

UPDATE ON FIRE RESEARCH

Joy C MacDermid BScPT MSc PhD FCAHS FRSC



FIREWELL

UPDATE TOPICS

What have we heard from firefighters about their experiences and priorities?

Our UNALARM Model

Development of a work limitations questionnaire


Comparison of different resiliency programs

What progress have we made on resilient minds?



FIREWELL

Canadian Career Firefighters' Mental Health Impacts and Priorities

Joy C. MacDermid^{1,2,3,*} , Margaret Lomotan³ and Mostin A. Hu⁴

- 33 men, 6 women)
- Lieutenant/Acting Captain/Captain (n = 11);
Assistant Deputy Chief/Deputy Chief/Chief (n = 7).
- British Columbia (n = 2), Alberta (n = 1), Nunavut (n = 2), Quebec (n = 6), and Ontario (n = 28).



FIREWELL

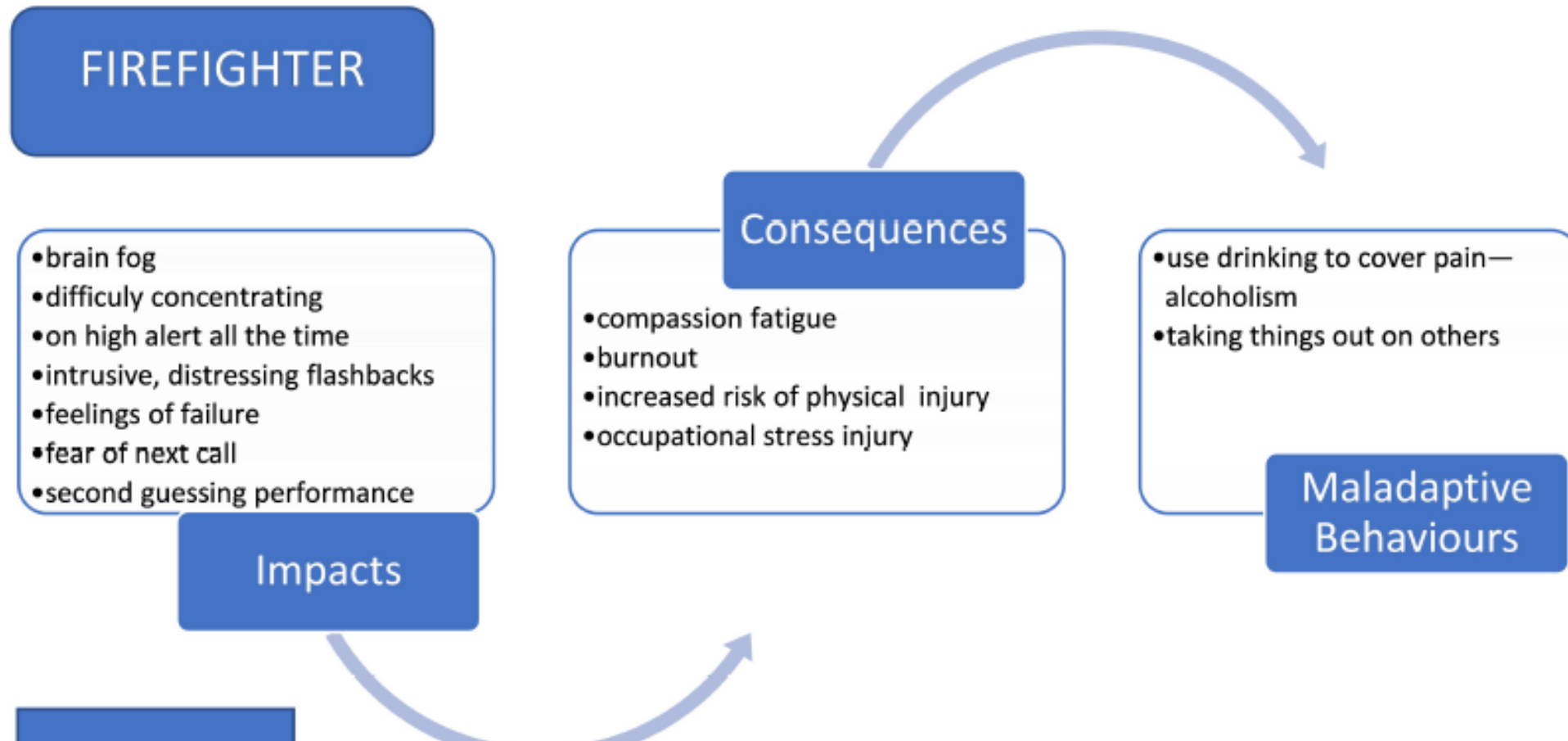
RESEARCH PRIORITIES

- Awareness and monitoring
 - a. Trends in mental health ;
 - b. Bi-annual exams and surveys for physical and mental health
- 2. Understanding mental health
 - a. Other mental health issues beyond PTSD
 - b. The cumulative effects of mental health exposures
 - c. Brain mechanisms that lead to mental health/PTSD issues
 - d. WAYS TO MEASURE EXPOSURES AND OUTCOMES
- 3. Better prevention and treatment
 - a. Research on early signs and symptoms
 - b. DESIGN AND EVALUATION OF PREVENTION AND TREATMENT PROGRAMS
- 4. Access to care
 - a. Geographic variations in programs/service

