- Predictors of Booster Engagement Following a Web-Based Brief Intervention for Alcohol Misuse Among National Guard Members: Secondary Analysis of a Randomized Controlled Trial

- Coughlin LN, Blow FC, Walton M, Ignacio RV, Walters H, Massey L, Barry KL, McCormick R

- JMIR Ment Health 2021;8(10):e29397

Engagement in eHealth Interventions

Engagement vs Adherence vs Compliance

Gamification/apps?

Degree of effort involved?

An understudied area in eHealth

-despite recognition that it is a barrier to public health goals of interventions

-delivery modes

-targeting/tailoring interventions to subpopulations

A project to develop translatable eHealth interventions for military reserve component members

- 1.) Mission Strong: Web Intervention with Web or Peer Boosters (NIAAA-RO1)(N=757)
  - A.) Brief Intervention
  - B.)Voluntary Boosters (once a month for 3 months)
- 2.) Project Guard: Smartphone Intervention (MOMRP/NIAAA)(N=850)
  - A.)Brief Intervention
  - B.) BCI's For Three Months:
    - Tracking alcohol use, stress, exercise
    - TIPS- prompts of drinking strategies
    - Newsfeed push texts- enrolling and commenting
    - Virtual Coach

Mission Strong:
A Randomized Controlled Trial of Peer and Web Delivered Interventions for Risky Drinking Among National Guard Members

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Background

~21 Million in US with direct connection to military service
-share characteristics

~19 Million veterans who no longer in military

~1.3 Million active duty personnel

~800,000 reserve component personnel
Army National Guard ~336,000

28% of deployments to Iraq and Afghanistan by reserve components – mostly Army NG
-no intent to use them initially

Now an integral part of military force planning

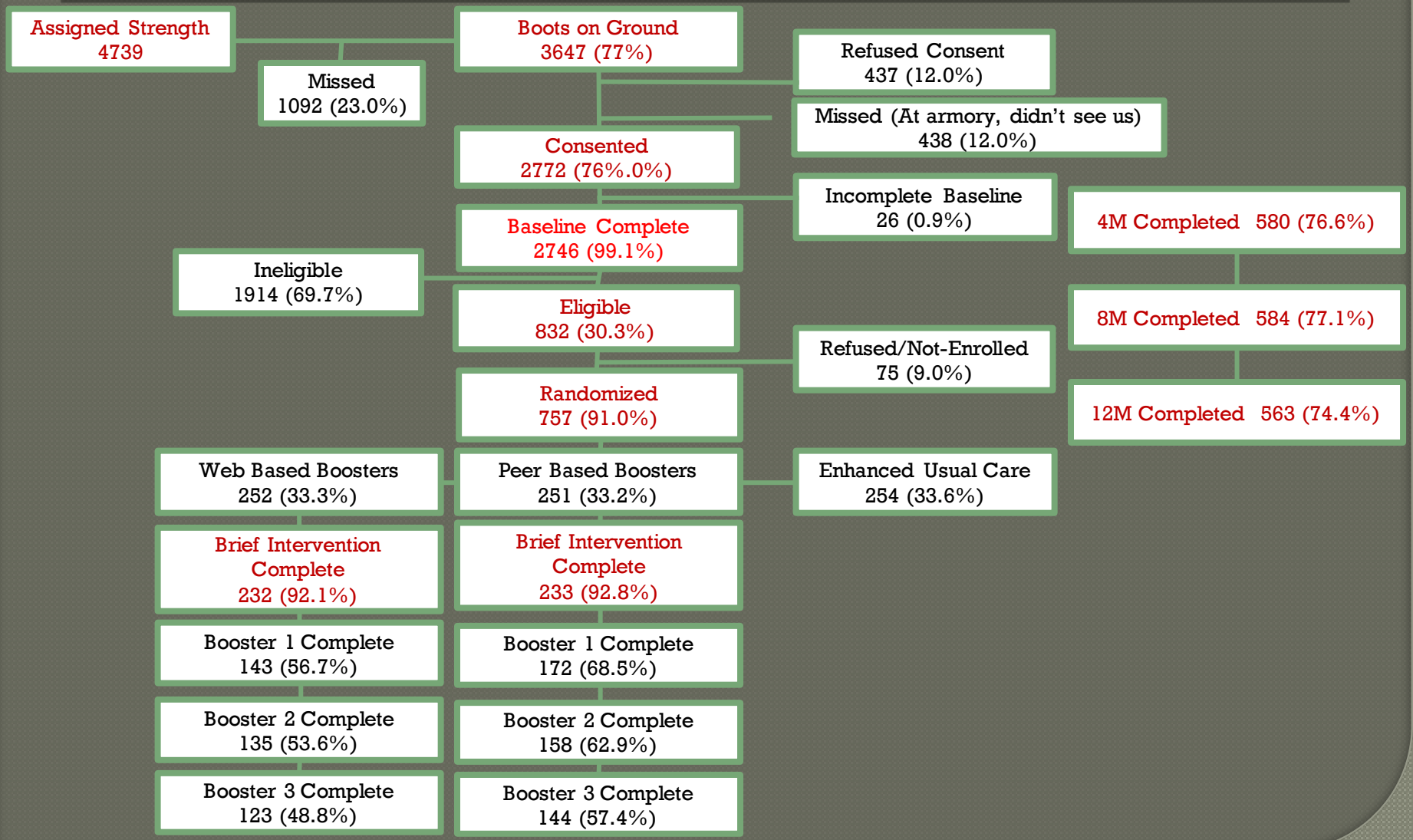
Challenge: How to maintain their resilience at level comparable to active duty

