by the National Academy of Medicine for use in both clinical diagnosis and research, the CDC (Centers for Disease Control and Prevention) chronic multi-symptom illness and the Kansas GWI definition [7]. According to the CDC definition, GWI is diagnosed when one or more symptoms are present for at least 6 months in two of three categories: fatigue, musculoskeletal pain, and mood/cognition [8]. The more specific Kansas definition identifies GWI in those who report moderate levels in at least three out of six symptom categories in the year before the assessment: fatigue/sleep, pain, neurological/cognitive/mood, gastrointestinal, respiratory and skin issues [9]. Today, over 200,000 veterans continue to be affected by the chronic symptoms of

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GWI [2].

### 1.2. Collage as graphic elicitation

Art therapy is a human services profession, provided by a master's level trained professional who uses the creative process, art making, and applied psychological theory within a therapeutic relationship to improve mental health and wellbeing of persons and families [10]. Art therapy is increasingly being accepted as part as integrative and clinical care for veterans [11]. The images created in art therapy become tools to address issues of identity, process feelings of guilt, grief, and loss, and communicate inner experiences difficult to put into words [12]. The use of visual images in research is referred to as *graphic elicitation techniques (GETs)*, *diagramming* or *drawing* [13]. GETs can integrate both text and images [14] in an iterative process, which may open up previously unconsidered notions [15]. GETs have been used to explore complex research topics to overcome cultural and linguistic barriers [13] in the fields of education [16]; nursing and healthcare [17]; psychology, and sociology [14].

The use of collage as graphic elicitation is scarce but slowly gaining popularity in arts-based research [18,19]. Collage art is created by use of magazine or newspaper cut outs and textured papers through arrangement on a blank canvas or paper. Art therapists utilize collage in therapy as a psychologically safe and structured art media which may be less intimidating than drawing or painting [20,21].

In this paper, we present the contributions of using collage as a graphic elicitation method, informed by art therapy practice, to facilitate deeper understanding of GWI compared with the use of verbal interviews alone. The focus of this article is on the development and structure of using GETs as a qualitative research method in the context of trained therapeutic support during the use of art media.

## 2. Materials and methods

### 2.1. Study approach/study design

For this study, a qualitative thematic approach to better understand and delineate the contributions of graphic elicitation in representing the experiences of GWI was used [22,23]. The protocol was approved by the facility IRB prior to the start of the study.

### 2.2. Study population

Participants were recruited from the Gulf War Registry (GWR), which includes Veterans who were deployed in the region of Southwest Asia (Iraq, Kuwait, Saudi Arabia, Bahrain, Qatar, the United Arab Emirates, Man, the Gulf of Aden, the Gulf of Oman, the waters of the Persian Gulf, the Arabian Sea, and the Red Sea; Veterans Health Administration, 2017) at the time of the Persian Gulf War (1990–1991). In order to be included in the GWR, Veterans were screened through a medical examination that reviews their symptoms, using both the CDC and Kansas definitions of GWI. Recruitment took place through targeted mailings and outreach to individuals already enrolled in other research studies of GWI. Fourteen participants took part in a semi-structured 1:1 interview, followed by a graphic elicitation task using art and collage materials. Nine participants were male, five were female. See Table 1 for demographic information.

### 2.3. Setting

The study took place at an established Veteran's healthcare and research facility in Southern United States.