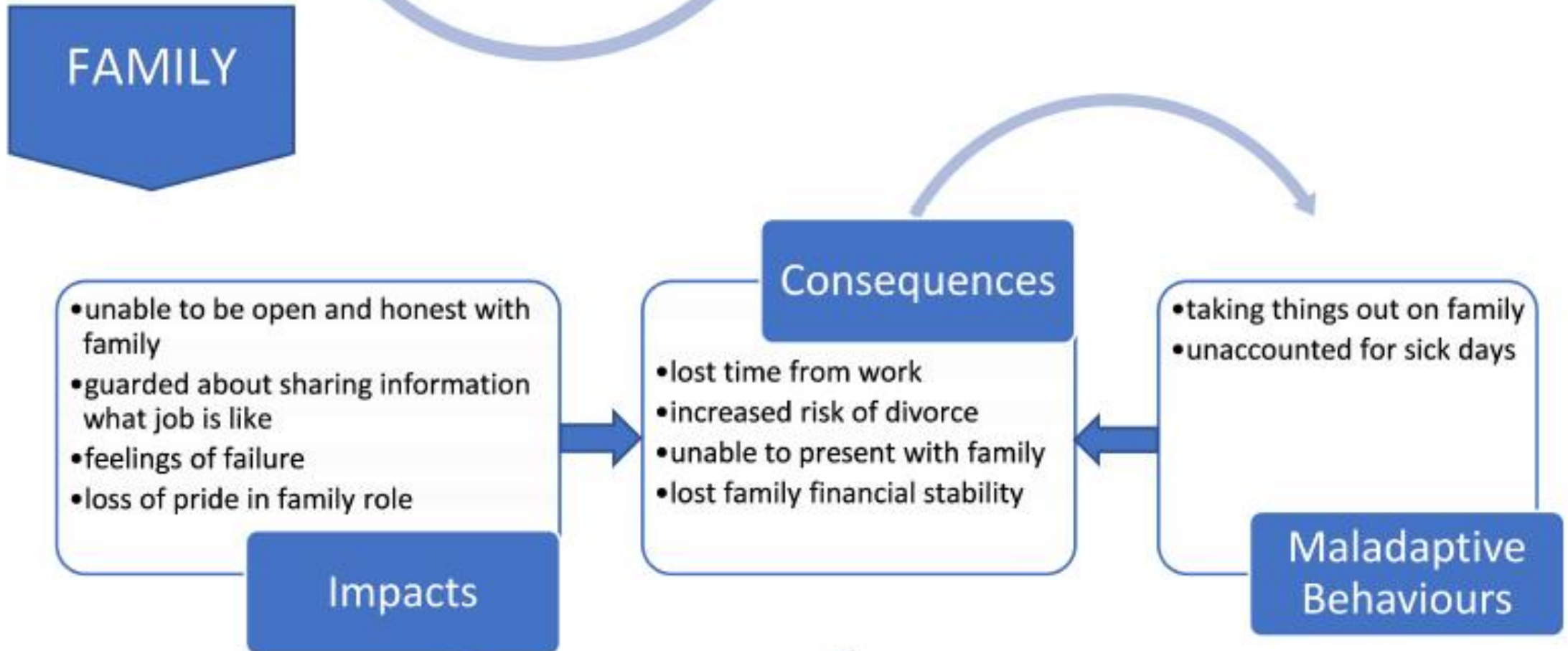


FIREWELL

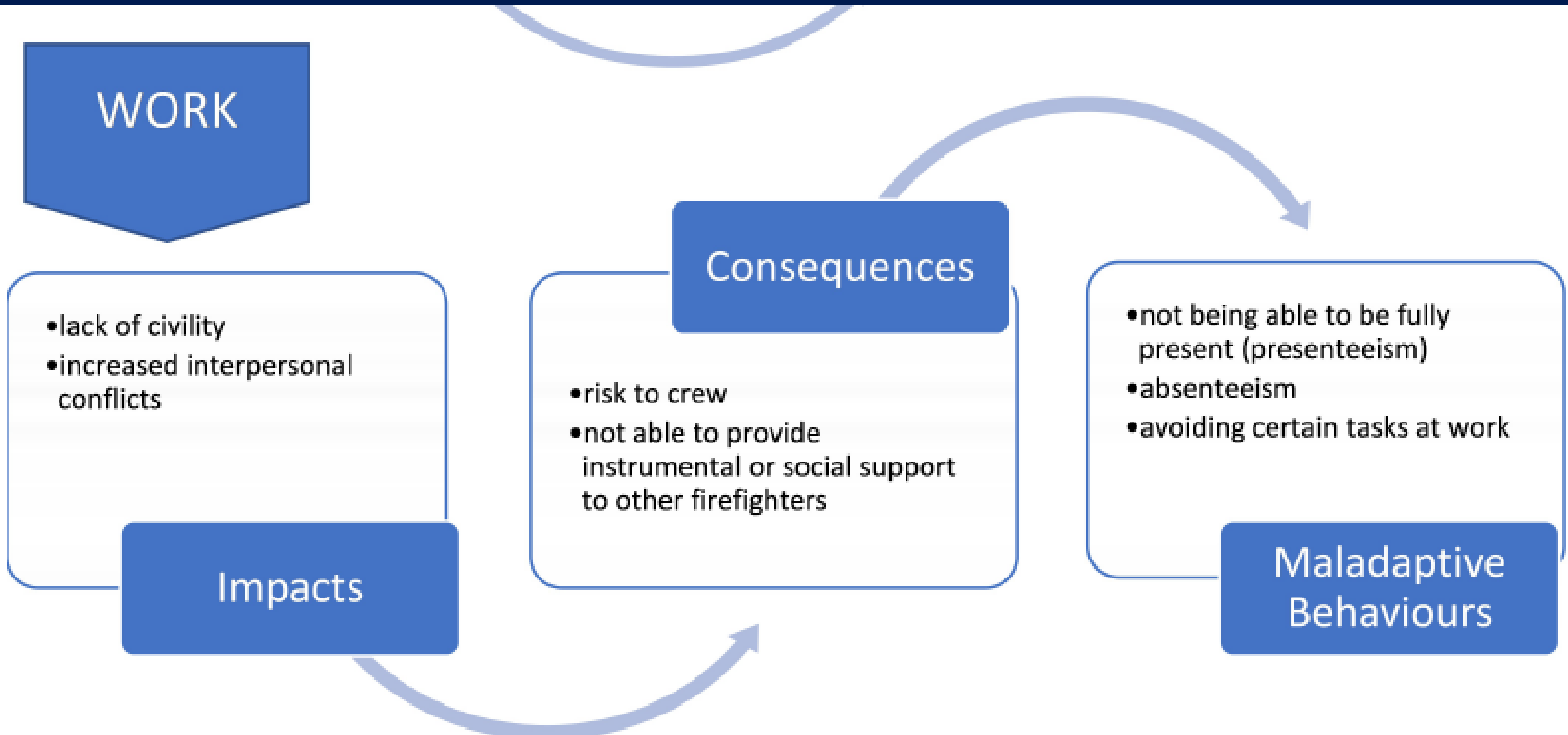
FIREFIGHTER EXPERIENCE OF MENTAL HEALTH



FAMILY IMPACT



WORK IMPACTS



Unified Neuromatrix Allostatic Load and Resiliency Adaptation Model (UNALARM)

Life: Exposures, Injury, Trauma, Events, Aging

Loading...

