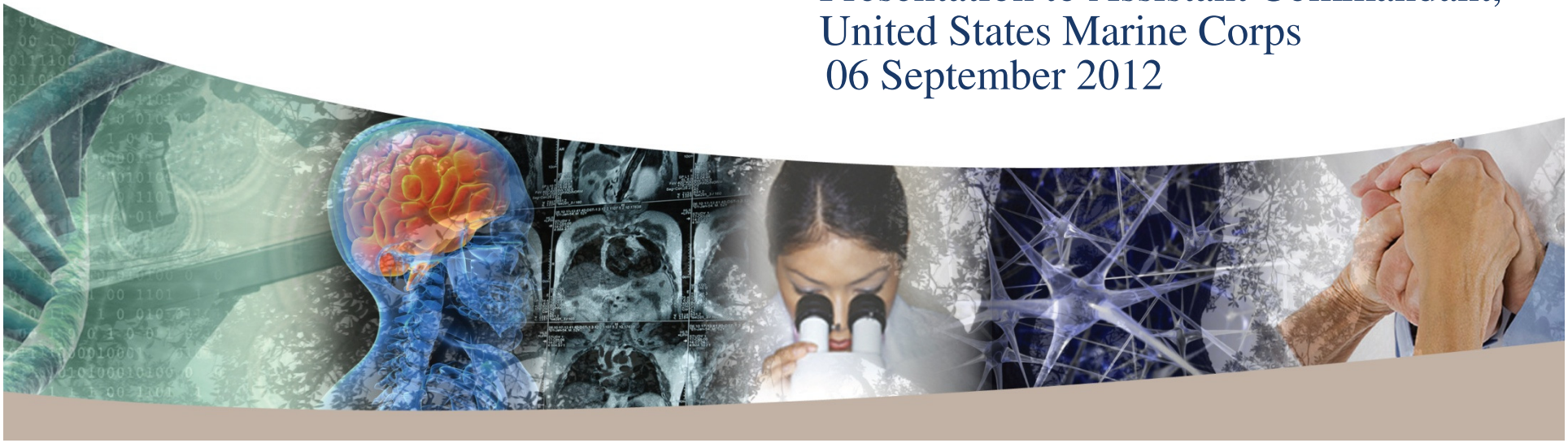
SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

Program Evaluation of Warrior Optimization Systems (WAROPS®) Training

Presentation to Assistant Commandant,
United States Marine Corps
06 September 2012



SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

PRESENTERS

- Salvatore Libretto, PhD
  Senior Program Manager, Samueli Institute
- Dawn Wallerstedt, MSN
  Senior Program Manager, Samueli Institute

RESEARCH TEAM

Lara Hilton, MPH; Roxana Delgado, MS; Pamela Elfenbaum, PhD; Ian Coulter, PhD; Courtney Lee, MA; Weimin Zhang, PhD; Swapna Thati, MS; Joan A.G. Walter, JD, PA; Wayne Jonas, MD; COL (Ret) Heidi Terrio, MD, MPH

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

DISCLAIMER

Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the U.S. Army Research Office (ARO), the Joint IED Defeat Organization (JIEDDO), the Western Regional Medical Command, and the U.S. Army Medical Command.

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

PROJECT OVERVIEW

Overview: Systematic Program Evaluation of WAROPS®, a skills-based resilience training program administered to soldiers in two Army BCTs (1 at pre- and post-deployment; 1at post-deployment only)

Purpose:

- Evaluate feasibility and acceptability of training program
- Assess impact and effectiveness of training goals (i.e. to manage operational stress, build resilience, enhance performance)

Methodology:

- Mixed methods approach; collect data on structure, process, outcomes

Key question:

To what extent, if any, did the program achieve its intended goals?

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

WAROPS® PROGRAM OVERVIEW

The 4-hour Core Training is divided into four 50-minute blocks of instruction:

Block 1: Performance, Brain and Body

Establishes the performance model and the neurophysiology of warrior adaptation and physical/mental regulation.

Block 2: Skills A (Breath, Attention)

Teaches physical and mental skills for effective mission performance and baseline resilience.

Block 3: Skills B (Visualization, Energy Management)

Teaches performance enhancing skills and introduces an optimal recovery process.

Block 4: Restoration (CORE™ exercises, Recovery)

Teaches restorative skills and methods to maintain resilience and performance throughout the deployment.

