



**Atlantic International University
SCHOOL OF SOCIAL AND HUMAN STUDIES**

FINAL THESIS

Human behavior and performance under stress

CWR

Crawl Walk Run Method

Stress Inoculation Training Models for military personnel

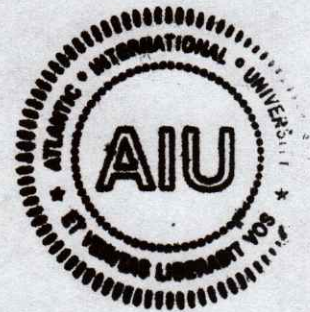


Author: Dr. Itay Gil

Student Number: UD44285HPH53129

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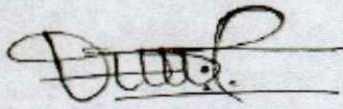
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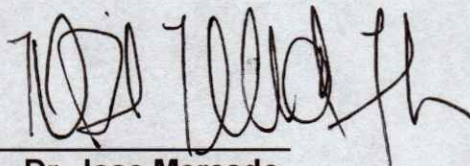
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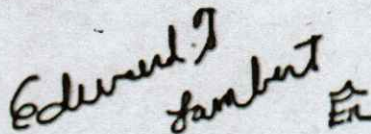
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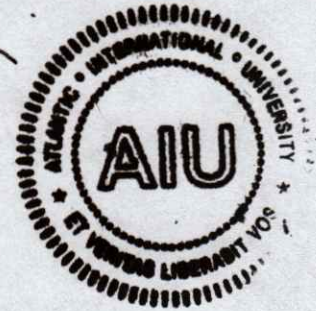
Dr. Franklin Valcin



Dr. Jose Mercado



Dr. Edward Lambert

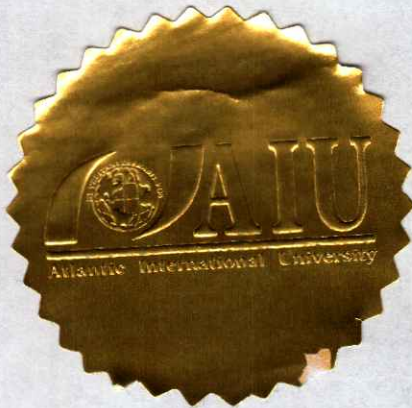


Human behavior and performance under stress

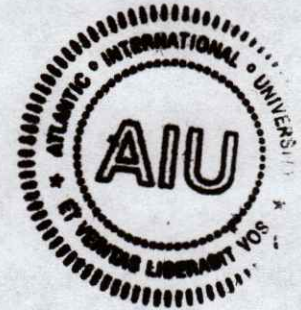
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Thanks and appreciation

To all my hero brothers from the Special Forces who fight in the shadows 24/7 no matter the weather conditions the physical pain and the mental struggles to get the job done. To all the men who have fallen in combat the warriors who struggle with PTSD. This research was achieved and accomplished because of men like you the tip of the spear Men with no fear who protect us from evil. I salute you.

Blessed be the LORD, my rock, who trains my hands for war, and my fingers for battle; Psalm 144









Abstract

The purpose of the present study was to create a scale or barometer to measure performance under stress in the individual warrior that mental resilience and the ability to recover from a negative outcome and bounce back to normal and examine the effect of the CWR model developed by the researcher. As part of the research, the performance of several special units was examined before and after the model was tested. Through different scenarios, it was possible to examine the way in which the fighters and team commanders react to the threats they had to deal with. The development of the CWR model is intended to improve the performance of the combat fighters, to expose them to a wide variety of operational attribution scenarios and indeed in a way that will reduce the chance that they will possibly struggle with post-trauma (PTSD).

The current study is a quantitative study, which examined through the implementation of an intervention program the performance of 3 special units: unit 212, Duvdevan and Yams, all special units that work against terrorism. The model included the activation of various battle scenarios based on the nature of the units and operational needs. The model is based on three levels of training: crawl, walk and run, where the level of difficulty changes between one training level and another. An intervention plan was then implemented, and the scenarios were re-enacted.