Background/Problem

- National Guard members are at high risk for hazardous use of alcohol and prescription drugs, which adversely effects military and civilian function.
- Addressing these issues in reserve component members is especially challenging because they live in dispersed locations and have less contact with military command and support resources.
- Consequently, we developed and tested economically feasible e-health, population-based health interventions.
- We also test the additive value of support from peer (shared military connection) counselors.

- Interventions were tailored, with National Guard input, to the Guard and designed to be engaging.
- Interventions could supplement usual, mandated military educational training on alcohol/substance misuse.

Enrollment and Follow-up



Baselne Asses Demographics (n=2746)

Measure	Prescription +/- Alc (N=75).	Alcohol Only N=769	No Misuse N=1902
Female	26.7%*	14.4%	12.9%
Age	30.2	28.4	29.2
Black	18.7%*	9.1%	12.1%
Hispanic	20%*	12%	10.7%
Not employ.	24%*	14.8%	13.8%
Deployed	61.3%*	49.5%	44.7%
Financial-trouble	50.7%*	32%#	20.7%

Negative Affect

Measure	Prescription +/- Alc (N=75)	Alcohol Only N=769	No Misuse N=1902
PHQ	11.1*	4.9#	2.5
GAD	11.2*	5.5#	3.1
Trauma	64.0%*	33.2%#	23.7%
PCL>38 (if trauma)	56.3%*	18.8%#	9.8%
Mil. Sex			
Unwanted	17.3%*	6.6%	4.8%
MSex Force	6.7%*	0.9%	1.0%
Thought/death	37.3%*	14.7%#	6.8%
Suic. Ideation.	20%*	9.6%#	3.3%
Drink/cope Dep.	6.8*	4.9#	3.4

Disinhibition

Measure	Prescription +/- Alc (N=75)	Alcohol Only N=769	No Misuse N=1902
Impulsivity	3.2*	2.0#	1.6
Illicit drug use	17.3%*	6.4%#	1.8%
Marijuana use	30.7%*	9.2%	2.2%
ASSIST Marijuana	3.7*	0.8	0.2
Threat/ Assault	80%*	5.5%	2.8%
Risky Sex	7.1*	6.2#	5.1

	Brief Intervention
Section 1: **What's this all about?**	-Introduction, -Pick "guide" avatar, and review confidentiality
Section 2: **What's important to me?**	-Elicit: Strengths & Goals/Values (lists)
Section 3: **What are my health habits?**	-Provide data from surveys regarding alcohol (with drinking Guidelines), with feedback regarding safer limits -Provide data from surveys about prescription opioids & review overdose risks
Section 4: **How can my health habits affect me?**	-Elicit concerns -Provide audio peer message about benefits of change -Elicit benefits of change (lists) -Provide midway summary
Section 5: **What choices do I have?**	-Elicit readiness to Change -Provide peer message about strategies to change -Elicit challenges (e.g., people, places, situations, thoughts, feelings) - Provide strategies (e.g., coping, leisure activities, use reduction strategies, safe rides home, pain/stress/sleep management) -Elicit Confidence (ruler)
Section 6: **What's next for me?**	-Provide summary (goals, strengths, benefits, readiness, strategi Make initial plan

Description	(booster 1)	(booster 2)	(booster 3)
Section 4: How can my health habits affect me?	-Finance calculator what could spend money on instead -Reasons for use & activities	-Physical fitness calculator of alcohol calories and exercise -Mood and drinking	-Getting places calculator of BAC + strategies get home safely -Social Influences & drinking
Section 5: What choices do I have?	-Strategies (e.g., coping, leisure activities, use reduction strategies, safe rides home, pain/stress/sleep management)	-Strategies (e.g., coping, leisure activities, use reduction strategies, safe rides home, pain/stress/sleep management)	-Strategies (e.g., coping, leisure activities, use reduction strategies, safe rides home, pain/stress/sleep management)
Section 6: What's next for me?	Plan: one next step	Plan: one next step	Plan: one next step