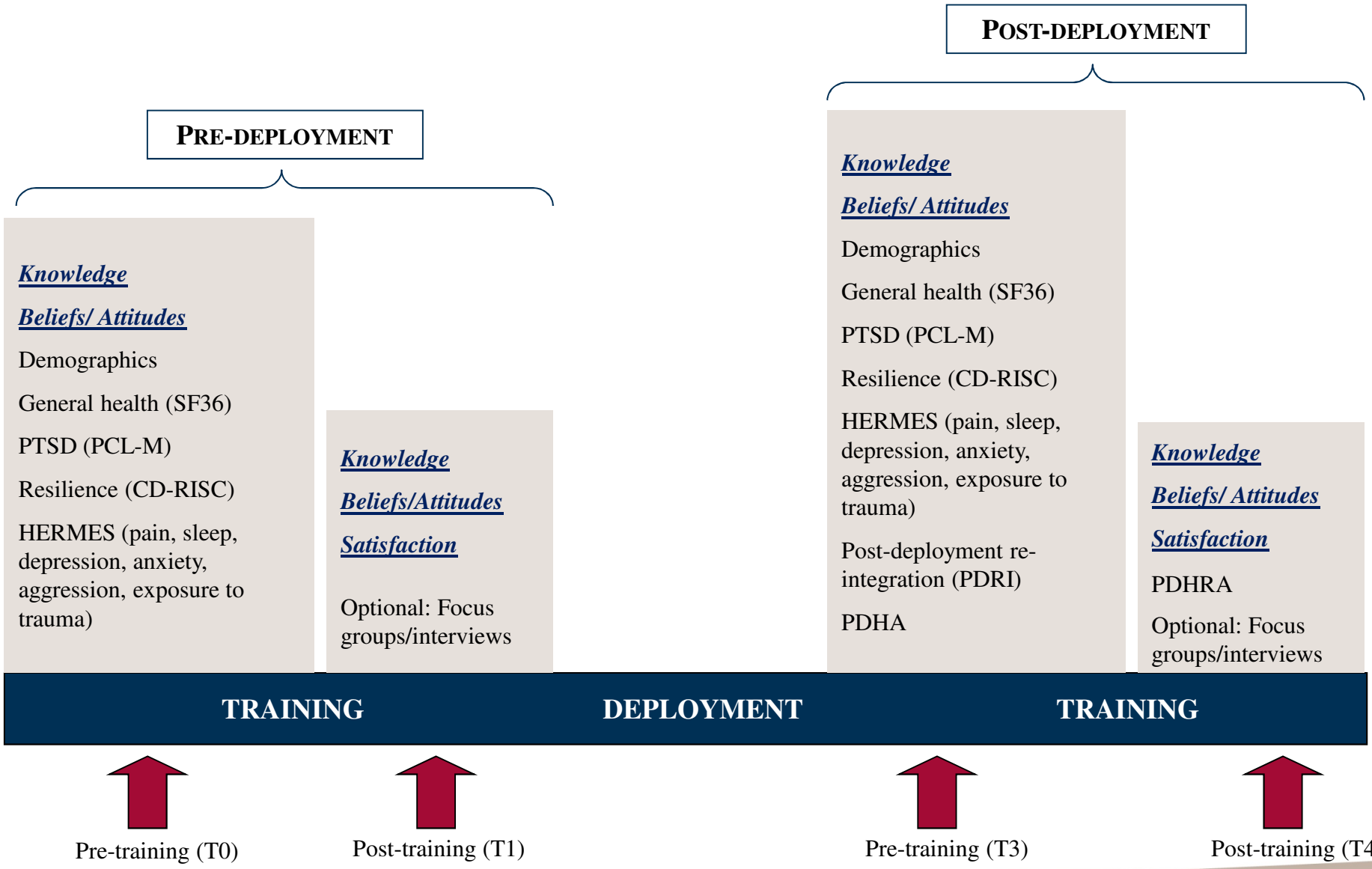
SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

RESEARCH QUESTIONS

- Can the training program be effectively incorporated into the deployment cycle (e.g., is it feasible and acceptable)?
- Will soldiers' knowledge, beliefs, and attitudes of how to recognize and manage stress increase after training?
- Did soldiers use WAROPS® skills during deployment and since redeployment? If so, to what extent and in what situations?
- Will soldiers who receive training at pre-deployment demonstrate fewer symptoms, less dysfunction, and better reintegration compared to soldiers who did not receive training at pre-deployment?

