

**Development of a Mental Skills Training Intervention for the Canadian Special Operations
Forces Command: An Intervention Mapping Approach**

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Abstract

Mental skills training (MST) has been well documented in the sport and exercise literature, and there is increasing interest in MST interventions for military populations. Although the considerable research on MST interventions in sport contexts provides a valuable framework from which to develop programming for other high performance contexts, the military, and in particular the Special Operations Force (SOF), represents a unique population for which there is less available evidence for the design and implementation of effective mental performance programming. In this manuscript, we describe the use of Intervention Mapping (IM: Bartholomew Eldridge et al., 2016) in the development and implementation of a customized MST package for the Canadian Special Operations Command. The six stages of the IM protocol were systematically applied to develop the program: 1) needs assessment, including a literature review and focus group consultation; 2) identification of program outcomes and objectives; 3) program design, including the selection of theory-driven and evidence-based methods and practical strategies; 4) program production including pilot testing; 5) planning for adoption, implementation and sustainability, and 6) program evaluation. Although time-consuming, IM is a valuable framework for the development of customized MST for military personnel. This approach offers a logical, methodical approach to integrate relevant theory into program development. Additionally, this process enables ongoing consultation with the end-user, facilitating effective implementation and user acceptance. Finally, because IM involves a highly transparent approach to program development, it enables effective replication of intervention development.

Keywords: behavior change techniques; behavior change wheel; mental toughness; performance psychology; theoretical domains framework

Development of a Mental Skills Training Intervention for the Canadian Special Operations Forces Command: An Intervention Mapping Approach

The effectiveness of mental skills training (MST) in facilitating performance is well documented in the sport and performance psychology literature, with both formative (Greenspan & Feltz, 1989) and contemporary (Brown & Fletcher, 2017) meta-analyses demonstrating that psychological interventions are effective in enhancing human performance. From an applied standpoint, the systematic training and development of cognitive, emotional, and behavioral techniques or processes (mental skills) that are activated in response to environmental stimuli to achieve valued outcomes (e.g., confidence, high quality decisions) has become commonplace in many nations and among athletes of diverse sport types. Mental performance specialists are regularly contracted by individual athletes, teams, and sport organizations to deliver systematic training in the mental performance sphere. However, there has been considerably less attention dedicated to understanding the effect of MST interventions with military populations (e.g., Adler et al., 2015). This underutilized aspect of performance excellence within military contexts is somewhat perplexing, given the high risk imparted on service personnel both during training and on operational deployment. The Special Operations Forces (SOF), in particular, are an understudied subset of the broader military population. Despite increasing reliance on these specialized units by many nations (Ogle & Young, 2016; Russell et al., 2016), there is little published information about factors affecting the wellbeing of SOF operators (Skare, Hopkins & Solberg, 2017).

Several commentaries have effectively depicted a requirement for greater collaborative research efforts between the two fields of military and sport psychology (e.g., Goodwin, 2008; Janelle & Hatfield, 2008), and encourage the alignment of research efforts across the two

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disciplines in order to better inform training for both populations. Numerous constructs are critical to performance optimization in both sport and military contexts, such as pre-performance preparation, decision-making, attitudes, stress regulation, teamwork, leadership, situational awareness, motivation, confidence, self-regulation (e.g., attention and emotion), expertise, resilience and mental toughness (Dewiggins, Hite, & Alston, 2010; Goodwin, 2008; Janelle & Hadfield, 2008). As there is considerably more research on MST in sport settings relative to military contexts, this literature offers a useful backdrop upon which to identify important mental skills for integration into training for military personnel, and in so doing consider the robustness of certain skills across performance settings. Certainly, similarities may be drawn between the essential skillset, performance tasks, and the psychological experiences of elite athletes and soldiers. Both arenas involve performing in complex, dynamic environments, where the performers' primary objective is to achieve some tactical advantage over an opponent (Ward et al., 2008). The nature of the 'competition' environment also shares parallels across sport and military contexts; for example, real and perceived consequences of positive and negative outcomes, personal risk involved with participating, ambiguity and lack of predictability surrounding performance outcomes, and a high degree of uncertainty and perceived threat (Dewiggins et al., 2010; Janelle & Hadfield, 2008). A significant commonality between these two domains, as it pertains to MST, is the requirement for both athletes and service members to maintain sufficient cognitive and behavioral capacities to facilitate optimal performance in the face of considerable stress or adversity. Cognizant of these similarities and the potential value of sport psychology for service members, the United States Military Academy established the Centre for Enhanced Performance as the primary means by which to deliver MST to cadets using

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knowledge from applied sport psychology (Meyer, 2018; Zinsser, Perkins, Gervais, & Burbelo, 2014).

There are also considerable differences between sport and military performance contexts. For instance, in comparison to athletes, soldiers must maintain competency across a wide variety of distinct tasks (Goodwin, 2008). In addition to mastering common soldier skills (e.g., marksmanship, urban operations), military members must typically maintain proficiency in numerous other qualifications or specialized skills as required by their trade, element or unit. Perhaps most notably, the scale of stress inherent to many military tasks and the magnitude of real risk assumed by service members, including threats to individual safety and exposure to potentially traumatizing events (Adler, McGurk, Stetz, & Bliese, 2003) is significantly greater than that experienced by sport participants (Janelle & Hatfield, 2008). Military personnel also often spend extended periods of time away from their home environments and primary sources of social support (e.g., family, friends) in order to complete field-based training activities and operational deployments for warfare (e.g., combat) or peacetime (e.g., humanitarian) missions (Shuffler, Pavlas, & Salas, 2012). For these reasons, it may be argued that the challenges faced by military members due to conditions of service exceed those experienced by the typical athlete, regardless of sport type or real or perceived consequence to underperformance. As such, researchers interested in MST within military contexts should not rely solely on the sport performance literature.

Historically, research in the area of stress and its effects on human performance and functioning have been wide reaching within military psychology compared to the sport literature, with lines of inquiry spanning such areas as identifying prevalence of adverse outcomes following combat exposure (Hoge et al., 2004), understanding barriers to mental health care

seeking (Vogt, 2011), and examining the effect of early intervention measures following soldiers' return from deployment (Adler, Bliese, McGurk, Hoge, & Castro, 2009). Scholars also have examined psychological qualities considered essential for optimal performance with military contexts, such as mental toughness (e.g., Arthur, Fitzwater, Hardy, Beattie, & Bell, 2015; Gucciardi et al., in press), grit, resilience resources and cognitive abilities (Farina et al., 2019). However, despite being first mentioned as a means to enhance performance and well-being in military populations over three decades ago (Larsson, 1987), MST remains an under-examined area in the military literature, relative to that which exists in other areas of military performance psychology and the sport psychology literature. It is therefore unsurprising that there has been a recent surge of investment by military enterprises as well as effort among the academic community in explicit MST, either as standalone training consistent with traditional models of sport psychology intervention, or within integrated initiatives aimed at fostering resilience. This renewed focus on proactive, performance-focused approaches to mental skills development is likely due to a recognition of the various demands placed on service personnel on a predictable, recurring basis and the regular occupational stressors under which they are regularly required to perform in garrison, training and deployed environments (Adler et al. 2003). These examples represent an important departure point – when considered alongside the sport performance literature – for researchers and practitioners interested in developing MST programs for military personnel.