The research findings show that the implementation of the intervention program led to a significant improvement in the performance of all units and commanders. The main conclusion as emerges from the results is that in order to reduce the likelihood of combat soldiers suffering from PTSD, during or after their military and operational service, it is necessary to enhance their resilience in a way that will allow them to act and react better when dealing with extreme warfare events.

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Introduction

In my 35-year experience as a tier 1 operator & combat trainer in the IDF special forces 14 years active duty with most of the years with Yamam the elite counter terror warfare unit and the rest in the reserves with rank of major in the Israeli Defense Forces I have observed and conducted the process of individual selection, training, deployment in the one of the most challenging counter-terrorism theatres in the world. While all operators are ensured to possess physical capabilities and intelligence to meet rigorous standards, what I have seen to be most critical to mission success is a set of factors that relate to what is colloquially identified as character. To trainers like me, these are specific perceivable traits such as perseverance and resilience against adverse operational events such as coming under fire and chronic stressors such as sleep deprivation, task overload and time pressures, that make significant differences to the accomplishment of mission goals. What also has been apparent from my observations and interviews with trainees and tier one operators such as those in Sayeret Maktal, Yamam, Duvdevan, Navy SEALs and Delta Force is that a large relative percentage have come from developmental backgrounds that were marked with psychosocial and physical challenges such as poverty, parental separation, or divorce and/or being bullied. Relatedly, another trend I have observed is that many of these men in their upbringing were involved in highly physical activities requiring the same kind of operational determination and discipline as their current roles: combat sports (martial arts, wrestling); rugby; American football; regular heavy agricultural chores.

In the common parlance of popular and sport-psychology, these related phenomena are well known. Those who are raised to be hard-working, dedicated, and persistent are “gritty” and “hardy”; more likely to “work strenuously toward challenges, maintaining effort and interest over years despite failure, adversity, and plateaus in progress” (Duckworth et al., 2007). Additionally, they are resilient in that they possess personality traits such as intellect, motivation, and competence and have access to external resources such as social support, mentors or programs with whom or which they can engage to not be

negatively affected when facing adversity, stressor or traumatic events (Masten et al., 1990).

Purpose of the Study

In training military and law enforcement personnel it is critical to firstly define or operationalize these personality characteristics as from their perspective and to further develop and refine systematic methodology to mediate them in operators to maximize their physical and psychological safety and to generate positive outcomes of their engagement with foreseen and unforeseen scenarios. The stakes are high in not only preventing injury and death, but the prevalent risk of psychological trauma is daunting as the rates of combat-related Post-Traumatic Stress Disorder (PTSD) from major conflict theatres in the past 20 years are significant.

Building upon my lengthy experience and current evidence in combat training for stressful environments, the overall purpose of this study is to put forth an approach to capitalize on psycho-protective personality characteristics in terms of selection and training of those who would face unexpected adversity and dangerous situations. While there is abundant research indicating the benefits of Stress Inoculation Training to prevent psychological trauma as developed by Dr. D. H. Meichenbaum (Robson and Manacapilli, 2014), I have found that in my practice there exists a related method by which the soldier or law enforcement agent can gain greater transfer of learning for close quarters urban combat.

This study is divided into four sections. First, in a review of literature, I will present the phenomenon of combat-related PTSD and current efforts for prevention and treatment. Then the background of personnel selection with emphasis on detecting the parameters of grit, hardiness, and resilience will be discussed. From this the concept and application of Stress Inoculation Training for military personnel will be explored in addition to various relevant learning models. Thirdly, I will describe the qualitative data collected throughout my years as an instructor to exemplify the need to intensify the use of stress to select and harden future combatants. Finally, I will present my hybrid training model of Crawl, Walk,

Run (CWR) of which I have developed from my 35-year experience in Israeli counter-terrorism to address the gap in personnel selection and primary risk-reduction of combat-related PTSD.

The Importance of this Study

Despite smaller variations in prevalence depending on time post-deployment, it is recorded that for the United States combat-related PTSD incidence rates range up to 31 percent among male and female soldiers aged 18 years and older a year after deployment from Iraq and Afghanistan (Ralevski et al., 2014). Combat-related PTSD was found to comprise for nearly 30 percent of PTSD diagnoses in the United States (Barry et al. 2002). In comparison to the general population for the US, the one-year occurrence rates of PTSD are about 3 to 4.7 percent (Goldstein, R.B. et al., 2016; Narrow et al., 2002). This elevated incidence pattern is repeated when compared to the 4.5 percent rates of PTSD in deployed personnel who have not been exposed to firefights (Hoge et al., 2004).