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

DATA COLLECTION OVERVIEW



SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

THROUGHPUT OF SOLDIERS TRAINED

	Pre-Deployment (4-4) Apr-May09	Post-Deployment (4-4) Jun-Jul09	Post-Deployment (3-4) Aug-Sept10	Total
Number of Soldiers Trained	1764	2273	1926	5963

DEMOGRAPHICS

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

Age	Pre-Deployment (4-4)		Post-Deployment (4-4)		Post-Deployment (3-4)	
	Mean	SD	Mean	SD	Mean	SD
	25.2	5.8	26.4	5.9	25.7	5.9

		Pre-Deployment (4-4)		Post-Deployment (4-4)		Post-Deployment (3-4)	
		N=1566	%	N=2175	%	N=1911	%
Gender	Male	1470	94.7	1958	90.4	1720	90.2
	Female	83	5.3	208	9.6	186	9.8
Marital Status	Single	481	31	570	26.4	602	31.6
	Married/In relationship	953	61.4	1365	63.2	1114	58.4
Education	High School	862	55.6	1044	48.3	1042	54.9
	Trade School/ Some college	547	35.3	877	40.6	663	35
	BA/BS and up	140	8.5	240	10.7	194	10

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

DEMOGRAPHICS

		Pre-Deployment (4-4)		Post-Deployment (4-4)		Post-Deployment (3-4)	
		N=1566	%	N=2175	%	N=1911	%
Pay Grade	E1 - E4	948	61.1	1293	59.8	1140	60.2
	E5 - E9	440	28.3	702	32.4	530	28
	W1 - W5	4	0.2	16	0.7	13	0.7
	O1 - O6	160	10.3	153	7	211	11.1
Times Deployed	0	435	34	186	8.6	275	16
	1	487	38.1	1055	48.8	782	45.6
	2 or more	356	27.8	922	42.6	657	38.3
Deployment Length	<12 months	180	14.1	276	12.7	277	16.2
	12 - 23 months	431	33.7	998	46.1	678	39.7
	24+ months	234	18.3	724	33.4	485	28.4

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

KNOWLEDGE QUESTIONS

Mean Total Knowledge Scores (Pre and Post-Deployment)

	Pre-Deployment		
	Pre-Training (T0)	*Post-Training (T1)*	*Mean Difference*
Mean Number Correct	5.16, *SD* = 2.42	6.57, *SD* = 2.22	1.41***

	Post-Deployment		
	Pre-Training (T3)	*Post-Training (T4)*	*Mean Difference*
Mean Number Correct	6.48, *SD* = 1.89	6.82, *SD* = 2.15	0.34***

*** $p < .001$

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

BELIEFS AND ATTITUDES

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

BELIEFS AND ATTITUDES OF TOTAL SAMPLE (% STRONGLY AGREE/AGREE)

	4-4 PRE-DEPLOYMENT (%)		4-4 POST-DEPLOYMENT (%)	
In stressful situations, I am confident that…	*Pre*	*Post*	*Pre*	*Post*
1. I can stay centered and focused	69	85***	72	83***
2. I can maintain mission focus and capability	84	86	86	85
3. I can maintain my confidence to succeed	78	86***	84	85
4. I can adapt easily to challenges	77	85***	80	84
5. I can manage my nervous systems' reactions	55	79***	52	78***
6. I can support my peak performance	68	84***	68	82***
7. I have the resilience to get through stressful situations	80	85***	82	85
8. I can maintain my health	81	86***	81	85*
9. I can effectively discharge tension and excess energy	62	84***	61	83***
10. I can reset and restore my balance	62	84***	61	82***

*$p < .05$, **$p < .01$, *** $p < .001$

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

SATISFACTION

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

SATISFACTION WITH TRAINING

	4-4 Pre-Deployment (N = 1443)	4-4 Post-Deployment (N = 1900)	3-4 Post-Deployment (N = 1728)
% Very Satisfied/Satisfied			
1. Overall satisfaction	88	88	92
2. Training materials	89	87	90
3. Instruction quality	91	90	94
% Strongly Agree/Agree			
4. Well-organized	93	92	96
5. Maintained interest	78	87	90
6. Provided useful information	85	86	91
7. Instructors were prepared	92	93	97
8. Instructors were well-organized	93	93	97