Table 4. Alcohol use outcomes by Intervention and Follow-Up

*p<.05; ** p<.01 from paired t-tests of baseline vs. 12-month outcomes among those who reported both baseline and 12-month follow-up

Intervention/Follow-Up	N	Quantity* Frequency	Binge Drinking	Audit-C	AuditSum
		Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Intervention+Web Booster					
Baseline	246	58.7 (94.7)	4.2 (6.0)	6.6 (1.8)	9.4 (5.7)
4-month	176	44.2 (68.5)	3.1 (4.8)	5.2 (2.3)	7.6 (5.6)
8-month	175	44.4 (83.6)	3.4 (5.9)	5.1 (2.4)	7.3 (5.4)
12-month	175	46.9 (104.1)	2.8 (4.9)	4.6 (2.4)	6.5 (5.0)
%change in mean, baseline to 12-month		-20.0*	-32.9**	-30.8**	-31.6**
Intervention+Peer Booster					
Baseline	245	62.4 (94.9)	5.2 (6.8)	6.7 (1.8)	9.7 (5.7)
4-month	178	38.6 (41.6)	3.3 (5.0)	5.2 (2.4)	7.5 (4.7)
8-month	184	37.4 (47.8)	3.5 (5.7)	4.8 (2.6)	7.0 (5.1)
12-month	174	43.5 (107.0)	2.6 (4.9)	4.3 (2.6)	6.1 (5.3)
%change in mean, baseline to 12-month		-30.4*	-50.1**	-34.9**	-37.2**
Enhanced Usual Care					
Baseline	248	51.2 (84.6)	4.2 (5.7)	6.6 (1.8)	9.1 (5.1)
4-month	213	42.8 (44.7)	4.6 (6.6)	5.4 (2.6)	7.8 (5.5)
8-month	212	41.2 (48.2)	4.2 (6.7)	5.0 (2.7)	7.0 (5.2)
12-month	201	43.7 (82.2)	4.0 (6.6)	4.9 (2.9)	7.1 (6.2)
%change in mean, baseline to 12-month		-14.6	-5.0	-26.5**	-21.8**

Binge Drinking (episodes/month)

Figure 3. Binge Drinking by Intervention and Follow-Up

Engagement

Table 2. Number of booster sessions completed by delivery modality.

Booster sessions	Web n (%)	Peer n (%)
0	95 (39)	76 (31)
1	19 (8)	14 (6)
2	24 (10)	13 (5)
3	108 (44)	142 (58)

- X^2= 10.39, p=0.006
- Verified in stepwise regression modle

Unadjusted Associations Web

	Web-delivered boosters				
	0 (n=95)	1 or 2 (n=43)	3 (n=108)	Test statistic	p-value
	N(%) or M(SD)	N(%) or M(SD)	N(%) or M(SD)		
Baseline characteristics					
Gender (male)	86(41.55)	34(16.07)	87(42.03)	$X^2(df=2)=4.77$	0.09
Age	27.4(7.5)	27.9(7.4)	30.5(7.7)	$F(1,244)=8.54$	<0.01
Highest grade completed				$X^2(df=4)=26.15$	<0.01
High school or less	30(58.82)	9(17.65)	12(23.53)		
Some college	54(40.60)	25(18.80)	54(40.60)		
College or more	11(17.74)	9(14.52)	42(67.74)		
Rank				$X^2(df=4)=19.16$	<0.01
E1-E4	60(45.11)	29(21.80)	44(33.08)		
E5-E9	31(32.98)	14(14.89)	49(52.13)		
WO1-WO5/O1-O9	4(21.05)	0(0)	15(78.95)		
Household income				$X^2(df=6)=19.18$	<0.01
$25K or less	29(46.48)	10(15.38)	26(40.00)		
$25K-50K	33(24.49)	12(16.90)	26(36.62)		
$50K or more	24(24.49)	19(19.39)	55(56.12)		
Refused	9(75.00)	2(16.67)	1(8.33)		
Trauma exposure (yes)	21(26.25)	17(21.25)	42(52.50)	$X^2(df=2)=7.66$	0.02