Although active combat deployment for the US has been in retrograde, combat-related PTSD in veterans sent to intense combat zones is still expected to be at least 10 percent within the next decade if there are no further wars (Ghaffarzadegan, Ebrahimvandi & Mohammad, 2016). The rates of duty-related PTSD in police officers are also elevated in relation to that of the general population as studies have found the incidence to vary between 7 to 19 percent (McCanlies et al., 2014; Robinson, Sigman & Wilson, 1997). The medical and societal costs of this disproportionate PTSD occurrence in combatants are considerable. First year treatment for Iraq and Afghanistan veterans through the Department of Veteran Affairs (VA) exceeded \$2 billion which translated to approximately \$8300 per person in the single year of 2010. This has been calculated to be 3.5 times the health care costs for those who do not have combat-related PTSD (Congressional Budget Office, 2012). Later data show increasing burden. In 2012, the US Department of Defense (DoD) spent \$294.1 million and VA just over \$3 billion on PTSD care for service members and veterans, respectively.

Although those costs might be expected to decrease for the DoD as deployment is retrograde, there will be a corresponding increase in VA costs as service members transition to VA care (Committee on the Assessment of Ongoing Efforts in the Treatment of Posttraumatic Stress Disorder; Board on the Health of Select Populations; Institute of Medicine. 2014).

What is underscored by this data is that development and deployment of methods of combat-related psychopathology prevention that utilize individual and team resilience factors are needed to mitigate post-deployment costs. Unfortunately, with the emergence of heightened risk for terrorist attacks in the past two decades, this gap is now further extended to homeland security in developing and first world countries.

Literature Review

The Spectrum of Stress Reactions to Combat: Combat and Operational Stress Reaction, Acute Stress Disorder and Post-Traumatic Stress Disorder. From an empirical perspective, the above syndromes of psychological reactions to combat stress appear to be similar but are differentiated by severity and duration of presentation (Gindi et al., 2016).

Combat and Operational Stress Reaction

Combat and Operational Stress Reaction (COSR) is the term used by the US Army or Combat Stress Reaction (CR) as describing the large range of transient, anticipated, psychological and behavioral symptoms that are maladaptive in reaction to combat or particularly stressful military operations. It is a provisional label that endures for 72 hours from symptom onset or identification (Benedek, Hamaoka & West, 2017). CSOR is different from a psychiatric disorder in that it is not listed as a psychiatric or medically diagnosable condition and is not included in any version of the Diagnostic and Statistical Manual of Mental Disorders or the International Classification of Disease. Relatedly, while having specific signs and symptoms, it does not specify a threshold number or severity of such, as it would for psychiatric ailments. If COSR persists beyond 72 hours or escalates to signs and symptoms demonstrative of a psychiatric illness, the operator would be evaluated for a psychiatric or medical illness and be provided with appropriate treatment (Hamaoka, Benedek, & West, 2017).

The prevalence of CSOR is unknown but has been described as highly prevalent in military populations in active combat environments (US Department of the Army, 2016). The pathogenesis of CSOR has not been defined as a separate entity but is denoted as being related to the same neurobiological processes that underlie acute stress disorder and post-

traumatic stress disorder (Hamaoka, Benedek, & West, 2017). These mechanisms will be explored in detail in forthcoming sections.

Causative factors for COSR are divided into two categories: combat stress and operational stress. Combat stresses are defined as distressing events directly resulting from use of lethal force with an enemy such as attacks, personal injury, killing combatants, and witnessing death and injury. Operational stress are the distressing operational conditions associated with military operations such as prolonged exposure to extreme environments, prolonged separation from family and community, austere living conditions, demanding work hours, sleep disruption and prolonged exposure to threatening environments (Hamaoka, Benedek, & West, 2017).

Risk factors conferring vulnerability of individuals to developing COSR include history of mental disorders/substance use problems, non-military stress, prior combat exposure, length, and severity of exposure to combat, history of traumatic exposure (childhood abuse or sexual assault), inadequate training, lack of unit cohesion and/or morale and lack of faith in leadership (Hamaoka, Benedek, & West, 2017).