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

EXPECTED APPLICATION OF SKILLS

	4-4 Pre-Deployment (N = 1443)	4-4 Post-Deployment (N = 1900)	3-4 Post Deployment (N = 1728)
% Strongly Agree/Agree			
9. Will enhance stress control skills	85	86	90
10. Will improve performance	81	83	86
11. Stimulated thinking of what to do differently	84	85	89
12. Expect to use information	84	83	89
13. Change practice	80	79	84
14. Recommend to others	85	85	89
% Much More Effective/More Effective			
15. Comparison to other/previous WAROPS®training	77	55	85

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

USE OF WAROPS® SKILLS

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

REPORTED USE OF SKILLS DURING DEPLOYMENT

	N	At Least 1x/Day (%)	At Least 1x/Week (%)	At Least 1x/Month (%)	Rarely (%)	Never/ Not at all (%)	Any Use (%)
Breathing	1021	14	17	8	29	30	68
Attention	1020	15	17	12	25	31	69
Visualization	1018	14	17	14	25	29	70
Energy Management	1018	11	17	12	27	32	67
Recovery	1018	30	19	8	18	26	75
At least one skill	1043	38	56	62	77	23	NA

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

Most Commonly Reported Situations for WAROPS Skills Use during Deployment (N=1223)

- Preparing for a Mission
- Downtime
- Help Sleep
- During Mission
- After Mission

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

Reported Use of Skills Since Redeployment

	N	At Least 1x/Day (%)	At Least 1x/Week (%)	At Least 1x/Month (%)	Rarely (%)	Never/ Not at all (%)	Any Use (%)
Breathing	1015	10	13	10	27	40	60
Attention	1017	8	13	12	27	40	60
Visualization	1013	8	12	12	28	39	60
Energy Management	1015	8	12	11	27	41	58
Recovery	1015	23	16	8	19	34	66
At least one skill	1043	28	43	51	68	32	NA

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

MOST COMMONLY REPORTED SITUATIONS FOR WAROPS SKILLS USE SINCE REDEPLOYMENT (N=1224)

- Job Stress
- Help Sleep
- Family Stress
- Downtime
- Deal with Conflict

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

HEALTH-RELATED OUTCOMES

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

PRE- TO POST-DEPLOYMENT HEALTH OUTCOMES DIFFERENCES FOR WAROPS TRAINEES

Health Outcome	Pre-deployment Mean	Pre-deployment SD	Post-deployment Mean	Post-deployment SD	p-value
PCL-M Total score	25.5	11.3	24.6	10.1	
Subscale: Re-Experiencing	7	3.4	6.9	3.1	
Subscale: Avoidance/Numbing	10	4.7	9.3	3.9	0.0117
Subscale: Hyperarousal	8.5	4.3	8.5	4.1	
CD-RISC	30.7	6.9	31.4	7.2	0.0176
SF-36 – Physical Health Summary Score (PCS)	52.6	7.5	52.4	7.6	
SF-36 – Mental Health Summary Score (MCS)	50.1	9.8	52.9	8.7	<.0001
SF-36 Subscales					
SF-36 – Physical Functioning	52.4	9.3	52.4	8.1	
SF-36 – Physical Role Limitation	52.2	7.8	52.2	7.7	
SF-36 – Pain	51.8	9.1	53.1	9.3	0.0028
SF-36 – General Health	51.8	8.4	51.8	8.8	
SF-36 – Emotional Well-Being	49.8	0.4	52.5	9.6	<.0001
SF-36 – Emotional Role Limitation	51.7	8.6	52.3	7.4	
SF-36 – Social Functioning	50.3	9	52.3	8.5	<.0001
SF-36 – Energy/Fatigue	51.9	9.7	55.2	10.4	<.0001

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

HEALTH OUTCOMES DIFFERENCES FOR WAROPS TRAINEES VS. NON-TRAINEES AT POST-DEPLOYMENT

Health Outcome	WAROPS Trainees		WAROPS Non-Trainees		p-value
	Mean	SD	Mean	SD	
PCL-M Total Score	24.6	10.1	26	11.8	
Subscale: Re-experiencing	6.9	3.1	7.5	3.7	0.0353
Subscale: Avoidance/Numbing	9.3	3.9	9.9	4.7	
Subscale: Hyperarousal	8.5	4.1	8.7	4.3	
CD-RISC	31.4	7.2	30.8	6.8	
SF-36 – Physical Health Summary Score (PCS)	52.4	7.6	52.6	7.8	
SF-36 – Mental Health Summary Score (MCS)	52.9	8.7	51.5	9.5	
SF-36 Subscales					
SF-36 – Physical Functioning	52.4	8.1	53	7.3	
SF-36 – Physical Role limitation	52.2	7.7	51.6	8.1	
SF-36 – Pain	53.1	9.3	52.9	9.3	
SF-36 – General Health	51.8	8.8	51.9	9.1	
SF-36 – Emotional Well-being	52.5	9.6	51.6	10.7	
SF-36 – Emotional Role limitation	52.3	7.4	51.8	7.6	
SF-36 – Social Functioning	52.3	8.5	50.7	9.8	0.0328
SF-36 – Energy/Fatigue	55.9	10.4	54	10.7	