### 2.4. Data collection

All participants were pre-screened for study eligibility. Once initial

**Table 1**  
Veteran demographics ( $n = 14$ ).

Demographics	Mean (SD)	N (%)
Age	55.29 (5.06)	
Gender	Female	5 (35.71%)
	Male	9 (64.28%)
Race	White	7 (50.00%)
	Black or African-American	6 (42.86%)
	Multi-racial	1 (7.14%)
	Asian/Pacific Islander	0 (0.00%)
	American Indian or Alaskan Native	0 (0.00%)
Ethnicity	Hispanic or Latino	2 (14.28%)
	Non-Hispanic/Latino	12 (85.71%)
Marital Status	Never married	0 (0.00%)
	Living together	1 (7.14%)
	Married	13 (92.86%)
	Separated	0 (0.00%)
	Divorced	0 (0.00%)
	Widowed	0 (0.00%)
Education	Less than high school	0 (0.00%)
	Graduated high school	4 (28.57%)
	Trade or certificate program	2 (14.28%)
	Undergraduate degree	6 (42.86%)
	Other	2 (14.28%)
Employment Status (categories not mutually exclusive)	Employed full time	7 (50.00%)
	Employed part time	1 (7.14%)
	Unemployed	0 (0.00%)
	Retired	4 (28.57%)
	Disabled	3 (21.48%)
	Full time student	0 (0.00%)
	Full time homemaker	0 (0.00%)
	Other	0 (0.00%)

eligibility was confirmed, participants were scheduled for an in-person appointment where they provided informed consent, and final eligibility was confirmed. The participants were interviewed by a research assistant on site and also filled out a demographic questionnaire. The research assistant was trained in conducting the semi-structured 1:1 interview for this study by the project director and site principal investigator. As part of the training for the interview and graphic elicitation, guidelines were provided on how to build rapport with the participants, invite authentic sharing of their experiences while ensuring and protecting confidentiality. Training was also provided on how to introduce the art materials and facilitate the graphic elicitation session while also monitoring the participants for any distress that might arise from the emotional aspects of self-expression. Ongoing support was ensured through the services available at the site and the supervision of a licensed clinical psychologist (BD) during the study.

The interviews and collage elicitation both combined lasted between 45 and 90 min. The verbal interview included questions about the Veterans' experiences, such as "Do you remember what toxins you were exposed to?", "What are some of the symptoms you are experiencing?", "Have your symptoms changed over time?", "How have GWI symptoms affected your relationships/your work/your life?" "What kind of medical care have you received?" "Has anything been particularly helpful or unhelpful in the healthcare received?", "Are there any barriers that you have encountered?", "What kinds of support and resources do you have?", "What kinds of support and resources would you like to see offered?"

Once the interview was completed, participants were offered the opportunity to represent their experiences with GWI in a visual format. They were presented with materials for making collage, including pre-cut magazine collage images, word cut outs, textured paper, paper shapes, glue sticks, pencils, oil pastels, colored pencils, and markers. The veterans had a choice to select a canvas or smaller sized paper as the base for collage artmaking. Sometimes the participants worked on more than

one canvas. The script for the collage was part of the interview process and included the following content: Participants were invited to create a collage that represents any aspect of their experiences with GWI. There were no expectations around artistry; rather participants were told that it is an additional way to represent their experiences and that there were no right or wrong way to do the collage. Participants were asked to share a brief narrative describing the contents of the collage and any impressions they would like to share about the experience. Once the collage was completed, with participant consent, the collage was photographed. Participants had the choice to keep the collage or to give it to the researcher as part of the study. The whole experience took between 30 and 45 min.

The graphic elicitation (GE) process took between 10 and 45 min with an average of 21 min per person. The interviews and art elicitation responses were recorded on an encrypted device and transcribed. The artwork was de-identified and photographed on an encrypted device. Participants received \$40 for their time.

### 2.5. Data analysis

The transcribed de-identified interviews and collage artwork were entered into Dedoose, a web-based application that facilitates data management and analysis. Data analysis of the interviews and the verbal responses to the graphic elicitation process occurred through the following steps: (1) preparation and cleaning of data, (2) development of comprehensive coding schemes, (3) coding of transcripts by several coders, ensuring inter-coder agreement, (4) identification of themes.

The responses to the collage GE task were analyzed and compared by two separate coders, one who had immersed herself with the interview transcripts first, the other who had looked at the art responses first. This approach was used to minimize bias and identify consistent and recurring patterns in the data.