Clinical signs and symptoms of COSR can present in four domains: physiologic, mental, emotional, and behavioral (Hamaoka, Benedek, & West, 2017). The course of this syndrome is highly fluctuant (Brusher, 2011) but the outcome is almost all, that is 95 percent, return to active duty according to analysis of US Army data from the first decade of the 2000's (US Department of the Army, 2016). However, despite returning to active duty, many persist in experiencing symptoms and subsequent functional impairment and meet the diagnostic criteria for psychiatric disorders such as Acute Stress Disorder (ASD) and Post-Traumatic Stress Disorder (PTSD). A study of 1640 Afghanistan-deployed Army service members who were received outpatient mental health care found that 93 percent were given a psychiatric diagnosis, and that 38 percent were designated as severe (Rowan et. al., 2014). The authors further attributed this to higher rates of ASD and PTSD diagnoses compared to 9.3 percent in a sample of soldiers before deployment to Iraq (Hoge et. al., 2004).

Detailed studies regarding the trajectories of those with COSR are somewhat sparse except for those prospectively conducted in Israel examining casualties of combat-related trauma following the 1973 Yom Kippur and 1982 Lebanon Wars. Solomon and Kleinhauz (1996) found that 18 years after the Yom Kippur War, combat-stress reaction (CSR) veterans were found to have higher PTSD incidence rates than control veterans: 37% of the former group developed PTSD, compared to 23% of the control group without the condition. Solomon conducted a further 20-year longitudinal study in which the course of combat-related psychological, psychiatric, and somatic conditions was followed in a sample of CSR-affected veterans versus that of a matched control group that had participated in similar intensity of combat but had not developed any CSR symptoms. Evaluations were conducted at one, two, three and 20 years after the Lebanon War. It was found that combatants who suffered from stress reactions during engagements were significantly likely to develop PTSD at all four assessment points. Furthermore, the CSR group demonstrated significantly higher levels of symptoms across all years during the study. CSR increased the odds of PTSD development by 6.6 times than in those without stress reaction during combat. Hence, stress reactions and psychological breakdown during combat are substantial predictors of later persistent PTSD development (Solomon & Mikulincer, 2006; Solomon et al., 2006).

Management of COSR begins with recognition of signs and symptoms by peers and supervisors who are taught to first screen for the common presenting symptoms including fatigue, increased irritability, isolation, and diminished performance. To further simplify recognition, positive results are based on only on presence or absence of signs or symptoms and do not specify their number, type, severity, or duration (Hamaoka, Benedek, & West, 2017). Recognition of combat stress reaction is also framed by a four-stage continuum model that determines the level of treatment required using a decision tree.



The placement of stress reactions along a continuum emphasizes the importance of early identification of stress problems to prevent their escalation to more severe stress syndromes (Vaughan, Corbin & Goveas, 2015). Because initial screenings are often completed in austere deployment environments with limited access to mental health providers, the continuum model and decision-making process are simple heuristics that highlight symptoms that indicate the need for immediate mental health or medical attention as well as those amenable to basic intervention (Hamaoka, Benedek, & West, 2017).

The doctrine for management of COSR, named Combat and Operational Stress Control (COSC) dictates that treatment be provided to facilitate adaptive stress behaviors to minimize impact of the syndrome. As described, initial intervention (i.e. for those who are *reacting*) occurs within their units and involves frontline medical personnel. For soldiers who are categorized as *injured*, or whose signs and symptoms are persistent categorizing them as *ill*, referral to medical attention is indicated but initial intervention principles are still implemented (Hamaoka, Benedek, & West, 2017). Principles of initial treatment are

conservative and guided by the principles, which are more colloquially known by their acronym, BICEPS. The key to success and the desired outcome of the BICEPS principles are retaining and returning soldiers to their original units (Department of the Army, 2009).