Unadjusted Peer

	Peer-delivered boosters				
	0 (n=76)	1 or 2 (n=27)	3 (n=142)	Test statistic	p-value
	N(%) or M(SD)	N(%) or M(SD)	N(%) or M(SD)		
Baseline characteristics					
Gender (male)	57(27.80)	22(10.73)	126(61.73)	$X^2(df=2)=6.94$	0.03
Age	26.8(6.2)	26.9(8.1)	28.6(6.9)	$F(1,244)=4.08$	0.04
Race				$X^2(df=2)=6.16$	0.05
White	68(32.38)	19(9.05)	123(58.57)		
Other	8(22.86)	8(22.86)	19(54.29)		
Marital status				$X^2(df=6)=17.37$	<0.01
Married	16(25.00)	3(4.69)	45(70.31)		
Living together	16(6.53)	7(21.88)	9(28.13)		
Widow/Divorced/Seperated	8(25.00)	4(12.50)	20(62.50)		
Never married	36(30.77)	13(11.11)	68(58.12)		
Highest grade completed				$X^2(df=4)=7.77$	0.10
High school or less	18(40.91)	4(9.09)	22(50.00)		
Some college	45(31.91)	19(13.48)	77(54.61)		
College or more	13(21.67)	4(6.67)	43(71.67)		
Employed (yes)	69(33.82)	19(9.31)	116(56.86)	$X^2(df=2)=6.56$	0.04
Household income				$X^2(df=6)=12.02$	0.06
$25K or less	28(37.33)	9(12.00)	38(50.67)		
$25K-50K	27(36.00)	8(10.67)	40(53.33)		
$50K or more	18(21.18)	7(8.24)	60(70.59)		
Refused	3(30.00)	3(30.00)	4(40.00)		
Ever deployed (yes)	30(25.00)	10(8.33)	80(66.67)	$X^2(df=2)=7.37$	0.03
PHQ	4.4(4.9)	6.0(4.9)	6.2(6.0)	$F(1,244)=4.72$	0.03
GAD	4.8(4.9)	6.9(4.5)	6.7(5.9)	$F(1,244)=5.43$	0.02

Adjusted Stepwise Model

	Combined			Web			Peer	
	X^2	p-value		X^2	p-value		X^2	p-value
Arm **Reference: Web-delivered**	9.79	<0.01		--	--		--	--
Education **Reference: College or more**	24.90	<0.01		24.62	<0.01		7.49	0.11
Income **Reference=$25,001-$50K**	11.43	0.02		6.07	0.19			
Marital Status **Reference: Living together**							16.77	0.01
Employed	3.64	0.16					8.79	0.01
Gender **Reference: Male**				3.30	0.19		5.61	0.06
Rank **Reference: E1-E4**	5.43	0.07		6.31	0.04			
Deployed				5.21	0.07			
Anxiety (GAD)	4.12	0.13		3.77	0.15			
Depression (PHQ)							4.11	0.13
Alcohol use severity (AUDIT)	2.65	0.27						
Binge drinking frequency				3.51	0.17			
Traumatic event				4.43	0.11			
Confidence can reduce alcohol use	3.59	0.17						
Motive: Enhancement							7.71	0.02
Motive: Coping							2.99	0.22
Motive: Social				3.05	0.22		4.55	0.10
Drink and drive							3.85	0.15

	Web-Booster			Peer-Booster			
Boosters	0 N(%)	1 or 2 N(%)	3 N(%)	0 N(%)	1 or 2 N(%)	3 N(%)	p-value
Male	86 (42)	34(16)	87(42)	57(28)	22(11)	126(61)	.0005
White	77(40)	34(18)	81(42)	68(32)	19(9)	123(59)	.002
Deployed.	45(37)	23(19)	53(44)	30(21)	10(8)	80(67)	.002
Rank E1-E4.	60(45)	29(22)	44(33)	45(33)	18(13)	73(54)	.003
Never Married.	44(44)	18(18)	39(39)	36(31)	13(11)	68(58)	.015
PHQ mild or worse depression	37(36)	21(20)	45(44)	31(26)	13(11)	75(63)	.012
GAD >9	29(46)	15(24)	19(30)	13(20)	6(9)	47(71)	.0004

Pragmatic Importance

- Effect of human contact may be enhanced by military comradery
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- Once contact was made higher percent completed all 3 boosters (84%) than when 1 booster done in web (71.5%) ($p<.01$)
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-
- VA invested heavily in peer counselors
- Military have mental health/resilience technicians
- But expensive, so important to identify those most needing or benefiting from it compared to a less expensive web delivery format
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- **Negative Affect**
- - Rates of screening in this alcohol misusing population high (45% for depression; 24% for anxiety)
-
- -They represent a large and clinically meaningful subset, needing more attention in general including due to suicide risk (Alcohol+Gun+Sad)