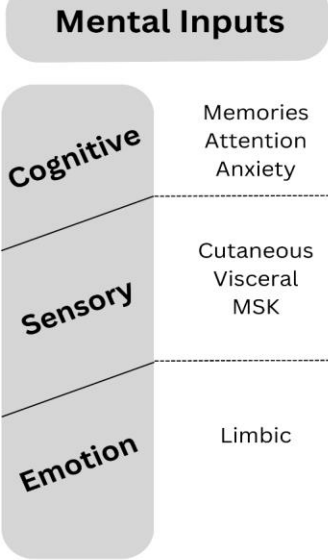
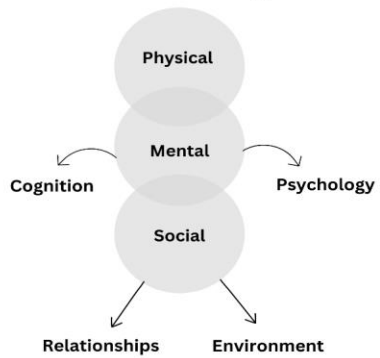
TIME

Body-Self Neuromatrix

Allostatic stress regulator program

Positive homeostatis adaptation + resiliency

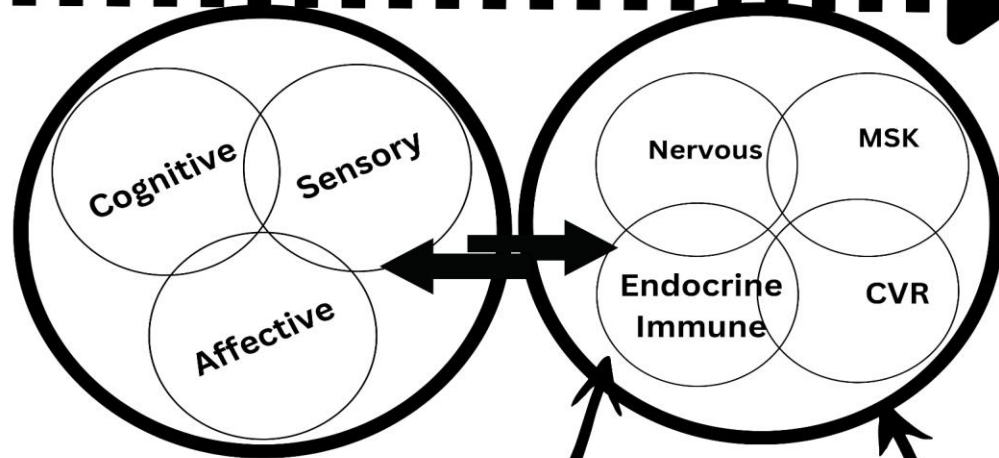
Pre-exposure Health, Well-being, Role Functioning



Physical Inputs



Social Inputs



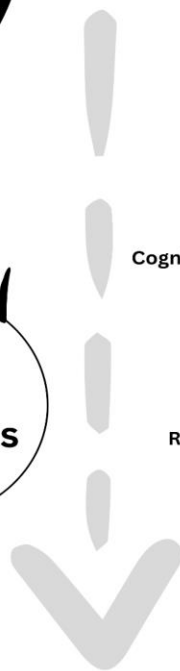
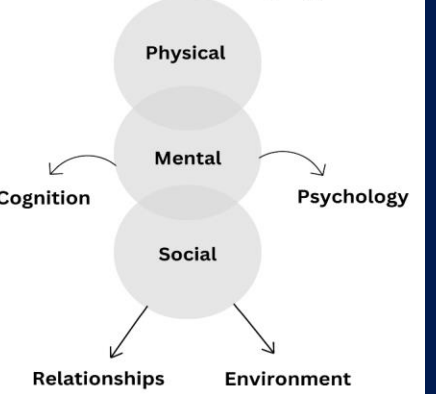
RESIST!

CHANGE



Revised Health, Well-being, Role Functioning

Exhaustion, Chronic Stress, Negative Coping



DEVELOPMENT OF THE FIREFIGHTER WORK LIMITATIONS



FIREWELL



- Current self-report questionnaires of work limitations are not useful for assessing firefighter work limitations.

Journal of Occupational Rehabilitation
<https://doi.org/10.1007/s10926-018-9778-6>



Work Functioning Among Firefighters: A Comparison Between Self-Reported Limitations and Functional Task Performance

Joy C. MacDermid^{1,2} · Kenneth Tang³ · Kathryn E. Sinden⁴ ·

[Rehabil Res Pract.](#) 2020; 2020: 1942513.

Published online 2020 Nov 8. doi: [10.1155/2020/1942513](https://doi.org/10.1155/2020/1942513)