Recent evaluations of COSC doctrine have highlighted some significant deficits. In examining the effectiveness of treatment of COSR, Russell and colleagues (2018) have identified only one systematic review published in 2003, which concluded that there is a paucity of controlled and correlational research on the clinical effectiveness of frontline psychiatry (Jones & Wessely, 2003). Further to this, the question of benefactor predominance was raised. Russell and Figley (2017) conducted a systematic review on COSC effectiveness and determined that "the sole empirically tested benefit of frontline psychiatry involves preventing psychiatric attrition from war zones and thus conserving the fighting force"(p.67). With respect to being beneficial to deployed personnel, they could not find any credible evidence and instead detected trends that neutralized or contradicted the health benefit claims made by the military.

Acute Stress Disorder

Acute Stress Disorder (ASD) is a psychiatric diagnostic entity describing acute stress reactions that may occur during the subsequent month after a person is exposed to a traumatic incident (Bryant, 2017). The value of the ASD diagnosis is to facilitate identification and timely treatment of severe acute stress responses which can then limit the development of the syndrome into PTSD which is diagnosed only after four weeks of symptoms following the triggering traumatic incident.

ASD prevalence has been documented as between five and 20 percent, depending on the nature and severity trauma and the instrument used to identify the disorder (Bryant, 2017). In literature pertaining to civilian contexts, prevalence by traumatic incident is listed as follows, as described by Bryant's review (2017):

- Motor vehicle accident – 21 percent.
- Mild traumatic brain injury – 14 percent.
- Assault – 19 percent.
- Burn – 10 percent.
- Industrial accident – 12 percent.
- Witnessing a mass shooting – 33 percent.

It is noteworthy that the above statistics are derived from Diagnostic and Statistical Manual of Mental Disorder – Version Four (DSM-IV). Currently there are no prevalence estimates according to the current DSM-V (U.S. Department of Veterans Affairs, 2018). Additionally, specific ASD prevalence rates for the military are lacking in the literature (Nash & Watson, 2012).

Risk factors for ASD development have been documented by research regarding survivors of motor vehicle accidents (Barton, Blanchard & Hickling, 1996; Harvey & Bryant, 1999) and mild traumatic brain injury (Bryant et al., 1998); premorbid psychiatric disorder(s), premorbid traumatic exposures prior to recent exposure, female gender, trauma severity, neuroticism, and avoidant coping. More recently, elevated acoustic startle response was found to be a risk factor by Bryant and Guthrie (2005) in their study of firefighter recruits whose trait predicted acute stress reactions after exposure to traumatic events.

Military literature regarding contributing factors to acute stress provide a fuller picture. A 2009 study by Taylor et al. (2009) determined several key points. Coping styles and acute stress symptoms were correlated in 35 healthy male Navy personnel undergoing Survival, Evasion, Resistance and Escape (SERE) training, a harsh and realistic course where service members at high risk of capture are taught to survive, evade enemy captors, and resist during stressful mock captivity scenarios. The authors used univariate and multivariate analyses to indicate that perceived stress, passive coping, and emotion-focused

coping predicted acute stress during survival training whereas active coping and problem-focused coping did not. It is of note that they commented that baseline stress levels and coping styles are modifiable.

Clinical manifestations of ASD in survivors generally present with severe levels of anxiety and re-experiencing of the traumatic event in response to sensory reminders (visual, auditory, tactile, gustatory, or olfactory cues) of the recent trauma (Bryant, 2017). These reactions to seemingly innocuous environmental features are often then re-activated by their re-engaging with their activities of daily living, occupations in their community which lead to generalized fear and vigilance for further threats. Hence, sufferers actively avoid any perceived threat and reminders of such threat to minimize distress by eluding any conversations, situations or even thoughts that will reactivate their fear. This may even generalize to being avoidant to discuss their experience of the precipitant traumatic incident during clinical assessment and treatment (Bryant, 2017). Patients who experience three or more dissociative symptoms, i.e. flashbacks, having an altered sense of one's environment or oneself, sense of time dilatation, present with a blunted or flat affect, often self-described as emotional numbing, and appear to be in shock. They may even display dissociative responses when recounting their trauma. Alternatively, they may be amnesic to the core aspects of their traumatic experiences and are unable to recall key events (Bryant, 2017).