To date, the application of mental skills (e.g., imagery, self-talk, goal setting) has been included within broader training programs emphasizing mental health education and stress management training (e.g., Cornum, Matthews, & Seligman, 2011; Fikretoglu, Liu, Zamorski & Jetly, 2016; Taylor et al., 2011). A primary focus of many of these programs is on teaching

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copied skills to handle situations of acute or ongoing stress, with content tailored specifically to the combat experience. Some initiatives also aim to promote resilience, foster mental fitness, enable soldiers to maintain performance in the face of operational stress, and to ensure soldier wellbeing in both the short and long term. Indeed, programs of this nature have tended to use various interrelated terms to describe program objectives, including but not limited to resilience (Cornum et al., 2011; Reivich, Seligman & McBride, 2011), MST (Adler et al., 2015), mental toughness (Fitzwater et al., 2018), and hardiness (Khoshaba & Maddi, 2001). Castro and Adler (2011) suggest that “good mental health training should be the same thing as good resilience training” (p. 326), speaking to the interrelated nature of these concepts, each having relevance to performance, stress management and/or wellbeing. Many of these programs have been implemented with the common overarching goal of equipping personnel with cognitive and behavioral techniques to manage the demands of military service effectively, with many grounded in positive psychology (e.g., Seligman & Csikszentmihalyi, 2000) and drawing on fundamental concepts of cognitive behavioral therapy (see Hollon & Beck, 1994). Several studies within military populations and other high-risk occupations such as police officers (e.g., Anderson et al., 2015; Arnetz, Nevedal, Lumley, Backman, & Lublin, 2009) have examined the effects of MST on psychological (e.g., mental skills usage) and behavioral (e.g., performance) outcomes. The results of the aforementioned studies are promising, as they provide evidence for increases in psychological skill usage (Adler et al., 2015; Fitzwater et al., 2018), enhanced performance (Arnetz et al., 2009), effective management of physiological responses (Anderson et al., 2015), and increased mental toughness (e.g., Fitzwater et al., 2018).

This recent heightened attention in resilience and performance-focused research and programming appropriately coincides with increased interest on the part of military organizations

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to implement such training for their constituents. The current intervention resulted from such interest by Canadian Special Operations Forces Command (CANSOFCOM). In response to a request from senior leadership, internal stakeholders were tasked with developing a relevant, customized, evidence-based MST program, specific to this SOF community. The aim of this program was to provide soldiers with a cognitive and behavioral skillset to manage the demands placed on them effectively, thereby fostering resilience, enhancing performance, and promoting employment longevity in the SOF community. The development of such a program would involve drawing on the evidence-base in mental performance and MST, as well as best practice guidelines from other related initiatives conducted with the broader Canadian Armed Forces (CAF) population and allied nations, while being cognizant not to inappropriately generalize findings from programming and research conducted with other military agencies or conventional forces. In order to ensure this programming was tailored specifically to the target population, a framework was required to develop a customized training package based on the specific needs of CANSOFCOM members.

Intervention Mapping (IM; Bartholomew Eldridge et al., 2016) is a framework for program development, which is widely applied in the context of health promotion. The systematic process IM provides a step-by-step methodology to theory-informed program development. The approach includes six phases, each involving several tasks: 1) needs assessment, 2) identification of program outcomes and objectives, 3) program design, 4) program production, 5) program implementation plan, and 6) development of an evaluation framework. Central to the IM approach is the integration of relevant social and behavioral science theory into the planning, implementation, and evaluation processes. The IM approach is both an iterative and cumulative process, rather than a linear planning procedure. Hence, although each step is

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informed by the findings of the preceding steps, the planning process moves in both directions as new themes evolve and information is obtained. A noted strength of the IM approach is an emphasis on partnering with members of the target population with inclusion of community members from outset of program planning and through all stages of the program development and implementation. This inclusion of community members from the outset of program planning can mitigate a top-down or outsider approach (Minkler, Wallerstein, & Wilson, 2008).

IM has been applied across a wide variety of occupational contexts and health conditions such as workplace programs to improve presenteeism (Ammendolia et al., 2016), mHealth programs for physical activity and sedentary behavior change (Direito et al., 2018), serious gaming for cyberbullying (DeSmet et al., 2016), and behavioural programs for adults with type 2 diabetes (Miller, Pawelczyk, Cheavens, Fujita, & Moss, 2016). Within the context of sport and exercise settings, IM has been applied primarily in the development of physical activity promotion interventions (e.g., Friederichs et al., 2014; McEachan, Lawton, Jackson, Conner, & Lunt, 2008; Prins, van Empelen, Beenackers, Brug, & Oenema, 2010), with one exception focused on sport injury prevention programs (Collard, Chinapaw, van Mechelen & Verhagen, 2009). Importantly, IM has been shown to be a successful approach for planning, implementing, and evaluating culturally relevant and effective complex interventions in areas such as disease prevention (Garba & Gadanya, 2017) and cancer (Lamort-Bouché et al., 2017).

Given the noted strengths of the IM framework, in particular the inclusion of stakeholders and end users, the deliberate consideration of the ecological context in which interventions will be delivered, and the iterative versus linear approach to intervention design, IM represents an appropriate framework through which to design a tailored intervention in the context of real-world military mental skills training. Our goals in this paper are to describe the development

process within the context of the IM protocol, and showcase an exemplar of the product of this process via our data collection efforts. Achieving this goal offers two important contributions to the literature. First, as there exists no published application of the IM approach in military settings or in the context of sport psychology interventions, we introduce the IM approach to the sport psychology community in this paper and provide an exemplar for researchers who may be interested in applying this approach. Second, we articulate information regarding key processes and decisions made during the development of a complex intervention focused on MST that provides valuable knowledge for the field (e.g., links between active ingredients, intervention components, and theoretical mechanism of change).

Methods

Step 1: Needs Assessment

Step one of the IM process is comprised of the following learning objectives and tasks: establishing a planning group; conducting a needs assessment; describing the context of the intervention (i.e., population, setting and community); and stating program goals based on analysis of problems and causal factors (Bartholomew et al., 2016). The needs assessment, or problem analysis, aims to identify: 1) the specific gaps or needs to be addressed in the intervention, 2) how it might be delivered for optimal effectiveness (e.g., with consideration for contextual factors such as population, setting), and 3) the desired outcome(s) of the intervention. This phase included establishing working groups to determine the needs of CANSOFCOM constituents, conducting focus groups with the working group, and completing a rapid review of relevant literature. This review included both academic and other available published works relevant to military and, in particular, the SOF community (i.e., technical reports and white papers).