PMCID: PMC7669334

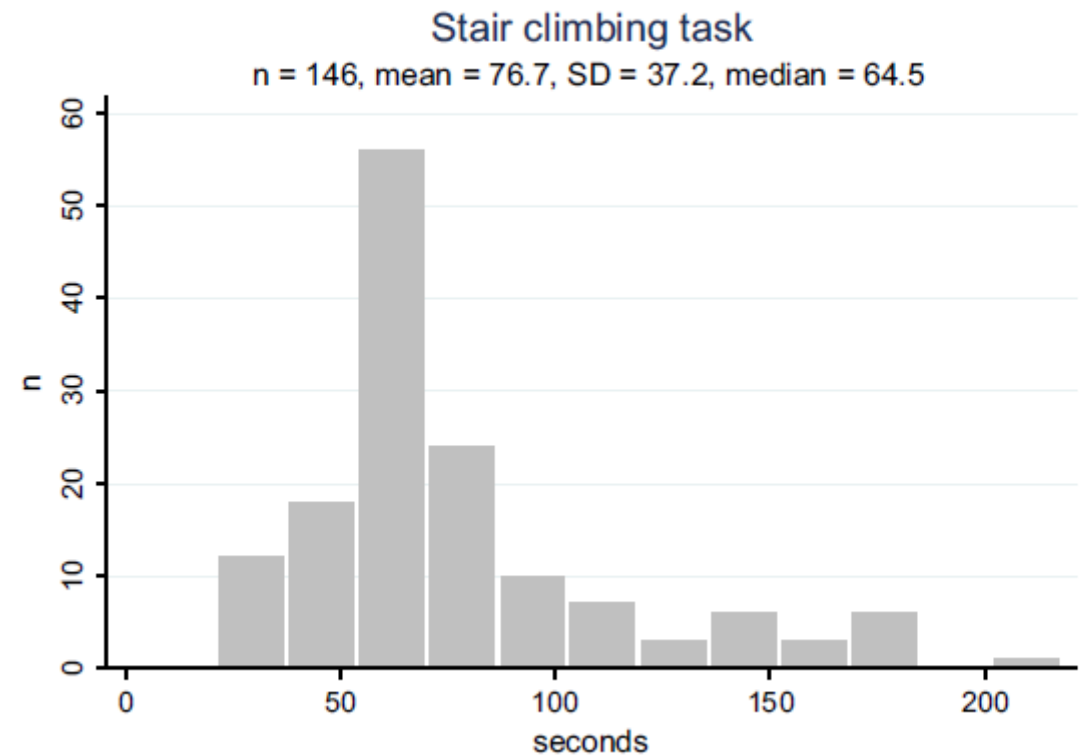
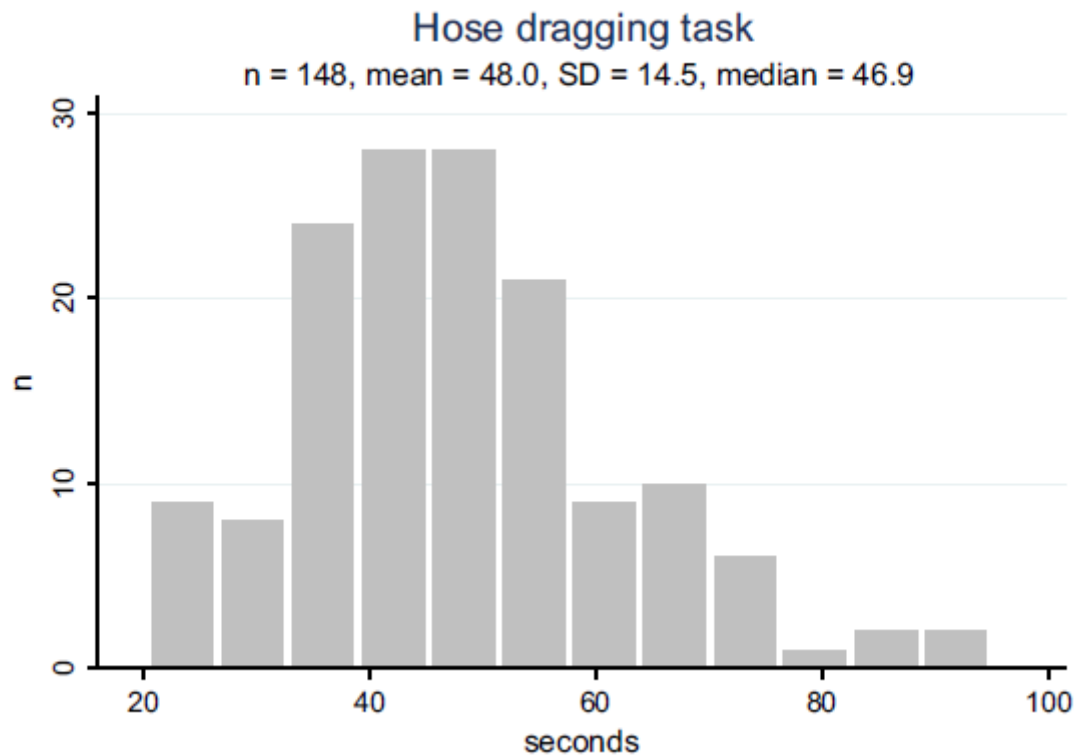
PMID: [33224531](https://pubmed.ncbi.nlm.nih.gov/33224531/)

Distribution of Number, Location of Pain and Comorbidities, and Determinants of Work Limitations among Firefighters

[Goris Nazari](#),^{1,2} [Temitope A. Osifeso](#),³ and [Joy C. MacDermid](#)^{1,2,3,4}



TESTING OF HOSE DRAG AND STAIR CLIMB IN EQUIPMENT



- Measuring work limitations can help with evaluating the impact of interventions
- Maybe helpful in the RTW process

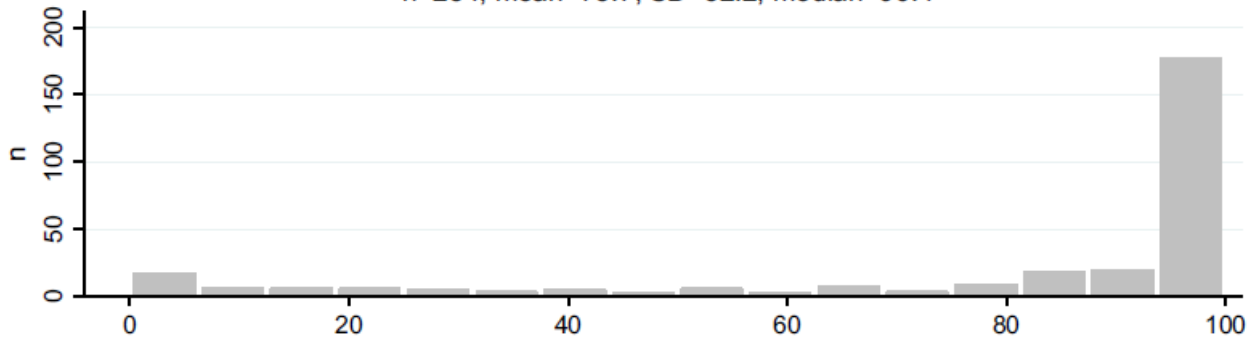
DIFFICULT	All of the Time (100%)	Most of the Time	Half of the Time (50%)	Some of the Time	None of the Time (0%)	Does Not Apply to My Job
a. Get to work on time	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
b. Stick to a routine or schedule without having to rearrange your work tasks	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
c. Work without taking frequent rests or breaks to avoid discomfort	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
d. Work the required number of hours	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
e. Handle very demanding or stressful work situations	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6