The current pathogenic model of ASD development is intrinsically related to the results of unmitigated hyperarousal. Fikretoglu et al.(2006, 2007) in several studies found that in acutely traumatized individuals, the levels peritraumatic panic determined the relationship between peritraumatic dissociation and ASD. Furthermore, this triangular relationship was determined to be also present with chronic PTSD (Bryant et al, 2011). These findings are consistent with the prevalent model of ASD and PTSD which states that the extreme sympathetic arousal in response to the traumatic incident result in the release of stress hormones, namely adrenalin and noradrenalin, which lead to the over-consolidation or entrenchment of traumatic memories (Charney et al, 1993).

Cognitive features also have been found to be related to the linkage between ASD and PTSD. The accentuation of negative appraisals of the traumatic events, strength of symptoms and beliefs about the likelihood of future harm in ASD sufferers, have been identified as key contributions to later PTSD development in army veterans for example (Ehlers and Clark, 2000). Diagnostic criteria for ASD according to the DSM-V are listed in Appendix A.

Bryant (2017) notes, that although ASD can be diagnosed three days after the traumatic event, delaying the diagnosis until a week after the traumatic event may be more effective in identifying those who could be effectively treated and are at greater risk of developing PTSD. There is inherent risk with diagnosis within three days of capturing persons who are undergoing a transient stress reaction that will abate in the following week. Nuances in applying the Symptom criterion are also important as they must be severe to warrant a diagnosis (Bryant, 2017). For example, most people will present with some pattern of avoidance in the month after trauma, but to meet the Avoidance Symptom criterion, the sufferer must demonstrate effortful avoidance that reflects a pre-meditated and repetitive effort to avoid triggering reminders of their traumatic incident.

For civilian sufferers of ASD, their symptom course involves marked distress in the initial days and weeks after the traumatic event, but then the majority of civilian people tend to adapt and such symptoms remit (Bryant, 2017). This narrative has been documented in survivors of motor vehicle accidents (Blanchard et al., 1996), rape (Rothboam et al., 1992), assault (Riggs, Rothboam & Foa, 1995) and terrorist attacks (Hobfoll et al., 2007). The percentage of those in the civilian literature afflicted with ASD that go on to develop PTSD are unclear which confounds the question of how predictive ASD is of later PTSD occurrence (Bryant, 2017).

In contrast, Breslau et al., (2004) estimates that approximately 80 percent of those diagnosed with ASD will develop PTSD. They underscore the importance of early intervention during ASD as those with ASD who receive cognitive-behavioral therapy will

then have a 20 percent chance of PTSD development. Regarding the military population, there is a paucity of existing research on the natural history and epidemiology of acute stress as recognized by the US Department of Veterans Affairs (VA) and the Department of Defense (DOD) (Nash & Watson, 2012). Perhaps this may be due in large part to the emphasis of the return-to-duty goal of early management of acute stress in the military (Russell & Figley, 2016).

Current clinical practice guidelines for the management of acute stress disorder were forth by the VA/DOD in June 2017 and are summarized in an algorithm. Prior guidelines published in 2010 by the VA were reviewed by Nash and Watson in 2012 that provide elaboration that are still relevant. The following key points of the guidelines are described as follows.

1. *Identification of persons who have excessive and persistent symptoms*

This point is particularly germane to military settings in which stoicism is greatly regarded in contrast to that of seeking help. Hence, the stigma barrier must be overcome by vigilance toward those suspected of persisting or worsening traumatic stress symptoms (Nash & Watson, 2012). Such soldiers should be screened for ASD using DSM-V criteria.

2. *Assess medical and functional status*

Soldiers with clinically valid distress or impairment in any area of functioning two days after traumatic exposure should be assessed for medical, neurological, toxicological and cognitive co-morbidities that may confound the presumed presence of ASD (Nash & Watson, 2012).

3. *Assess pre-existing psychiatric and medical conditions*

Identification and treatment of pre-existing risk factors for PTSD needs to be completed to further mitigate risk of PTSD development. One such risk factor may

be a history of substance abuse that may complicate recovery from posttraumatic stress (Nash & Watson, 2012).

4. *Assess for further risk factors for developing ASD/PTSD*

Risk factors defined by the guidelines are divided into three categories: pre-traumatic factors such as the cumulative stress load experienced by the soldier at the time of the traumatic incident; peri-traumatic factors such as physical injury or role failure due to dissociation and/or immobility at the time of the traumatic event; and post-traumatic factors such as the availability and quality of social support (Nash & Watson, 2012).