Establishment of working groups. The IM approach suggests at least one working group is necessary to conduct a needs assessment and to develop, implement, and evaluate an intervention. Participation by program end-users from the outset is encouraged to ensure the program addresses areas of importance to the community of interest. To that end, both a working group of CANSOFCOM end-users and a multidisciplinary advisory committee were constructed in order to define program objectives and to identify the specific training needs and inform intervention development (i.e., delivery method, practical strategies, implementation and feasibility). The working group was comprised of 13 male active duty members representing the various units in CANSOFCOM, including both non-commissioned members and officers, ranging in rank from Corporal to Warrant Officer, and Captain to Major. The advisory committee included civilian and military stakeholders representing the following disciplines: mental performance, social work, clinical psychology, military chaplaincy, and general medicine. The working group and advisory committee were constructed in order to inform this initiative from the perspective of the CANSOFCOM member, and military service providers, respectively. The two committees were initially co-chaired by two experts in military resilience training (KG & SB), both with twenty years of experience in mental health fields, and over ten years of experience in developing training and curriculum in resilience and mental health education for the CAF.

Bartholomew Eldridge et al. (2016) suggest that the composition of a planning group may need to be reconsidered through the program development process to ensure all required stakeholders are represented. Indeed, the composition of this working group evolved as the needs assessment was conducted and program objectives were identified. Specifically, as program needs were identified, the initiative evolved to emphasize mental performance optimization with

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underpinnings of mental health education. As a result, the working group was later co-chaired by senior representatives from the CAF Directorate of Mental Health and the CANSOFCOM Human Performance Research & Development divisions. Civilian mental performance specialist positions were created, which would be responsible for program development, implementation and evaluation. The advisory committee was merged with the working group in order to achieve several key outcomes. First, the merging of subject matter expertise and military experience ensured that the professionals in the advisory committee, who were tasked with informing but not developing the intervention, were provided the opportunity to view the program goals and content as it evolved. Doing so enabled transparency across the full spectrum of mental training and psychosocial services with respect to program objectives and deliverables. Secondly, merging these groups allowed direct correspondence pertaining to this program between stakeholders employed at the strategic level and serving members who offered relevant insight regarding challenges imparted on the SOF community. Throughout the needs assessment phase, and due to operational requirements, some representatives were unavailable for planning sessions and therefore replaced by another representative from that unit or section.

Planning/advisory group consultation. Six meetings were held with the planning/advisory group over an 18-month period to determine training requirements from an end-user perspective, and to identify foreseeable barriers and enablers in developing and delivering a customized training to this elite military community. Specifically, the objectives of the planning group meetings were to identify program requirements, and to evaluate the feasibility of developing and delivering a customized, in-person intervention. An additional priority in this step was to identify and mitigate any logistical constraints to program implementation (i.e., feasibility) and to identify challenges and opportunities with regard to

eventual acceptance of the program (i.e., operator buy-in). The activities and outputs of the focus groups informed IM steps one through four of the IM process.

Literature review. A rapid review of the effectiveness of MST interventions was conducted in order to identify the active ingredients involved in previous interventions with military populations. The rapid review is a technique commonly conducted by government policymakers, healthcare institutions, and health professionals to streamline the traditional literature review process (Ganann, Ciliska, & Thomas, 2010). This type of literature search is commonly employed when time and/or resources are limited, thus prohibiting the use of other, more comprehensive searches such as a scoping or systematic review. For the purposes of this program, the rapid review examined previous MST interventions in both sport and military populations. This review aimed to identify: 1) *what* the intervention should comprise (i.e., the specific cognitive and behavioral change components that were found to be effective); 2) *who* should be delivering the intervention (i.e., certified professionals or active military personnel); and 3) *how* to do so to achieve greatest effect (e.g., delivering training in small groups compared to one-on-one training). A literature search was conducted using the following electronic databases: PubMed, PsycINFO and Web of Science. Search terms included “mental skills training”, “psychological skills training” “mental training”, “mental toughness”, “performance enhancement”, “resilience” and “military performance”. The review also included technical reports and white papers published by military institutions that are unavailable through electronic databases but which are available for release to the public.

Step 2: Identification of Outcomes, Performance Objectives and Change Objectives

The second step of the IM approach involved determining the desired behavioral and environmental outcomes that should occur as a result of program implementation. The aims of

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this step are to state expected performance objectives (i.e. specifically what a member would need to learn, do, or change to achieve the intervention outcomes) and specify relevant and changeable determinants for each behavioral or environment outcome. In this step, matrices of change objectives are created to state intended outcomes in the form of actual changes required within the determinants to achieve the performance objective. This step also included the identification of resource requirements for the delivery of the intervention within the context of military training and operational structure. Following the identification of program outcomes, specific performance objectives (i.e., skills, behaviors, environmental conditions) to support the outcome were identified. The pedagogical approach to mental skills instruction was to provide a range of evidence-based cognitive and behavioral skills in a non-prescriptive manner.

Step 3: Program Design

The third step of the IM approach involves identifying theoretically-informed methods considered relative to effective change in theoretical determinants. In this step, each behavioral determinant was mapped to a domain in the Theoretical Domains Framework (TDF; Cane, O'Connor & Michie, 2012), and Behavior Change Techniques (BCTs), and evidenced-based intervention methods were mapped against the various determinants, and operationalized into practical strategies that would achieve the intended program outcomes. The Behavior Change Wheel (BCW; Michie, van Stalen & West, 2011) and its functions broadly informed the intervention development. The BCW is a framework for designing behavior change interventions which integrates behavioral theory and facilitates the application of behavioral science to intervention development. The innermost layer of the BCW is the COM-B model, which depicts the behavior system as the interaction of *capability* (i.e. an individual's psychological and physical capacity to engage in the behavior), *opportunity* (i.e. all factors extrinsic to the

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individual that prompt or enable the behavior) and *motivation*, described as all brain process that energize and direct behavior. Thus, an individual must have the capability to perform and opportunity to do so, along with requisite motivation. The COM-B model is supported by the TDF, which is an integrative framework of theories of behavior change developed to facilitate integration of existing behavior change theory into intervention design. The second layer of the BCW includes nine intervention functions, which have been linked to the Behavior Change Technique Taxonomy (BCTTv1; Michie et al., 2013). A BCT is defined as “an observable, replicable and irreducible component of an intervention designed to alter or redirect causal processes that regulate behavior” (Michie et al., 2013, p. 82) and are considered ‘active ingredients’ of behavior change. The behavioral analysis was conducted using the BCW based on outputs from the focus groups, the rapid review of literature, and from the practical experiences of the program development specialists in delivering related psycho-education programs to populations of CAF members and performance enhancement training to athlete populations. Details of the behavior analysis using the COM-B model, associated TDF domains, intervention functions, specific BCTs selected, and practical intervention strategies is depicted in Table 1. In line with the iterative nature of IM, practical training strategies and implementation plans were discussed with the working/advisory group to gauge the relevance and feasibility of the training approaches from the perspective of the end-user.