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

HEALTH OUTCOMES DIFFERENCES FOR WAROPS TRAINEES VS. NON-TRAINEES AT POST-DEPLOYMENT

Health Outcome	WAROPS Trainees		WAROPS Non-Trainees		p-value
	Mean	SD	Mean	SD	
PDRI Total Score	52.3	21.1	55.6	23.8	
Subscale: Career	7.1	3	7.5	3.4	0.0114
Subscale: Health	7.7	3.8	7.9	4.1	
Subscale: Intimate Relationships	6.7	3.2	7.1	3.4	0.0056
Subscale: Social Relationships	9.1	4.4	9.9	4.8	0.0284
Subscale: Concerns of Deployment	8.7	3.6	9.4	4.3	
Subscale: PTSD Symptoms	13.1	6.3	13.8	6.7	

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

HEALTH OUTCOMES DIFFERENCES FOR WAROPS USERS VS. NON-USERS AT POST-DEPLOYMENT

Health Outcome	WAROPS Non-Users Mean	WAROPS Non-Users SD	WAROPS Users Mean	WAROPS Users SD	p-value
PCL-M Total Score	25.2	10.1	23.8	10	0.0127
Subscale: Re-experiencing	7	3.2	6.7	3	
Subscale: Avoidance/Numbing	9.4	4	9	3.9	
Subscale: Hyperarousal	8.8	4.1	8.1	4	0.0154
CD-RISC	30.7	7.4	32.5	6.8	0.0014
SF-36 – Physical Health Summary Score (PCS)	52.4	7.4	52.4	7.9	
SF-36 – Mental Health Summary Score (MCS)	52.3	8.7	53.7	8.8	0.0053
SF-36 – Physical Functioning	52.5	8.3	52.49	7.8	
SF-36 – Physical Role Limitation	52.3	7.5	52.1	8	
SF-36 – Pain	52.8	9.1	53.6	9.6	
SF-36 – General Health	51.3	8.7	52.4	9	
SF-36 – Emotional Well-Being	51.7	9.7	53.6	9.4	0.0039
SF-36 – Emotional Role Limitation	52.2	7.5	52.4	7.4	
SF-36 – Social Functioning	52.5	8	52	9.1	
SF-36 – Energy/Fatigue	54.2	10.5	56.6	10	0.0019

HERMES HEALTH OUTCOME DIFFERENCES: USERS/NON-USERS AT POST-DEPLOYMENT (CONT'D)

	Non-User	N	User	N	p-value	Pre Non-Trainee	N	p-value
Perception of Unit Support (DRRI-US)	15.6	367	18.1	265	<.0001	16.0	222	0.0009
Anxiety (PHQ-Anxiety)	3.3	412	2.6	301	0.016	3.3	243	0.039
Panic (PHQ-Panic)	0.02	410	0.02	300		0.04	240	
PTSD (PC-PTSD)	0.07	414	0.06	302		0.1	244	
Depression (PHQ-9)	3.4	413	3.0	302	0.0032	3.9	244	0.003

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

HERMES HEALTH OUTCOME DIFFERENCES: USERS/NON-USERS AT POST-DEPLOYMENT (CONT'D)

	Non-User	N	User	N	p-value	Pre Non-Trainee	N	p-value
Anger (DAR)	9.5	414	8.1	302	0.0355	9.7	244	0.0107
Suicide Risk	0	413	0	302		0	244	
Alcohol Use (Including AUDIT)	4.7	413	4.3	302		4.2	244	
Violence & Safety	0.5	413	0.3	302	0.0291	0.4	244	
Behavioral Health Treatment History	0.2	414	0.2	302		0.2	244	
Seeking Services	0.2	414	0.1	302		0.2	244	0.0007