5. *Provide education and normalization*

Soldiers experiencing ASD should be provided with education regarding the nature of traumatic injuries and effective coping strategies to facilitate normalization, improve coping, enhance self-care, recognition of significant difficulty in coping (Nash & Watson, 2012; U.S. Department of Veterans Affairs, 2017).

6. *Initiation of brief psychotherapy*

Based on evidence, the guidelines give its strongest recommendation to this intervention as a first-line treatment for those suffering from traumatic stress beyond two days. Brief, trauma-focused cognitive-behavioral therapy (CBT) over a period of four to five sessions are recommended once persisting or worsening symptoms are recognized (Nash & Watson, 2012). The therapy should include exposure-based therapy alone or combined with cognitive re-structuring therapy (U.S. Department of Veterans Affairs, 2017). It is noteworthy that the principles of exposure and cognitive re-structuring are highlighted as they are also such with the gold-standard treatment of PTSD (Rauch, Eftekhari & Ruzek, 2012; U.S. Department of Veterans Affairs, 2018). Exposure therapy usually involves both imaginal and in vivo exposure. Imaginal exposure requires the patient to vividly imagine the traumatic

experience for long periods and is cued by the therapist to narrate their experience of trauma with all relevant details. In vivo exposure treatment involves repetitive and graded exposure to the feared stimuli in a progressive fashion until the patient feels comfortable with the reminders of the traumatic experience (Bryant, 2019). Cognitive re-structuring involves the identification, evaluation and modification of negative automatic thought processes (Bryant, 2019). Bryant and colleagues (1998, 1999, 2003) conducted studies on the specific treatment of ASD with brief trauma-focused CBT and concluded that benefits yielded not only amelioration of symptoms but reduction of subsequent development of PTSD.

7. *Management of acute symptoms*

The guidelines recognize that acute symptomatology of ASD warrant specific pharmacological and non-pharmacological intervention. Among acute symptoms are sleep disturbances, pain, excessive arousal, or irritability including panic or rage attacks (Nash & Watson, 2012). Provision of short courses of medication, relaxation training, sleep-hygiene training and caffeine avoidance are recommended (U.S. Department of Veterans Affairs, 2017).

8. *Avoidance of individual or group psychological debriefing*

Psychological debriefing (PD) is a structured single-session group intervention for early intervention after trauma (Nash & Watson, 2012). PD has been widely adopted in police, fire, emergency medicine and military settings. However, unlike the approach recommended by the guidelines, it does not include a component of assessment of symptom needs and assumes that all individuals who have sustained the same traumatic stressor has similar, if not identical needs. Because of this, its mode of intervention is also of a catch-all method rather than a set of treatment tools that can be tailored for each person's immediate situation. PD also presumes that a single session of help is adequate and is without any protocol for follow-up or detecting those who need greater treatment. Randomized controlled trials of PD

have reported higher incidence of negative outcomes in recipients compared to those who did not receive any intervention (McNally, Bryant & Ehlers, 2003; Rose, Bisson & Wessely, 2003).

Post-Traumatic Stress Disorder

Post-traumatic stress disorder (PTSD) is a set of symptoms persisting for more than a month after exposure to psychological trauma (van der Kolk BA et. al., 1996). These symptoms are characterized by intrusive thoughts, avoidance reminders of trauma, hypervigilance, and sleep disturbance, all of which lead to interpersonal, social, and occupational dysfunction (Sareen et al., 2017). Diagnostic criteria are listed in Appendix B.

To reiterate, analyses of combined data sets have shown that differences in combat-related PTSD prevalence data are directly related to the level of combat exposure, with an overall average of six percent in population samples from all services and countries (including support personnel) and 13 percent in combat-exposed infantry units (Kok, B. et. al., 2012). This dose-response curve associating PTSD with severity of combat (measured as the number of direct and indirect combat events) tended to plateau at approximately 25 to 30 percent (Hoge et. al., 2004).