Step 4: Program Production

In the fourth step of the IM process, all training materials were drafted and pilot tested for relevance, acceptability, and feasibility for the individual CANSOFCOM units. As this training content was developed largely by civilian specialists, several steps were taken to ensure that the training was relevant and relatable to the target population. First, formalized consultations with

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the joint working/advisory group were conducted ongoing as content was proposed and developed. Second, formal and informal consultation with the CANSOFCOM community (i.e., military members) occurred throughout the program production phase to ensure that content and delivery methods were suitable to the individual units included in the intervention, and to confirm contextual accuracy of practical teaching examples. Third, formal unit meetings were held in order to explain the intention of the initiative to senior leadership and to acquire context on the needs and culture of each particular unit. These program production steps aimed to confirm that program content was relevant, feasible, and acceptable, as well as unique (i.e., not covered elsewhere in instituted training packages), appropriate in degree of complexity for the target population, and suitable in terms of integration with existing training schedules.

Step 5: Planning for Adoption, Implementation and Sustainability

The fifth step involved planning for the adoption, implementation, and sustainability of the program in order to ensure the program is used as intended. In essence, this step of the IM approach begins earlier in the development process, informed primarily by intervention working groups (Kok, Schaalma, Ruiters, & Van Empelen, 2004). Key considerations at this step include participant recruitment and the identification of practical resources required for implementation (e.g., time, location). Two pre-testing series, and a pilot-testing series were conducted with members of the CANSOFCOM community prior to full program implementation.

Step 6: Evaluation

The final step of the IM approach involved designing an evaluation plan, identifying both process and effect evaluation questions, as well as methods for assessing these questions. The trial protocol will be registered prospectively. Full details of the evaluation framework are

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beyond the scope of the present paper and will be made available in another publication upon completion of the full trial.

Results

Step One: Needs Assessment

The first step of this IM approach, the needs assessment, involved the creation of a joint working/advisory group and a rapid review of relevant literature. A series of focus groups conducted with the joint working/advisory group identified the overarching program goal to be a customized, performance-focused mental skills training package which would be delivered in a group setting to all members of CANSOFCOM. The results of the needs assessment informed several decisions in the development and implementation of the intervention. Key findings of the needs assessment are summarized below.

Intervention working group. The working group consultation established the overall program goal as a MST program, customized and tailored to the unique needs of the CANSOFCOM community. This program would aim to increase knowledge and usage of cognitive and behavioral skills associated with optimal performance in high-pressure environments, thus equipping CANSOFCOM members with strategies and techniques to maximize and sustain optimal performance throughout the career and to manage the significant demands imparted on them by conditions of service. This program would be delivered in a group-based training setting, with skills being taught as they pertain to all facets of performance (e.g., on the job, in training, garrison and operational contexts; outside the employment context in members' personal lives).

It was identified in consultation with the intervention working group that an in-person training, delivered in moderately-sized groups of peers, would maximize participation and

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facilitate peer-to-peer interaction. The training would emphasize cognitive and behavioral skills drawn from applied sport psychology as a primary focus, and would incorporate educational content and practical skill application. The use of strengths-based approaches (e.g., Gordon & Gucciardi, 2011), which set the expectation of success on the part of the participant and explicitly reject a medical or deficit model, have been previously endorsed in military mental health training (e.g., Castro & Adler, 2011). It was further identified that a performance-focused approach, tied directly to operational readiness, would facilitate acceptance by this population of high-performing military personnel.

Literature review. The rapid review of the literature search revealed some variability in terminology among existing, related programs. This finding is unsurprising, as the term “mental skills training” is often used interchangeably in the performance psychology literature with “cognitive skills training” (Adler et al., 2015), “psychological performance training” (Page, Asken, Zwemer & Guido, 2016) and “mental fortitude training” (Fletcher & Sarkar, 2016). The more curious finding was the use of variable terms to describe initiatives with seemingly identical intent amongst military and police populations. For instance, “resilience training” programs (e.g., Anderson et al., 2015; Castro, Hoge & Cox, 2006; Cornum et al., 2011) and “mental skills training” (e.g., Adler et al., 2015; Fitzwater et al., 2018; Larsson, 1987) or “psychological skills training” (Taylor et al., 2011) interventions commonly included the instruction or promotion of similar cognitive and behavioral skills, including relaxation training (Anderson et al., 2015; Fitzwater et al., 2018), energy/activation management (Reivich et al., 2011, Fitzwater et al., 2018), and imagery training (Anderson et al., Reivich et al., 2011; Anderson et al., 2015). Interestingly, some programs aiming to achieve similar effects (e.g., promote mental toughness) did so via the application of different sets of cognitive skills (e.g.

Castro et al., 2006; Fitzwater et al., 2018). However, the rapid review showed little evidence of the specific behavioral change theories that informed these interventions.

A second key finding of the rapid review was an absence of Canadian-specific research on this population pertaining to mental performance, as well as with regard to the general resilience construct, with no population-specific research available in either the public domain or internal to the organization. As a result, the most relevant and appropriate inferences that could be drawn were derived from research and programming conducted with conventional Canadian (i.e., CAF) and allied (e.g., American) military populations. These recent efforts in both research (Adler et al., 2015; Fitzwater et al., 2018) and programming (e.g., Cornum et al., 2011; Reivich, et al., 2011) lend important insight to researchers and practitioners across allied nations. However, the extent to which these findings generalize to other military or SOF populations is unknown, as each military institution is unique in history, culture, operational mandate, and training environment, which should be reflected in nation-specific and potentially branch- or unit-specific programming. Given the uniqueness of the target population, caution was taken to not assume the findings of this literature generalize without exploring the relevance or appropriateness in detail with the working group.

Principles for best practice in developing and delivering mental health programs (Castro & Adler, 2011) were also reviewed to ensure that the training, and in particular any mental health education included within the program, was done so in accordance with best practice guidelines. Key recommendations included 1) adopting a strengths-based approach (i.e., building on skills and strengths that soldiers already possess), ensuring content is 2) experience-based (i.e., reinforcing skills and information presented via scenarios, situational training, or real world examples), 3) team-based (i.e., capitalizes on the natural comraderie inherent to military

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structures), 4) action-focused (i.e., identifies specific actions to guide soldiers' behavior, as opposed to a strictly theoretical description), 5) relevant (i.e., training should have a clear objective and be based on defined needs), 6) explanatory (i.e., highlighting potential misunderstanding that can be expected and normalizing the experiences of soldiers) and 7) evidence-based (i.e., based on previous research via randomized control trials).

Step Two: Identification of Outcomes, Performance Objectives and Change Objectives

Step two includes the identification of behavioural outcomes to be achieved by the intervention along with specific performance objectives (i.e., what a participant needs to do or change to achieve the behavioral outcome). Behavioural outcomes for the program were stated for each training area (i.e., correct and consistent application of each cognitive or behavior performance strategy). Examples of behavioral outcomes are the effective use of goal-setting principles, self-monitoring of thoughts, emotions and behaviors, and the ability to regulate stress/activation levels to optimize performance in relevant contexts (i.e., in operations/training, in garrison, and in members' personal lives).