WLQ SUBSCALES

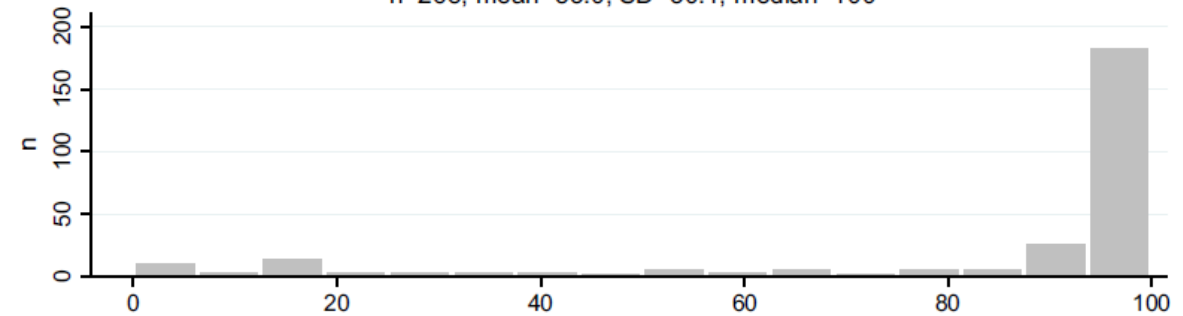
Physical Demands Subscale

n=284, mean=78.7, SD=32.2, median=96.4



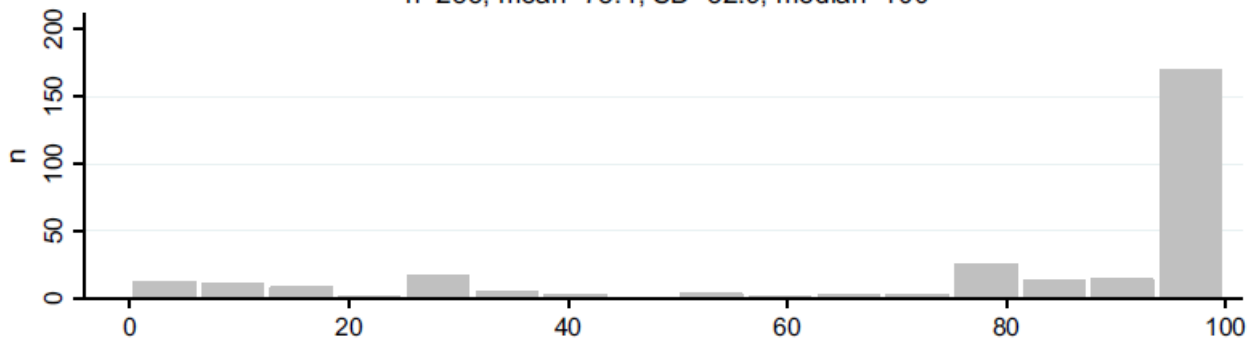
Work Scheduling Subscale

n=268, mean=83.0, SD=30.1, median=100



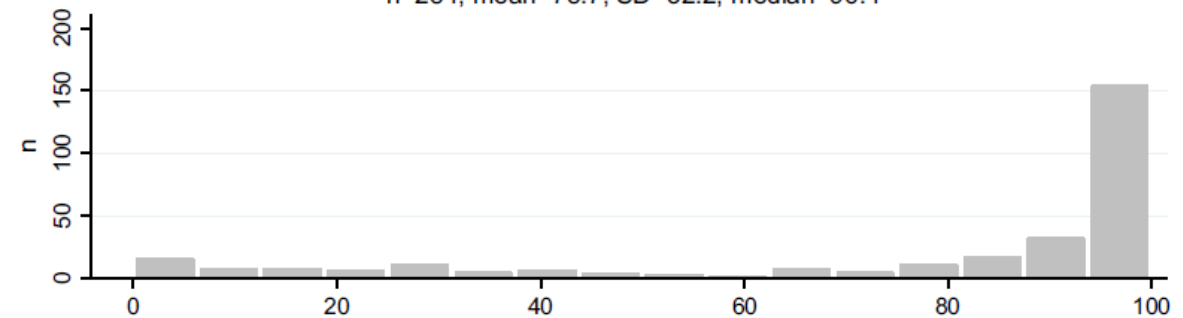
Mental Demands Subscale

n=285, mean=78.4, SD=32.9, median=100



Output Demands Subscale

n=284, mean=78.7, SD=32.2, median=96.4



PICK THE RIGHT TOOL FOR THE JOB

CS UNITEC™ EX1203-1850B FIREMAN AXE PICK HEAD 4LBS COPPER BERYLLIUM W/ NUPLA HANDLE

AA Item#: EX1203-1850B

CS Unitec Part#: EX1203-1850B

Manufacturer: CS Unitec



CS Unitec™ EX1203-1850B Fireman axe Pick head 4lbs Copper Beryllium w/ Nupla Handle Non Sparking Non Magnetic Utility Tools Hatchets/ Axes

This item qualifies toward free freight | Free ground shipping on qualified web store order \$250.00 and over!

Image may not be exact product match.

\$617.65

Per 1 Piece Package

\$617.65 Per Piece



Camping Axe, 15" Hatchet for Wood Splitting and Chopping, Gardening Small Axe Wooden Handle Tools with Sheath for Camping, Hiking (15inch)

Brand: Toolzeen

3.7 ★★★★★ 5 ratings

\$16⁸⁰

Get **Fast, Free Shipping** with Amazon Prime

FREE Returns

Item Generation (Qualitative)

- Interviews: 21 firefighters (15 males, 6 females).
 - Alberta, British Columbia, Nova Scotia, Ontario, Prince Edward Island, Quebec
- Nominal group exercises: 20 firefighters at a provincial firefighter conference.
- Items generated were categorized into the domains.

- Survey: 53 firefighters evaluated the relevance of the items and the frequency with which the tasks were performed.
- Content analysis - items were classified as:
 - strong potential,
 - questionable,
 - not appropriate.
- Item pool refined and clarified by a panel of expert measurement researchers and firefighters.



Firefighter Work Limitations Questionnaire (FF-WLQ-36)

Think about your recent performance of the firefighting tasks listed below. Rate how much you were limited in your ability to do your usual firefighting tasks.

Check "Does Not Apply" if the question asks about something that is not part of your job.

How much were you limited?	Not Limited at all (0%)	Limited some (25%)	Limited to half (50%)	Limited a lot (75%)	Unable to do (100% limited)	Does Not Apply
1. Put on and wear PPE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Put on and wear SCBA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Perform CPR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Lift/carry heavy tools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Enter/exit fire truck and load/unload equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Fire suppression tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Use axes, nozzles, ropes, door breaching equipment, extrication tools, chainsaws, and other firefighting equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Climb multiple floors wearing PPE and/or carrying heavy equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Work at heights and/or on ladders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Forcible entry, demolition, or prescribed/controlled burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Victim extraction, carry, drag, or lift	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Enter/exit fire scene; or bailouts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 35 items
- 5 domains of work:
 1. physical,
 2. social/interpersonal,
 3. cognitive,
 4. emotional,
 5. routines/time management