PDHA Health Outcome Differences: Users/Non-Users at Post-Deployment

	Non-User (%)	N	User (%)	N	p-value	Pre Non-Trainee (%)	N	p-value
At Risk for Depression (PHQ2-Depress)	4.6	457	2.6	311		6.1	293	0.0313
PTSD (PCPTSD)	3.3	455	3.5	311		5.1	293	
Domestic Violence (Lose Control Score)	0.2	456	0.6	310		0.7	293	
Alcohol Screening	3.1	457	3.9	311		5.8	291	
Health Assessment Score	90.6	459	94.3	314		92.2	295	
Hospitalized Score	5.2	458	6.7	312		6.5	294	

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

Interview Quotes

- "You can use a little piece of this in every situation, especially in combat situations. You're not only going to be facing the enemy, sometimes you're going to be facing your squad leader because you got into an argument in the truck. Some of this can actually calm you down and relieve some of that extra energy."
- "Core training was one of the exercises that you can use it every day when you wind down, when you are stressed; you can recover from that or relax for the rest of the day."

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

Interview Quotes

- Receiving the training by military-experienced professionals made it "more interactive"…"we got up we moved around, we practiced what was being taught, and it was also cool to be able to relate to guys who have been in the service, who are Navy Seals, Special Forces operator, and Air Force."
- "…to control your heart rate, in highly emotional and highly dramatic situations, the more level headed and the more calm you can be the easier it is to make the right decision when the time comes".

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

Interview Quotes

- "I showed my wife last year"…"shared with my brother, he is a Marine, he was talking about his lower back hurting and I showed him the stretches. My daughter has a temper so I'd teach her how to do the breathing to calm down…I'd teach her the simulation-see yourself doing something before you do it- that way it can help you out with it. The energy…teach her how to get energy, how to burn her energy, all that stuff. Just basically everything they taught us, I'd try to teach my daughter".

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

Interview Quotes

- “With me, knowing the breathing, there were many situations I handled differently ‘cause I did just exactly what he said: stop, you take a breath, and your whole decision-making process changes. It’s like it clears the clouds out of the way.”
- “I think just being through the training, I am able to handle stress a lot easier than before I deployed.”

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

LIMITATIONS OF STUDY

We found health-related and other benefits for soldiers who attended the training and used the skills regularly; however, we recommend that these results be regarded cautiously, since soldiers were not randomized to the training/non-training groups in this observational study.

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

CONCLUSIONS

- WAROPS® program appears to be feasible to implement in large groups of Service members
- High satisfaction with training (90% satisfied/very satisfied)
- Knowledge and self-efficacy increased from pre- to immediately post-training
- Skill use was high during deployment
  - 56% of soldiers reporting using at least one skill, at least weekly.
- Preliminary evidence of health-related benefit in soldiers who received training and regularly used skills:
  - Greater resilience, fewer PTSD symptoms, better post-deployment reintegration, better general health and well-being scores

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

RECOMMENDATIONS

Training Delivery

- Maintain program delivery (small groups, high trainer-trainee ratio, fewer PowerPoint slides, experiential/interactive activities, trainers with Special Forces background)
- Split training into more than one time period
- Integrate refresher sessions to sustain use of skills

Leader Buy-In

- Leaders were underrepresented at “leadership” module
- Highly recommend buy-in at all levels of leadership, especially platoon sergeants/unit commanders

Sustainer Module

- Recommend full implementation of the Sustainer module to encourage continued skill use

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

RECOMMENDATIONS (CONT'D)

Post-Deployment Training

- Post-deployment training should include refresher of previous skills and emphasize reintegration/adjustment back to life in garrison

Timing in Training Cycle

- Training should occur earlier in deployment cycle

Communication and Coordination

- Prioritize clear communication with brigade leadership to enhance coordination, prevent inaccurate information about training

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

RECOMMENDATIONS (CONT'D)

Skills Implementation/Mandatory Practice

- Institute group practice of skills
- Intersperse with regular field training
- Incorporate skills into PT, led and supported by unit leaders

Recommendations for Future Research

- Further study of the WAROPS® training to include:
  - Randomized design with control group receiving an equivalent training
  - Replication in other Service Member populations

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

ACKNOWLEDGMENTS

This material is based upon work supported by the U. S. Army Research Office (ARO) and the Joint IED Defeat Organization (JIEDDO).

The evaluation team would like to thank COL Todd Dombroski and all of the soldiers who participated in this evaluation.

SAMUELI INSTITUTE
EXPLORING THE SCIENCE OF HEALING

Questions?

Contact: Dr. Salvatore Libretto

slibretto@samueliinstitute.org