It was identified in working group consultation that the training must emphasize the value of proper recovery and reinforce the role of physical and psychological regeneration in sustaining peak performance, given the continued high operational tempo which CANSOFCOM personnel are required to sustain. Although performance-centered in nature, the training program would include underpinnings of mental health education, given the requirement for continuous and ongoing efforts to encourage early care seeking by soldiers experiencing difficulty, and to reduce mental health stigma as it pertains to others' and one's own mental health. Existing mental health educational content from the CAF (i.e. R2MR) was leveraged and appropriately adapted to reflect the unique CANSOFCOM culture. Thus, the additional behavior outcome of

the program included increasing mental health literacy, and decreasing stigma associated with care seeking.

A number of essential resource requirements were identified during this stage. First, it was deemed important to embed qualified professionals with graduate level training in applied sport psychology (i.e. Mental Performance Specialists) who would be dedicated full-time to this initiative and working within the environment. Embedding the program development specialists would ensure that the program was delivered by credible individuals and would also provide these professionals with an opportunity to integrate into the CANSOFCOM culture. Secondly, solidifying support from the Chain of Command (i.e., CANSOFCOM leadership) was necessary to ensure that leaders across all ranks of the military hierarchy would be involved in and, ideally, supportive of the initiative, in addition to being consulted throughout the development/delivery process.

Step Three: Program Design

In step three, specific methods of instruction and program features were selected along with practical training applications, and identified individual-level change objectives. This stage also involved translating relevant theory into specific methods of instruction and practical teaching strategies. A co-facilitation delivery model was selected whereby the intervention would be delivered by the embedded mental performance specialists (i.e., professionals with graduate degrees in sport psychology) alongside trained co-facilitators (i.e., experienced members of CANSOFCOM who had completed a comprehensive Train-the-Trainer program). In addition to the co-facilitation model, critical components identified at this stage included adopting a performance-focused approach while including mental health underpinnings, integrating personnel video within the training package to normalize the experiences unique to

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service within these units, using diverse learning modalities, customizing the intervention to each of the units that would receive it, and integrating the intervention into existing military training.

Co-facilitation model. Various delivery approaches have been employed in interventions of this nature, with some training conducted by clinical professionals in psychology and social work (e.g., Taylor et al., 2011) and others by performance enhancement specialists (Fitzwater et al., 2018), uniformed members (Larsson, 1987; Reivich et al., 2011), and in some cases combinations of the above listed groups (Adler et al., 2009, Anderson et al., 2015) with little published evidence highlighting the effectiveness of each delivery method. A co-facilitation model was selected whereby the training would be co-delivered by serving members of the CANSOFCOM units and the embedded civilian specialists responsible for program development and delivery. These specialists offered subject matter expertise in mental performance, specifically applied sport psychology. However, as civilians, they had no operational military experience and it was believed that a credibility gap would exist if these specialists were delivering the training alone. Co-facilitation of the intervention with CANSOFCOM members would add credibility to the training, given the members' operational experience and existing rapport with the target audience.

Peer-to-peer engagement. Peer Assisted Learning (PAL) fosters higher-order thinking and deep-level learning (Topping, Buchs, Duran, & van Keer, 2017), as well as enhanced student satisfaction (Fantuzzo, Dimeff & Fox, 1989) and personal and professional development (Escovitz, 1990). In order to ensure the program content was relatable to the target population, peer involvement was viewed as essential. Therefore, in addition to the co-facilitation model, peer-to-peer interaction was achieved through the incorporation of personnel video testimonials, and by integrated regular discussion and group-based activities into the training.

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Diverse learning modalities. Consistent with best practice in adult education (Knowles, Holton, & Swanson, 2005), diverse training modalities were incorporated into the intervention, including individual self-reflective exercises, applied skill practice sessions, video vignettes, video teaching aids, small group breakout sessions, and large group discussions. This diversity in teaching methodology aimed to maximize participant engagement and interaction with the training content and other participants.

Unit tailored. The working group determined that the intervention must be customized to the unique military culture and reflective of differences between individual CANSOFCOM units. Customizing the training to the military culture was essential to ensure context relevance and program acceptance. The training was customized for specific units within CANSOFCOM, each of which differ in culture, mandate, and operational mission set in order to reflect the distinct responsibilities imparted on personnel in these various units.

Performance focus underpinned by mental health education. Representatives of the working group expressed that, as a peak performing organization comprised of members who are highly motivated to attain and sustain optimal performance, a prominent performance-focused approach would optimize acceptance and uptake by members. Thus, training content was predominantly performance-focused, developed from literature in sport psychology and on the allied experiences of Mental Performance specialists.

Leverage salient strengths of existing programs. The Canadian military has implemented a flagship mental health education program called the Road to Mental Readiness (R2MR). This suite of training, which has been institutionalized across the CAF training and deployment cycle (Zamorski, Rusu, Guest & Fikretoglu, 2018), has improved service members' mental health literacy, confidence in managing stress (Zamorski, Guest, Bailey, & Garber, 2012),

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and ability to recognize the need for mental health support (Fikretoglu et al., 2016). Although not designed specifically for the SOF community, the R2MR suite of training includes relevant content which could be easily adapted for inclusion in this package, specifically training content pertaining to mental health education. Thus, the primary developers of this program (KG & SB) were key stakeholders in the planning, design, and development of the current intervention. Specific content pertaining to stress, recovery, and mental health was adopted from the R2MR program, where appropriate, to ensure mental health training was consistent with that delivered across the conventional CAF while ensuring relevance to the target population. In some cases, this content was adapted to reflect unique differences (e.g., SOF-specific operational stressors, or unit-specific organizational challenges).

Moderate-sized, homogeneous training groups. Ideal group size was determined to be between twenty and forty personnel per training serial. This size was determined based on unpublished analysis of psycho-education training from the CAF suggesting that participant satisfaction may be greater with group sizes smaller than forty personnel. Senior leadership directed that the training groups should be homogeneous (i.e., including personnel from similar roles within the organization and/or unit) in order to maximize comfort and familiarity amongst participants and to create an environment conducive to disclosure and discussion. It was determined via informal consult with the community and engagement with the working group that an optimal training approach would emphasize practical skill application over scientific theory, in order to maximize interest and engagement by participants. Additionally, although all subject content was evidence-based and drew from the current literature in applied sport psychology, the in-person training materials contained minimal reference to cited sources. All references used in the development of training content were synthesized into a summary

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document and made available for participants upon request. The rationale with this approach was to generate a suite of visually appealing training materials emphasizing practical skill usage over scientific theory. Emphasis was placed on ensuring the content was presented in a clear, relatable fashion and that all participants engaged in tangible skill practice throughout the intervention.