When agreement had been established, the two coders created a matrix with the predominant codes for each participant interview and the findings from each graphic elicitation process, along with a review of the artwork for the content and art media use. The use of space, color, additional media, picture organization, visual metaphors, and symbols were also noted in the artwork made by the participants. In addition, the GE response was coded for references to resources, strengths, concerns, and challenges mentioned or depicted by the veterans; or both. The interview responses were then compared to the GE responses in order to learn about the specific effects of the art elicitation. The coders noted any similarities and differences, salient observations and special contributions of the GE responses. When agreement had been established, the two coders created a matrix with the predominant codes for each participant interview and the findings from each graphic elicitation process, along with a review of the artwork for the content and art media use.

## 3. Results

The collage elicitation task during the interview allowed veterans to go beyond the verbal descriptions and share additional depictions of their experiences. Some participants added dimensions to their experiences through the use of visual metaphors, while others used literal representations integrating their experiences or focusing on one aspect. Based on the comparisons between interview responses and GEs, as well as verbalizations during the GE process, we found three distinct contributions of the art elicitation process: (1) Synthesis and confirmation of themes, (2) Focus on salient aspects of living with GWI, (3) Revealing of previously unarticulated experiences.

1) Synthesis and confirmation of themes. Five veterans employed collage elicitation to synthesize their experiences in a visual form. The artistic representation in the collage mirrored and presented a visual snapshot of what was shared during the interview. The visual portrayals mapped on to the experiences verbalized during the interview. As an

example, a male veteran during collage elicitation expressed his desire to be a part of the help and solutions, and to help American families “to figure out what can be done better.” While describing his collage, the veteran shared his future self-image - his hope of being a father while also expressing his concerns and challenges:

*“The isolationism of being kind of out there on your own with the health care system, the burning leg... muscle cramp... Not only the hopelessness but also the being out there on an island... you get what’s kind of given to you and you kind of deal with it. The stress you know, am I going to be able to get up and go to work today, am I not going to be able to get up, you know, and spend time with my family, and the disease is with the multitude of ailments that you know, I feel are a result of the Gulf War and America.”*

As can be seen in Fig. 1, the veteran used collage synthesis to represent various experiences of the Gulf War, including their perceived causes of GWI; their struggles of lack of support and enduring GWI symptoms through medicine labels; and their sense of identity as a patriotic veteran through images of the American flag and men in military uniforms.

Another male veteran used two canvases (Fig. 2) and expressed similar themes in the GE response as in the interview. These included feelings of pride about being a veteran, the various experiences of the Gulf War and the toxic exposures, medicine labels representing GWI symptoms, and gratitude for the support of healthcare providers and significant others.

2) Salient aspects of living with GWI. The collage artworks of six veterans focused on the salience on a specific theme or topic from amongst all the content that was shared during the interview. The veterans used collage imagery and visual metaphors to represent the struggles of GWI. Imagery emerged in the form of self-portraits, specific struggles of female veterans with GWI, or a focus only on the medication for pain control, with a few others going into specific details of the Gulf War experiences on the field. In particular, it was noted that for one veteran the focus of the collage completely shifted from a negative focus on poor experiences with healthcare, GWI symptoms and consequences, to one of positive association with his military identity. Similarly, another veteran discussed a range of experiences in her interview but chose to focus on her feelings of anger, sadness, and challenges of being a female Gulf war veteran (Fig. 3):

*“So this is my experience: there’s no support, no aftercare after coming back, and there was just myself and one other female in my unit all men, that deployed in desert storm, so they had the upper hand we had to be one of the boys and be strong, just be strong... Yeah this is me, kind of in the dark with what was going on, stayed in the shadows and not knowing what’s going on with me why am I feeling this ways, uninformed, and the code was ‘stay silent and fight’ to protect the flag... and I’m not a whole person so like a skeleton person”*

Similarly, a female veteran expressed the particular struggles of feeling unsupported, lonely and lost, while hoping to reach the stage of feeling good about herself again (Fig. 4)-