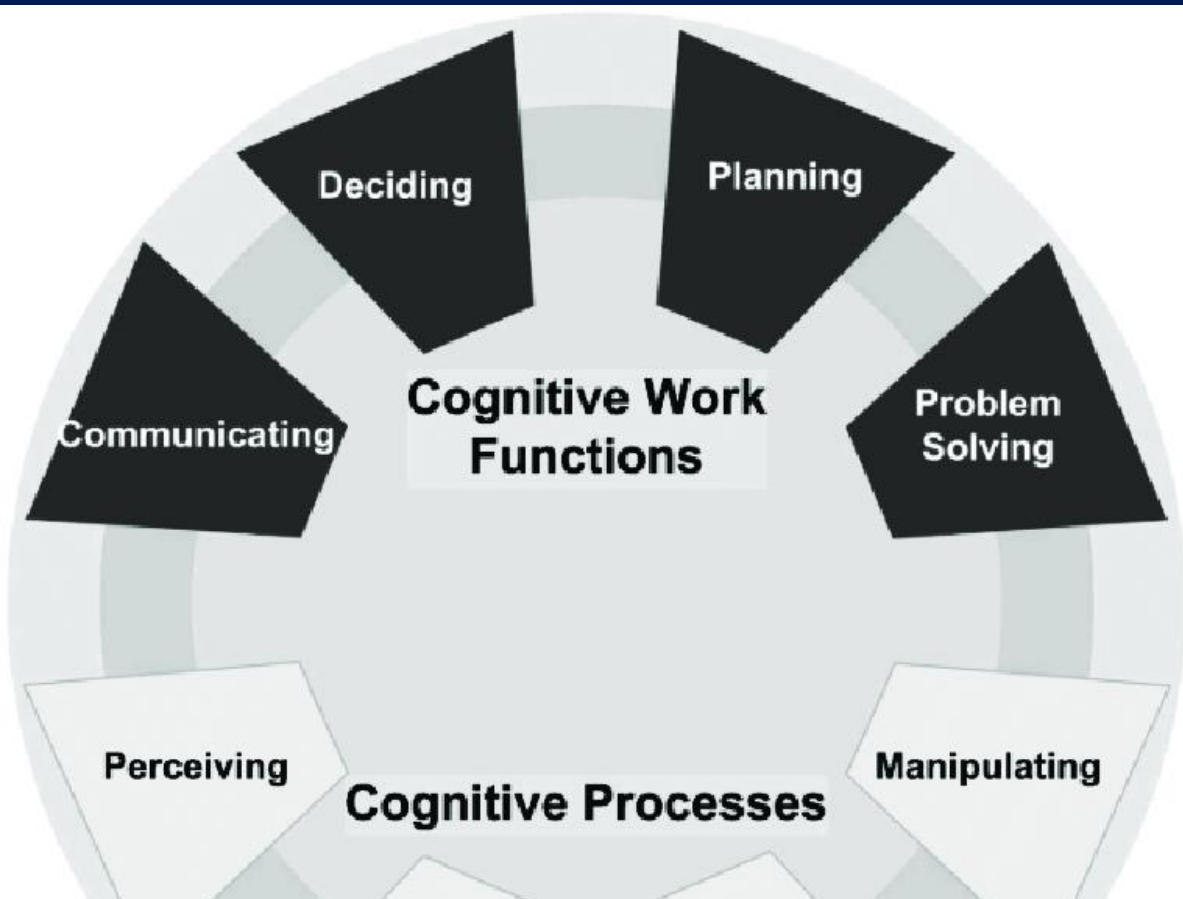
PHYSICAL TASKS



How much were you limited?	Not Limited at all (0%)	Limited some (25%)	Limited to half (50%)	Limited a lot (75%)	Unable to do (100% limited)	Does Not Apply
1. Put on and wear PPE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Put on and wear SCBA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Perform CPR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Lift/carry heavy tools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Enter/exit fire truck and load/unload equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Fire suppression tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Use axes, nozzles, ropes, door breaching equipment, extrication tools, chainsaws, and other firefighting equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Climb multiple floors wearing PPE and/or carrying heavy equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Work at heights and/or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



COGNITIVE WORK



30. Remember specific training (e.g., equipment), protocols, operating procedures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Analyze personal risks on scene; situational awareness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Make critical decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Transition from one task to another quickly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Prioritize actions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Focus on tasks at hand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Problem-solve in stressful situations	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

EMOTIONAL WORK

How much were you limited?	Not Limited at all (0%)	Limited some (25%)	Limited to half (50%)	Limited a lot (75%)	Unable to do (100% limited)	Does Not Apply
24. Manage my emotions during critical incidents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Manage my emotions after a bad call	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Keep out distracting memories/emotions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Avoid compassion fatigue and burnout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Manage emotions related to calls involving children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
29. Manage stress response from alarms/emergency calls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