Integrate training in existing training structure and courseware. Finally, it was determined that the current military training establishment and activities within should be leveraged in the delivery and application of the intervention, with the program integrated, where appropriate, within current training structure and courseware. Thus, the CANSOFCOM units were consulted to identify appropriate methods of insert the training into existing military courses, where applicable.

Step 4: Program Production

The fourth stage involved two pre-testing serials, a five-serial pilot series, and a Train-the-Trainer program. These activities allowed for all training serials to be trialed and refined prior to full implementation. This stage involved determining the scope of the intervention and identifying appropriate methods of delivery for the target population. This process included the development of a pre-testing and pilot series, and a structured train-the-trainer program.

Pre-testing. Two pre-testing training serials were completed in advance of the pilot series. The first pre-test was conducted with the joint working/advisory group with nine members participating in person and one via video teleconference. This pre-test serial served as the initial trial of complete training content. The inaugural train-the-trainer program, discussed below, served as the second pre-testing serial, with fourteen members representing five units participating in this pre-testing serial. During this training, participants were divided into breakout groups according to their unit and/or occupation. In these breakout groups, members

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were tasked with producing consolidated responses to group-based exercises which became the practical, unit-specific examples used in each respective unit package. This pre-test also allowed members of the development team to tailor core content further, refine practical examples, and confirm relevance and relatability for constituents prior to the pilot series.

Throughout both pre-testing serials, participants provided detailed anonymous feedback on program content, exercises, and training materials upon completion of each training module. This participant feedback identified three areas of revisions required to enhance relevance for the target constituents. First, at the recommendation of unit representatives on the joint working/advisory group during the first pre-test, select content areas (e.g., tactical breathing) were identified which were effectively covered elsewhere in alternate military training. Other areas were identified which required further explanation of the practical application of theoretical concepts (e.g., stress appraisal). Thus, select scientific content was condensed to save training time or elaborated upon for clarity. Finally, in select cases, terminology and programming scripts were adjusted to ensure consistent terms were used across the spectrum of care; that is, similar terms were being employed from the performance enhancement perspective as would be used in the context of mental health education and treatment.

Customized, unit-tailored training. This program was mandated for delivery across all units in CANSOFCOM. In order to reflect the unique culture of these units and roles performed by personnel within them, the intervention program was customized into five distinct training packages to reflect the roles performed by personnel in the units. To maximize customization for each unit, informal consultation with all units was conducted to ensure training was relevant and relatable. The core training content and individual-level change objectives were identical across the five customized packages. The unique culture of individual units was reflected in practical

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examples which were made context-specific (i.e., directly relating to that unit's training or operational context). All images and personnel video embedded within the training content were specific to the unit receiving the training.

Train-the-Trainer (TtT) program. A comprehensive, five-day co-facilitator training program was developed as a formalized means to qualify CANSOFCOM members to co-facilitate the program. Co-facilitators were recruited based on the following inclusion criteria: their involvement was volitional and based on personal interest in the training content, they had relevant operational experience, and their involvement was supported by unit leadership. As these participants would be responsible for delivering the intervention to their peers, the TtT training content involved a more detailed review of all program materials, and included structured training in principles of adult education (Galbreath, 2003; Knowles, Holton, & Swanson, 2005) as well as practical individual teaching exercises and additional group-based discussion on how to deliver training to groups of adults effectively. The TtT program culminated in a pass/fail evaluation in which all co-facilitator candidates were required to present a portion of the training content to the broader group of their peers. Each candidate was assessed by one of the program development specialists on the following components: content coverage, content fidelity, subject knowledge, organization, preparation, audience engagement, group exercise facilitation, use of clear language, use of open-ended questions, fluency of speech, as well as competencies related to the use of posture, voice and body language. Active military members from all CANSOFCOM units were recruited to complete the TtT program, thereby ensuring that, at the implementation stage, all personnel would be receiving the program, in part, by a familiar, trusted figure with relatable workplace experiences.

Pilot-testing. A pilot series was conducted to identify any further required adaptations to unit-specific packages prior to full implementation. This series also aimed to identify any further logistical constraints which were unaccounted for in the program development stage. The pilot series included a full trial of each of the five tailored packages, and was conducted over a period of seven months, based on the availability of sufficient numbers of personnel in the various units. Each pilot serial involved 14 hours of training material, delivered over two consecutive training days, and was co-facilitated with members of that unit who had completed the co-facilitator training. Each serial was conducted with between 21 and 37 members, with a total of 137 personnel participating over the seven month pilot phase. All participants anonymously completed post-training feedback forms comprised of quantitative rating scales and open-ended questions pertaining to relevance of training, value of training content, and effectiveness of co-facilitated program delivery. The quantitative feedback indicated that the majority of participants found the training to be useful and relevant to their performance in the SOF/military context. For example, in response to the item, “*The content was relevant to my performance in training and operations*”, 127 participants (92.7%) indicated they *Agree* or *Strongly Agree*, compared to 1 participant (0.7%) who reported *Disagree* or *Strongly Disagree*. In response to the item, “*I learned new techniques/strategies that I can use in the moment to manage stress and perform on demand*”, 111 participants (81%) indicated *Agree* or *Strongly Agree*, whereas 5 participants (3.6%) reported *Disagree* or *Strongly Disagree*.

Descriptive statistics for the quantitative data are summarized in Table 2. Qualitative responses were tabulated and any recurring themes (i.e., expressed by multiple participants) were reviewed by members of the content development team (PM & JC). Relevant adjustments were made to select content areas based on these recurring themes. In some instances, further

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explanation was required on key concepts (e.g., stress appraisal) and other areas required less scientific explanation (e.g., physiology of stress response). The feedback obtained through the five pilot series confirmed the co-facilitator model as an effective method of intervention delivery and that content was practically relevant and appropriate in complexity for the target constituents. The pilot series also verified that two training days was appropriate for delivery of training content.

Step 5: Planning for Adoption, Implementation and Sustainability

The fifth stage involved planning for program implementation and, in this study, included strategic communication and the development of a training schedule which would accommodate existing operational requirements as well as the program evaluation framework.

Program implementation objectives. Program adoption objectives included formalizing a communication strategy to the participating units, which ensured the units were kept informed of the forthcoming program and were prepared to facilitate implementation. Updates were issued to the units on a periodic basis in order to advise on the program intention and implementation timelines. Additionally, senior leaders were informed of the initiative from their top Commander in order to communicate the organizational value of the initiative and to demonstrate that it was supported at the highest level of leadership in the organization.

Performance objectives for program use. An implementation plan for program delivery was developed to coordinate training all personnel in the organization with consideration for limited personnel resources. A training schedule was developed and managed by the development team, in consultation with CANSOFCOM units to ensure the implementation plan would appropriately accommodate existing operational and training requirements.

Step 6: Evaluation

The development of an evaluation plan represents the final step of the IM process, the details of which will be presented in a future publication. The ideal scenario for assessing the efficacy of the training intervention is a randomized control trial (RCT). However, an RCT was deemed impractical for the purposes of the intervention, given participation was mandated for all CANSOFCOM personnel. Thus, a quasi-randomized approach was selected as the best approach given these circumstances. Full details of the evaluation framework have been registered prospectively (url masked for blind review).