*“After I got out, I felt like I was lost in fire and didn’t have no, no support, after we got out you know, came back to the States they left us, you know we were by ourselves and didn’t know what to, who to turn to, who to talk to, so I felt lonely and I thought that the fire would represent that... I want to be back to this point to where I can smile and feel good about myself.”*

3) Revealing previously unarticulated experiences: Five veterans created visual representations which revealed an additional aspect of their experiences that were not articulated in the verbal interviews. These dimensions included references to mental states and emotions such confusion, uncertainty, or invisibility; a reflection on a spiritual component while serving in Gulf War; expressing a desire for natural

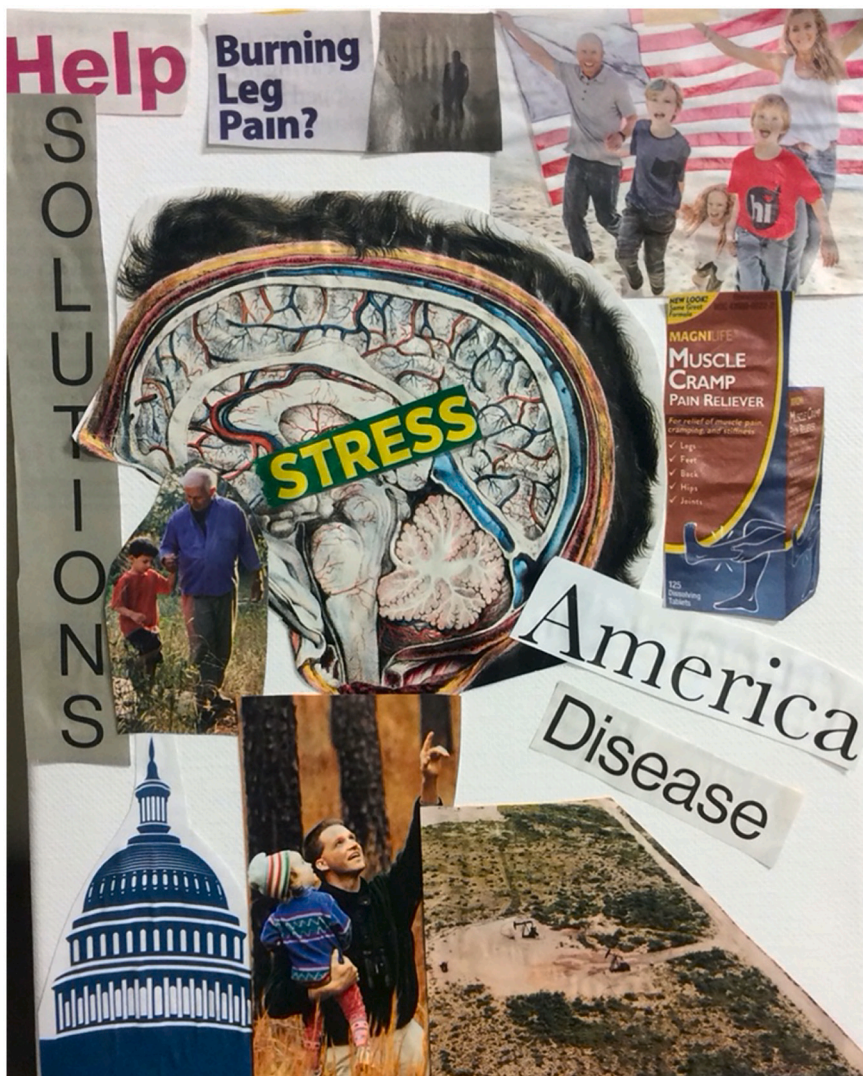


Fig. 1. Collage of a veteran describing a visual synthesis of the range of their experiences with GWI.