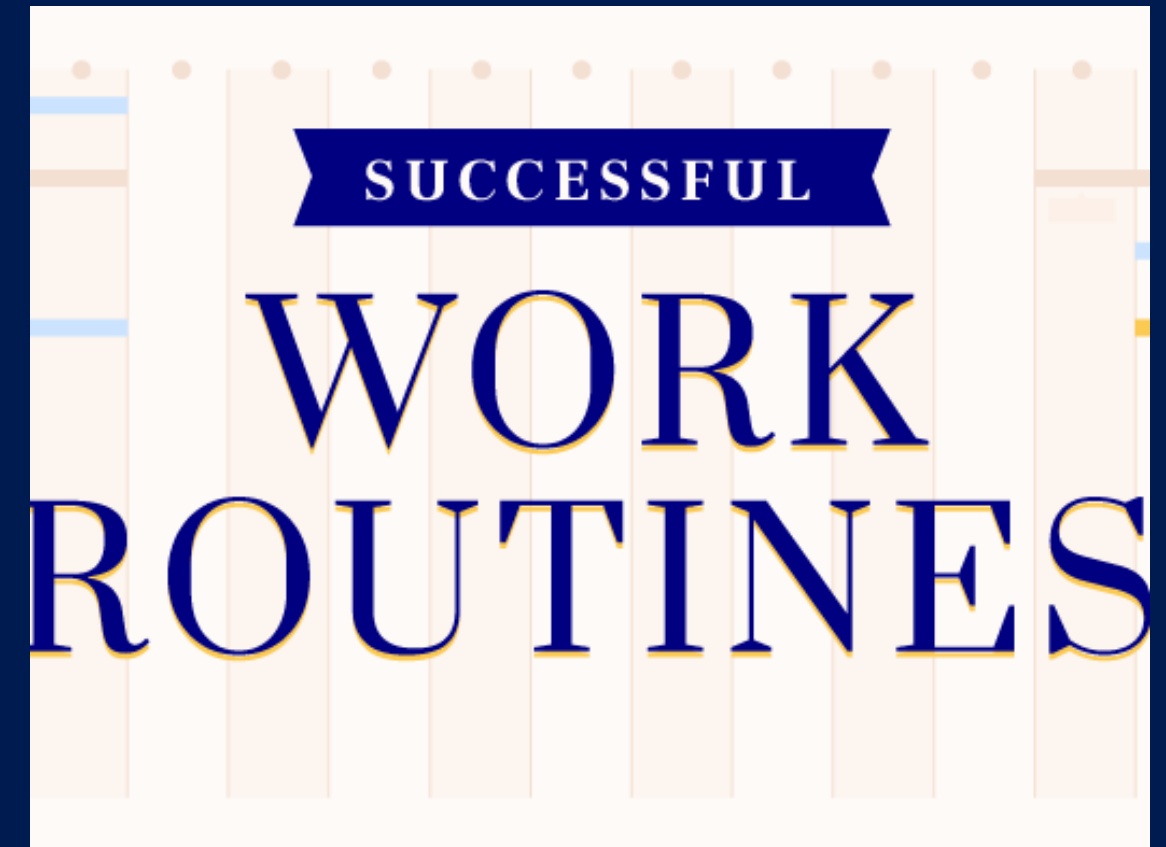
INTERPERSONAL

20. Work as a team in the field with other firefighters and public safety personnel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. Help with debriefing or support of fellow firefighters after stressful situations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. Maintain positive relationships with firefighter colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. Maintain professional and compassionate interactions with the public	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



WORK ROUTINES

13. Able to manage full shift/call	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Complete all drills or training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Maintain firehouse/ department routines (e.g., truck and equipment checks, general maintenance)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Keep up the pace for urgent tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Maintain expected speed and proficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Complete tasks at the level needed to protect public safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Earn/maintain respect	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>





QUESTIONS FROM FIREFIGHTERS

- There are so many programs how do we choose?
- Can we implement Resilient Minds in different communities and scale it up?

Comparison of Mental Health Programs and Update of Resilient Minds™ : A qualitative study of participants and trainers

Dr. Joy C. MacDermid, Sara M. Stretton, Margaret Lomotan, Shannon C. Killip, Steve Fraser

- 14 participants
 - 10 career firefighters
 - 3 volunteer firefighters
 - 2 firefighter staff
 - 8 women, 5 men
 - Age: mean= 47 (min=30, max=66)
 - Years of service: mean=18 (min=5, max=32)

Program combinations	Number of participants
RM and R2MR	8
RM and Working Mind	1
RM and BOS	1
R2MR and BOS	2
RM, R2MR , BOS, and another	1
RM, R2MR, BOS, and Working Minds	1

RM= Resilient Minds, R2MR= Road to Mental Readiness, BOS= Before Operational Stress



Theme 1: Program Similarities and Distinctive Features

Program Similarities

Use of various teaching methods: lecture style, group discussion, role-playing, group exercises

Similar program goals: promoting mental resiliency, mental health awareness, and destigmatization

Similar skills: recognition of mental health issues, how to get assistance, building resiliency, effective communication

Distinct Program Features

RM is largely group participation

R2MR is largely lecture style

BOS is largely lecture style

In-person, group interaction/role-playing, and fire-specific courses were the most effective and engaging delivery and teaching methods

It was really built for firefighters... all the examples, discussion, everything was about firefighting. You could speak our language. We didn't have to try to explain anything to somebody when we were talking about situations because we just all understood, because it was our similar language, experiences, [and] situations that we deal with.

[R2MR] seemed very vague... I couldn't connect to how it was going to apply to what I was doing... [R2MR] didn't have that same feeling of Resilient Minds, because the language and the different examples that [R2MR] were using were military specific, so it didn't have that same effect.

Theme 2: Program Preference

- 78% of participants who took RM preferred RM
- No concerns about course content across all programs
- All programs were viewed as relevant
- 57% of participants believed taking multiple mental health courses is the best approach to mental health training

Program combination	Program preference
RM and R2MR <i>I never felt like taking already know this. I don't</i>	6/8 preferred RM (context competency and practical skills) <i>all four that that it was like 'Oh, I</i>
<i>think Resilient Minds is a fantastic program, I think</i>	0/2 preferred R2MR (shorter course) <i>felt like it was either new and interesting, or it was</i>
<i>that it's what's been needed. I've been in emergency</i>	1/8 no preference (all programs are relevant) <i>services for 16 years now, and I've never had a program</i>
<i>kept it very interesting... mental health education isn't a one</i>	0/1 preferred BOS (context competency and practical skills) <i>stop shop, people and don't have to bring... there's so many</i>
<i>well as people that have delivered to even though</i>	0/1 no preference (all programs are relevant) <i>R2MR is a good program, but I think for firefighters</i>
<i>learning the R2MR program, and then and type moves to ..</i>	0/2 no preference (all programs are relevant) <i>Resilient Minds is definitely a superior program that</i>
<i>do the other one later ...</i>	0/2 no preference (all programs are relevant) <i>has more practical skills and information in it</i>
RM, R2MR, BOS, and Resilient Minds <i>in in different ways. All of the knowledge is good, and [they</i>	1/1 no preference (all programs are relevant) <i>all] build on each other</i>
RM, R2MR, BOS, and Minds <i>working</i>	0/1 no preference (all programs are relevant) <i>working</i>

Theme 3: Barriers and Program Improvements

- 57% of participants expressed that the largest barrier to taking courses is the cost
- R2MR is free for public safety personnel that are currently employed

[Programs and learning resources] have limitations because they're only as current as the guide, and nobody has money to actually update these things and send them out to everybody who has them.

Choosing a Program: Course topics

Course topics	RM	R2MR	BOS
Attitude toward mental illness	Large focus	Covered	Briefly or indirectly covered
Stigma	Covered	Covered	Not covered/don't recall
Communication skills	Main focus	Main focus	Participants unable to reach consensus
Recognition of stress/mental health symptoms	Large focus	Main focus	Covered
Help seeking behaviors	Covered	Covered	Covered
Gender considerations	Not covered	Not covered	Not covered
Treatment Options	Covered	Covered	Participants unable to reach consensus

Choosing a Program: General Course Overview

	RM	R2MR	BOS
General course time commitment*	8-10 hours	24-26 hours over 4 days **	Online/education: 8 hours Intensive: 2-hours/week for 8 weeks
Delivery format*	Virtual and in-person	Virtual and in-person**	Online: virtual only Education: both available Intensive: in-person only
Main teaching method	Group participation/application	Lecture style	Lecture style
Target of learnt skills	Yourself, peers, civilians	Unable to reach consensus (3 participants said yourself, 3 participants said peers)	Yourself
Application into work/personal life	Effective communication with peers, civilians, and loved ones	Recognizing mental health issues and creating a common language to talk about it among peers	Mostly theoretical and lacks practical application. Understanding the brain has helped with destigmatization
Unique characteristics	Cultural competency: "created by firefighters for firefighters."	Use of the mental health continuum: created a common language among peers	Taught by mental health professionals
	Focuses on self, peers, and civilians		

Note: Results are based on participant perceptions. * Obtained from program staff/websites, ** is based on the currently available version of R2MR from CIPSRT, this was **NOT** the version taken by our participants, see slide 5 note.