Discussion

In this paper, we described the application of the IM protocol in the development of an evidence-based and theory-informed MST program for a population of elite soldiers in CANSOFCOM. This output represents the first application of the IM approach in developing a mental skills program, as well as an intervention designed for a military population. In so doing, we provide an important contribution to these literatures where information regarding intervention development and execution is often lacking detail that is essential to science (e.g., replication) and practice (e.g., implementation in the field by practitioners). Our experience with this approach and occupational context suggests that IM may be a viable model for intervention development in disciplines beyond traditional health promotion and disease prevention programming.

We gleaned two important findings from the rapid review of the literature. First, there exists a wide variety of terms to describe apparently similar objectives, including cognitive skills training (Adler et al., 2015), psychological performance training (Page et al., 2016), mental fortitude training (Fletcher & Sarkar, 2016), and hardiness training (Khoshaba & Maddi, 2001).

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This diversity in terminology underscores the importance of working towards a commonly accepted term among scholars from various disciplines to facilitate cumulative knowledge regarding mental skills training for human performance. Of particular relevance here is the need to distinguish the ‘doing’ (i.e., psychological techniques such as imagery and self-talk) and ‘having’ (i.e., psychological qualities such as commitment and confidence) components of *mental skills*. Equating the ‘having’ side of mental skills (e.g., hardiness, confidence) with the ‘doing’ components is conceptually incongruent. Second, descriptions of MST interventions in past work provide little detail on program development (e.g., rationales for content and structure), the behavior change techniques or active ingredients, theoretical underpinnings, and proposed mechanisms of effect (e.g., Adler et al., 2015; Fitzwater et al., 2018). This conceptual and methodological detail is essential for advancing science (e.g., replication studies, maximizing the chances of an effective intervention) and practice (e.g., lessons learned for application or adaptation, maximizing sustainability).

Previous research has suggested that when developing prevention training for military organizations, one method of maximizing the efficacy of universally applied prevention training is by integrating the training within the institution’s existing shared social structure (Bliese, Adler & Castro, 2011). This intervention involved a concurrent top-down (i.e., leadership directed) and bottom-up (i.e., soldier-informed) approach to consultation and program development. Including senior leadership within the planning process ensured that their interests and recommendations were reflected and that the implementation of a novel initiative was both suitable and accepted within the broader organizational priorities pertaining to resilience and performance training. Including leaders in all phases also ensured that participation in the intervention was supported across the Chain of Command. The bottom-up element, on the other

hand, allowed the development team to leverage the invaluable contribution of CANSOFCOM members throughout all phases of program design. This ongoing consultation provided contextual awareness to the stakeholders creating the program, and ensured the intervention was relevant and relatable to the members who would receive it, ultimately resulting in a customized training package for soldiers that was heavily influenced by members of their own community.

The current intervention was developed both through the creation of bespoke training material based on literature and best practice in applied sport psychology as well as the adaptation of existing content from an existing Canadian military-specific program (i.e., R2MR). In this way, the program content was customized to the population of interest, yet enabled program developers to leverage lessons learned through other established programming designed for military populations. Unsurprisingly, the content and structure of our intervention shares similarities with existing MST programs with both sport and military populations yet differs in important ways. For example, goal setting, arousal regulation, imagery, and self-talk are self-regulatory strategies common to our program and those of past work in military (e.g., Adler et al., 2015; Fitzwater et al., 2018, Taylor et al., 2011) and sport (see Brown & Fletcher, 2017). In contrast, a unique innovation of our program is the use of behavior change techniques and processes that leveraged the intervention function of persuasion (e.g., co-facilitation delivery model, videotaped training materials by participants' peers describing their use of performance enhancing skills). The option of adapting content from existing, evidence-based interventions should be considered, where relevant, and, if selected, should be done so using a systematic evidence-based and theory-informed approach (Highfield, Hartman, Dolan Mullen & Leerlooijer, 2016), and including the original program developers in the process where feasible.

As with any scientific method, there are both strengths and limitations to the IM approach. From a theoretical perspective, notable strengths of the IM protocol are the explicit consideration of theories of behavior change, and the involvement of key stakeholders in the planning process. The IM approach provides a structured framework by which program developers can apply existing literature, relevant theory, and data collected from the population of interest in the program planning. The needs assessment is balanced with an assessment of a community or organization's assets, capacities, and abilities (McKnight & Kretzman, 2012), which aims to identify organizational or individual characteristics that may be leveraged or integrated into program planning. This asset assessment, which builds upon individual, environmental, and community strengths (McKnight & Kretzmann, 2012), may enhance implementation and sustainability of the developed program (Hebert, Brandt, Armstead, Adams, & Steck, 2009) and includes such factors as the social environment (e.g., group cohesion and social identity, existing groups or organizations which could facilitate the intervention), and the information environment (e.g., existing communication channels which could be activated) (Bartholomew Eldridge et al., 2016). Another strength of the application of the IM approach is the ongoing consultation with serving military members, both formally and informally throughout the iterative development phase. Partnering with the community with emphasis on the competencies and resources of a community from the outset of program planning can mitigate a top-down or outsider approach (Minkler et al., 2008), and ensure that the program addresses issues that are locally relevant to the population of interest (Teufel-Shone, Siyuja, Watahomigie, & Irwin, 2006). Additionally, the systematic IM process facilitated the identification of barriers and enablers to implementing a MST intervention within this population. For example, one identified difference among this population in comparison to high

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performance sport is practitioner access to personnel on a recurring basis. In elite sport, training schedules are typically based on annual or multiyear training cycles, within which MST can be regularly and strategically applied in support of both training and competition. In contrast, Special Forces are characterized by dynamic, less predictable training and operations, which limits access to personnel by civilian practitioners for such initiatives. Sport psychology practitioners tasked with developing MST for other non-sport populations (e.g., medicine, aviation, aerospace, first response) and the organizations employing them may benefit from similar community consultation. Although not a facet of the IM approach itself, the development of this intervention was facilitated by having dedicated professionals assigned to this initiative, key interventionists working full-time within the CANSOFCOM organization.

Despite its strengths, several limitations must also be noted, both of the IM process and its application for the purposes of the present study. As has been stated elsewhere (Hurley et al., 2016; McEachan et al., 2008), the IM approach is time-consuming. For example, the total intervention mapping process for the present intervention took approximately two years. There are also limitations specific to the application of the IM approach in the current intervention. First, we were unable to execute fidelity checks during the pilot series or throughout program implementation due to logistical issues. This limitation was believed to be offset by having at least one mental training specialist from the program development team present for the delivery of every training serial. When feasible, it is important that program developers and implementers conduct process evaluations of complex interventions to build a cumulative knowledge base of intervention delivery features and mechanisms of impact (Moore et al., 2015). Secondly, the evaluation framework developed for this intervention was incomplete at the time of the pilot serials. Thus, there was no assessment of program effectiveness for the pilot series. Nevertheless,

it is important to acknowledge the intent of the pilot series was to understand the process of implementation rather than evaluate potential effectiveness.