Fig. 2. Two collages by a veteran representing a confirmation of themes shared during the interview.

medicines and ways of help; a shift to focus on the self from the general comments on Gulf War experiences; or the visual acknowledgement of coping skills not otherwise mentioned during the interview. For example, a veteran represented her desire to be heard through her

collage while adding additional information to the interview describing her hope for natural remedies and motivation to live after expressing feeling sad and welling up with tears during the interview (Fig. 5):

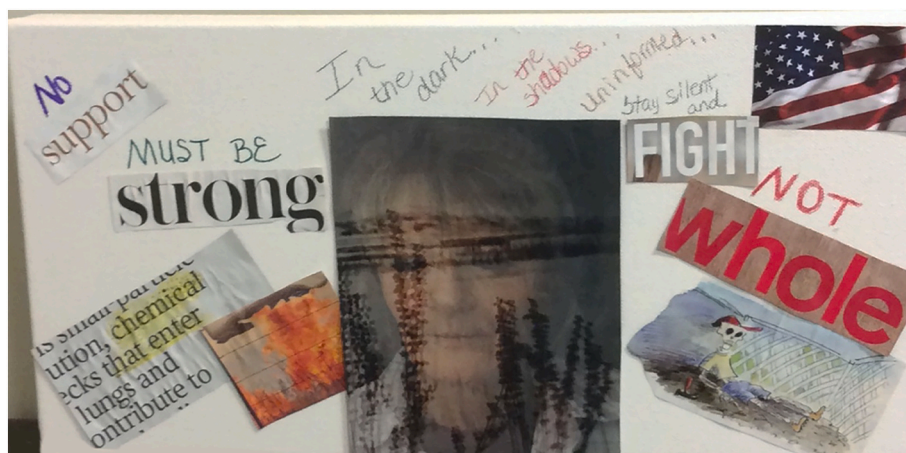


Fig. 3. Collage by a veteran describing the most salient aspects of living with GWI.



Fig. 4. Collage by a female veteran describing the particular struggles of feeling "lost in fire".

"Just see me hear me, I like anything natural, I love my family, my granddaughter, dogs, flowers... I have migraines a lot, and just stop the pain now, and living... I want to keep on living."

Another male veteran represented and talked about hobbies he enjoys during GE that weren't mentioned during the interview. These included working in the yard and working on cars and home improvements despite the chronic pain in his hand (Fig. 6).

Overall, on comparing the references to sources of strength and coping skills with challenges and concerns amongst male and female veterans, it was noted that in our sample, the men tended to create more balanced images representing imagery about Gulf War experiences, symptoms, concerns and challenges, along with supports, coping strategies, and strengths ( $n = 5$ ), with two male veterans conveying primarily strengths and two primarily focusing on challenges and concerns. The collages created by female veterans on the other hand tended to be more focused on challenges ( $n = 4$ ) concerning negative self-image and lack of support, with only one female veteran depicting positive imagery which represented supports.

#### 4. Discussion

The purpose of this paper was to understand the particular contributions of using a collage-based graphic elicitation method to facilitate understanding of veterans' lived experiences of GWI. The veterans were invited to express any aspects of GWI through the collage artwork. This led to individualized responses including personal experiences and struggles during the war, individual GWI symptoms, specific emotions, as well as coping or supportive resources not conveyed during the interview.

The representation of the experiences through a visual synthesis reflected salient aspects of the interview. This included resources of strength and coping skills as well as challenges and concerns - which encouraged a holistic and integrated narration of the self [14]. This was particularly informative in terms of the complexity of the lived experiences of Gulf War veterans. Through the comparison of the interviews and the graphic elicitation, an awareness of relationships and patterns amongst different aspects of veteran identity emerged. It appeared to



development emerged as an expression of important or difficult issues that resulted as a visual reminder which was taken home [27].