Discussion: future programs/iterations

- Program descriptions should be comprehensive
 - Including: main teaching style, focus of the program, overall cost, topics and time spent on each
- Instructors should include a peer and mental health professional ⁶
- Interactive and scenario-based ⁶ learning
- Content specific to firefighters ⁶
- Mental health training should be spread out through one's career in a tiered approach ⁶
- Virtual programs should be interactive and delivered over multiple sessions ⁶
- Programs should be in person where possible ⁶
- Mental health education should be incorporated into salaries and working hours ⁶



MENTAL HEALTH

ADDICTIONS

POLICY

PROVINCIAL PROGRAMS

NEWS

DONATE



ABOUT RESILIENT MINDS

TRAIN-THE-TRAINER WORKSHOP



RESILIENT MINDS COURSE

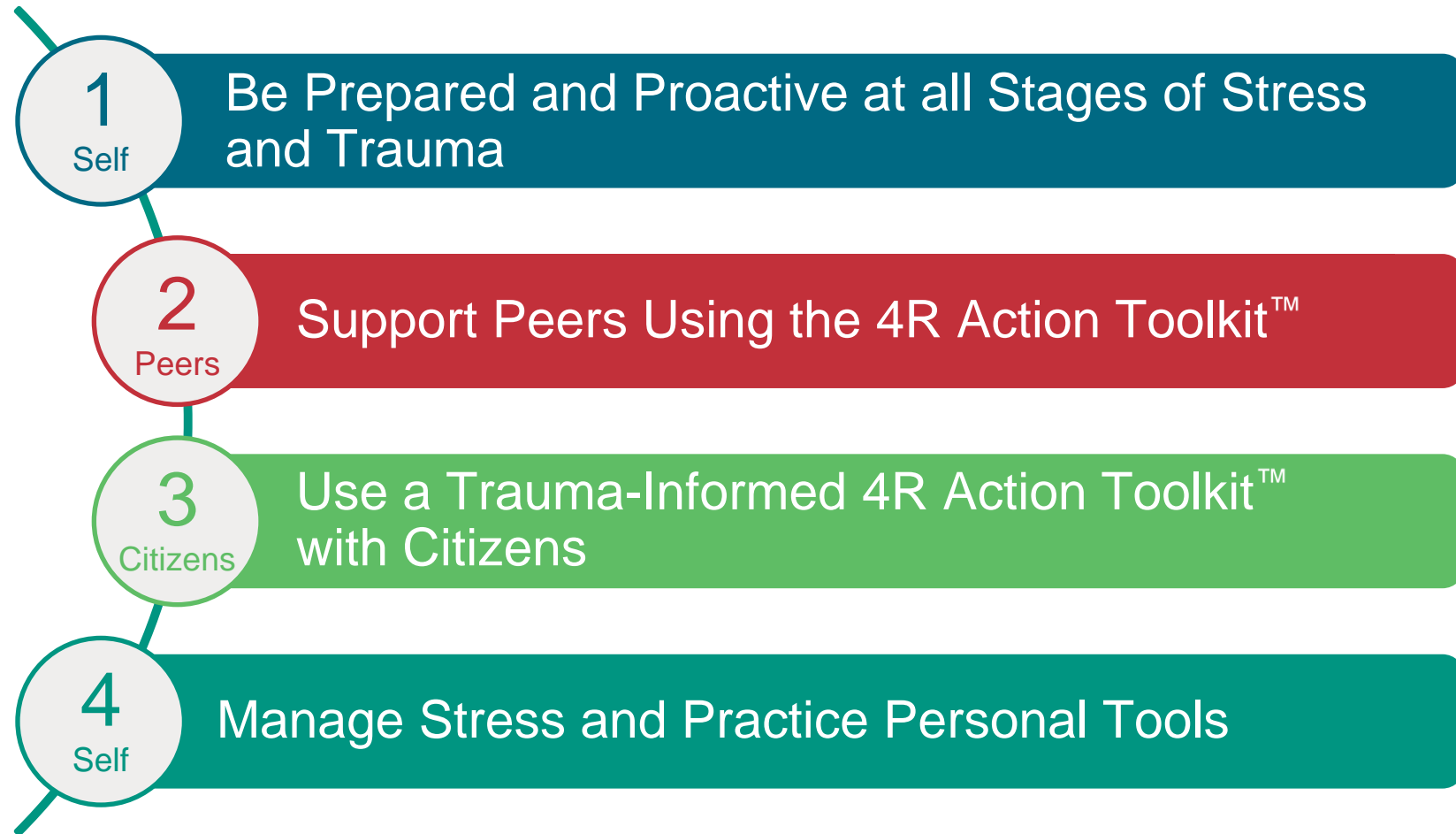


Resilient Minds

An effective, sustainable approach to psychological health training



Resilient Minds™ Overview



Train-the-trainer

2 Instructor Trainers

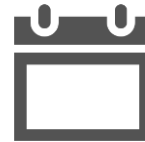
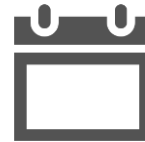
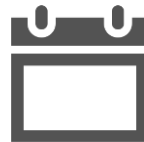


Fire Fighter



CMHA

3-days
in-person



Up to 20
Peer Instructor
Candidates



DELIVERY

Current status in capacity (across Canada)	Resilient Minds - English	Resilient Minds - Indigenous First Responders	Resilient Minds – French
Lead Instructors	2	2	2
Instructor Trainers	43	13	3
Peer Instructors	Canada = 561 Ontario = 209	8	2
Frontline Firefighters	Canada = 4,443 Ontario = 1,622	311	174

Contact: jmacderm@uwo.ca

Questions?

Tell us - What would like us
to do next?

Other Comments