Many nations within the allied forces are currently presented with similar challenges and opportunities with regard to optimizing mental performance and effectively preparing soldiers for the diverse demands imparted on them across the lifecycle of employment in high readiness units, as evidenced by the recent interest in research and programming pertaining to mental skills training in military populations (e.g., Adler et al., 2015; Fitzwater et al., 2018; Taylor et al., 2011). However, some published works offer little detail on the development processes for military-specific mental training interventions. We offer that the practices employed in developing evidence-based training should be well documented and, where appropriate, made available to like-minded institutions and agencies, in order to mitigate duplication of effort by organizations seeking solutions to similar challenges in the same timeframe. Although based specifically on the Canadian military context, there is potential that some of the lessons learned in applying the IM approach in this paper may be relevant to practitioners and researchers in the international military community.

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Table 1. Matrix of links between COM-B model (Michie, van Stralen & West, 2011), Theoretical Domains Framework (Cane, O'Connor & Michie, 2012), Behaviour Change Techniques selected from the Behavior Change Technique Taxonomy (BCTTv1; Michie et al., 2013) and practical intervention strategies.

COM-B barriers and enablers for encouraging mental skills application		TDF domains linking to COM-B components	Intervention Function	Behavior Change Techniques (BCT v1)	Practical intervention strategies
CAPABILITY	<i>Psychological Capability:</i> Limited knowledge of and exposure to mental skills training (barrier)	<i>Knowledge</i> Develop knowledge of mental skills training including potential performance enhancement benefits	Education, Training	<i>Education:</i> information about health consequences <i>Training:</i> instruction on how to perform a behaviour, behavioral practice/rehearsal, mental rehearsal of successful performance <i>Modelling:</i> demonstration of the behaviour	<i>Education:</i> Educate participants on the <i>what</i> and <i>how</i> of effective mental skills training and the relevance to performance and longevity in CANSOFCOM <i>Enablement:</i> Encourage participants to a) develop personalized plans to prompt usage of cognitive and behavioral skills, b) record behaviours in a journal or mobile application to facilitate behavioural monitoring/goal outcome monitoring, and c) identify specific situations that lead to under-performance/sub-optimal self-regulation, and identify skills/strategies to elicit preferred cognitive/behavioural responses
	Limited direct training with cognitive and behavioral skills typical of a performance-enhancement intervention (barrier)	<i>Cognitive & Interpersonal Skills</i> Understand how and when to employ mental skills related to performance optimization	Education, Training, Modelling,	<i>Enablement:</i> action planning, goal setting (behavior), self-monitoring of behaviour, self-monitoring of outcome(s) of behaviour	
	Limited direct training in behavioural regulation strategies (e.g. emotion regulation, self-monitoring) (barrier)	<i>Behavioural Regulation</i> Develop skills of self-monitoring, action planning, and goal-setting	Education, Modelling, Enablement		<i>Modelling & Training:</i> Provide practical demonstrations of cognitive, behavioural, and physical skills via in-person script or audio recording (e.g. mindfulness, mental imagery, progressive muscle relaxation), and prompt participants to practice relaxation skills at various points throughout the
	<i>Physical Capability:</i> Limited direct training with physical skills	<i>Physical Skills</i> Understand how and when to	Education, Training, Modelling,		

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	typical of a performance-enhancement intervention (barrier)	employ physical skills related to performance optimization			training
OPPORTUNITY	<i>Social Opportunity:</i> Introduce training in context of existing military social structure (enabler)	<i>Social Influences</i> Learn about, discuss, and practice mental skills training amongst peers	Persuasion Enablement	<i>Enablement:</i> social support (unspecified) <i>Modelling:</i> demonstration of the behaviour <i>Persuasion:</i> credible source, information about others' approval	<i>Enablement, Modelling & Persuasion:</i> Co-facilitation delivery model, videotaped training materials by participants' peers describing their use of performance enhancing skills, encourage participants to discuss skill application with trusted peers with similar experiences, and integrate group-based exercises and discussion into the intervention
	<i>Physical Opportunity:</i> Mandate training for target population within existing military schedule (enabler)	<i>Environmental Context & Resources</i> Provide opportunity to practice skill application amidst peers and with supervision by mental performance specialists	Modelling		
MOTIVATION	<i>Automatic Motivation:</i> Development of routines or habits of applying mental skills in various contexts (enabler)	<i>Reinforcement</i> Reinforce usage of mental skills/strategies	Enablement	<i>Education:</i> information about health consequences, self-monitoring of behavior <i>Training:</i> habit formation <i>Enablement:</i> focus on past successes	<i>Education:</i> advise participants that mental skills training is common in enhancing sport performance, and that even experienced or accomplished sport and military personnel can benefit from mental skills training, and provide educational material on neuroplasticity and habit formation
	<i>Reflective Motivation:</i> Potential low beliefs about positive outcomes of mental skills training	<i>Beliefs about capabilities</i> Believing that mental training	Education, Training	<i>Persuasion:</i> credible source, verbal persuasion about capability	<i>Training:</i> prompt participants to identify barriers preventing them from goal attainment, encourage

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	(i.e., low buy-in) (barrier), and beliefs about long-term negative effects of job stress without mitigating strategies high (enabler)	involves skill development and can lead to performance benefit			participants to reflect on previous mastery experiences and to develop a ‘highlight reel’ of past successes, and encourage pairing of mental skills with other daily activities
		<i>Goals</i> Develop and implement personal goals for mental skills application	Education, Persuasion,		<i>Persuasion:</i> show video of experienced members of participants’ peer group emphasizing the importance of mental skills training, and normalize common challenges experienced when learning mental skills training
		<i>Beliefs about consequences</i> Believing in the positive performance value of mental skills training	Education		

Table 2. Summary of quantitative pilot data.

Item	Range		<i>M</i>	<i>SD</i>
	Low	High		
The content was relevant to my performance in training and operations	1	5	4.38	0.67
The content was relevant to my performance in garrison	2	5	4.27	0.72
The content was relevant to my performance at home/in my personal life	2	5	4.38	0.70
I understand how stress can impact my performance and/or well-being in various contexts	2	5	4.64	0.57
I learned new techniques/strategies that I can use to train myself to better manage stress and perform on demand	1	5	4.12	0.82
I learned new techniques/strategies that I can use in the moment to manage stress and perform on demand	1	5	4.01	0.82
I understand how I can apply mental skills in various contexts (i.e. in operations, training, garrison or at home) to enhance my performance	1	5	4.24	0.64
I enjoyed learning about mental skills training and how it can enhance my performance in CANSOFCOM	2	5	4.26	0.77
I would recommend Special Operations Mental Agility (SOMA) to others	3	5	4.57	0.61