The collage elicitation method was informed by the discipline of art therapy in that it utilized a safe and structured medium that minimized the risk for participants. It offered a space for authentic expression and opportunities for externalization of the visual and tactile memories and experiences [28]. This study was conceptualized by a Board-Certified art therapist (GK) with the awareness that art making can evoke emotional responses. It is important to note that any use of art materials must be in the context of trained therapeutic support. This study involved training of the research assistant in facilitating the use of art materials for data collection, as well as ongoing support through the presence of a clinical psychologist on site. Unlike drawing which tends to evoke feelings of artistic limitations, collage allows for a sense of accomplishment in visual self-expression independent of skill levels. In this way, it allowed containment of potentially overwhelming emotions related to memories and experiences of deployment [29] including expression of unique vulnerabilities, especially by women veterans. The challenges and concerns expressed by female veterans further adds insight into qualitative differences in the experiences of gender regarding GWI, an area requiring more research [30]. Men and women might have different physical and psychological needs; and personalizing care that addresses all aspects of veteran needs would be an important consideration for future studies with GWI veterans.

#### 4.1. Implications and recommendations for future research

The use of collage in qualitative research can serve as a snapshot of experience or as a helpful starting point, depending on the particular research question at hand. It has also been suggested that “a collage can operate as a contextualizing strategy, emulating memoing in ways that open up the data further and permit insights and a deeper understanding of what is transpiring” [[24], p. 16]. In the data analysis stage, researchers may use collage graphic elicitation to conceptualize a theoretical construct, rearrange the data and discover connections, as a visual fieldnote, or even as a member check for participants to represent and disseminate findings [18]. This study utilized a scripted prompt for collage elicitation to explore veterans’ experiences with GWI after they had completed a verbal interview. In future studies, researchers could consider the timing of the art task and offer it earlier to elicit topic-specific information or explore specific responses in greater depth and detail. An art therapy practice-informed decision in this study was the availability of different sizes of canvas or paper. Offering the right size offers the right opportunity for containment of expressions. Moreover, this research study incorporated collage elicitation individually; further research is also needed to determine the role of interview format- individual or focus group - on the use of collage elicitation and how this process may need to be modified or adapted as per the specific format.

#### 4.2. Limitations

The data for the study were collected by a research collaborator trained by the senior author. Thus, all analysis was based on transcripts and images shared by the data collector on site and careful efforts were made not to overinterpret veterans’ descriptions of the collage images. All veteran participants were enrolled in VA healthcare. Thus, it is not clear whether these results are generalizable to veterans who do not receive VA healthcare. Future research could look at the process of collage construction by participants’ choice of images and composition/design elements to further capture information regarding the participants’ process. In this study, it was ensured that if the participant was distressed during the interview process, ongoing support and referral were available; however, it is important to emphasize that this was not an art therapy intervention. Even though art therapists incorporate collage making for emotional and cognitive interventions, a clear delineation between art interventions and graphic elicitation for data

collection and communication in art therapy research must be understood and communicated.

## 5. Conclusion

Given the challenges in care for veterans with GWI, the collage graphic elicitation method holds promise for qualitative research in offering veterans an additional nonverbal way to represent and communicate the range of their lived experiences. Creating visual depictions enriched the verbal interviews by allowing veterans to synthesize their experiences, focus on sensitive or important issues, or elicit additional information that might be difficult to verbally articulate. The unique contributions of GE included enriched verbal explications, deeper reflections on moods and emotions, and metaphorical thinking capturing the lived experiences of veterans in greater detail. Further research with collage elicitation incorporating a greater sample size is recommended to recognize the role of demographics like gender, age, ethnicity, and context of exposure on veterans with GWI. Researchers should consider extending GE techniques to other Veteran patient populations to gain a deeper understanding of the unique conditions that Veterans experience.

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## CRediT authorship contribution statement

BM- Conceptualization; data curation; formal analysis; writing-original draft.

RDH- Project administration; data curation; formal analysis; writing-original draft.

BD- Project administration; investigation; writing-review & editing, supervision.

CB- Investigation; writing-review & editing.

GK- Conceptualization; project administration; methodology; funding acquisition; resources; writing-review & editing; supervision.

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