For special operations forces (SOF), literature regarding incidence and prevalence are sparse but overall point to lessened rates. Hanwella and de Silva (2012) found that PTSD prevalence in the Sri Lankan Special Forces compared to that of the regular Naval forces was 1.9 percent to 2.9 percent, respectively, in the one-year period of May 2008 to 2009, during which intense combat operations took place. They cited that although exposure to potentially traumatic events were high in both groups, that of the Special Forces were significantly more. Specifically, more than 80 percent of Special Forces had direct action experience: discharging weapons in direct combat, engaging in combat with enemy vessels and exposure to the dead and wounded. Interestingly this highlights a paradoxical inverse

relationship between PTSD prevalence and combat exposure which conflicts with older findings regarding regular forces (Hoge et. al., 2004). Osorio et al. (2012) conducted a self-report study assessing PTSD symptoms and other health complaints in a sample of Portuguese Army Special Forces members after their Afghanistan deployment between 2005 and 2010. They found that 2.7 percent of the participants reported symptoms consistent with PTSD, but such symptoms were significantly related to physical health complaints. Hing et al. (2012) conducted similar study using an anonymous self-report survey of SOF personnel and found approximately 16 to 20 percent of the respondents meeting score thresholds for PTSD. These figures however were later scrutinized by Neller and Butcher (2014) who with more advanced interpretation adjusted this value to one percent.

The inverted and unorthodox relationship between combat exposure and PTSD incidence in specialized combatant populations were also highlighted by Lubin, Barash and Levinson (2016) in their cross-sectional comparative study of the mental health statuses of Israelis who have participated in combat with those whose military service did not include combat-related activities. The combat group had significantly lower lifetime prevalence of PTSD (0.54% vs. 2.4%, $p=0.05$). The authors attributed this to the rigor of the selection and training processes that better prepares the soldier to meet the expected combat stress. As well, they listed the leadership and unit cohesion of the respective combat-experienced soldiers that served as buffers to the effects of potentially traumatic events. Specifically, those who fought with their original units were less likely to suffer from PTSD than those who underwent team changes.

Risk factors for PTSD development in the civilian realm are significant among the varying incident traumas. An analysis from a survey of a large community-based sample in 24 countries estimated the conditional probability of PTSD for 29 types of traumatic events (Kessler et. al., 2014):

- Sexual relationship violence – 33 percent (e.g. rape, childhood sexual abuse, intimate partner violence).

- Interpersonal- network traumatic experiences – 30 percent (e.g. unexpected death of a loved one, life- threatening illness of a child, other traumatic event of a loved one).
- Interpersonal violence – 12 percent (e.g. childhood physical abuse or witnessing interpersonal violence, physical assault, or being threatened by violence).
- Exposure to organized violence – 3 percent (e.g. refugee, kidnapped, civilian in war zone).
- Participation in organized violence – 11 percent (e.g. combat exposure, witnessing death/serious injury or discovered dead bodies, accidentally or purposefully caused death or serious injury). ^[1]_{SEP}
- Other life- threatening traumatic events – 12 percent (e.g. life- threatening motor vehicle collision, natural disaster, toxic chemical exposure).

Aside from identifying risk factors according to trauma exposure, much emphasis has been placed on the risks conferred by the cognitive and affective reactivity of the individual. This is because the theoretical models that describe the etiology and maintenance of PTSD identify such reactivity mechanisms as being predominant in the interplay between pre-existing characteristics, traumatic experiences, and PTSD symptoms (Bomyea, Risbrough and Lang, 2012). As such certain constitutional elements, or pre-trauma risk factors predispose the individual to developing psychopathology i.e. PTSD, when exposed to severe environmental stress.

For example, in models that are based on the schemas or core beliefs about the person's self, others and the world, PTSD occurs when there is an incompatibility of trauma-related information with pre-existing schemas. This leads to affective and cognitive symptoms until this new information can be incorporated into the person's prior conceptualizations (Janoff-Bulman, 1989).

Associative network models such as Emotional Processing Theory, hold that vulnerable individuals tend to form fear structures which are networks of maladaptive thinking that become activated through fear or anxiety. These networks encode the stimulus, the person's concept of their own response, and subjective meaning of the stimulus and response elements which together act as an automatic program by which the person avoids and escapes perceived danger (Foa, Huppert and Cahill, 2006). Although most fear structures accurately represent legitimate threats, others become distorted. At-risk individuals do not adequately reflect upon the event initially and thus do not successfully evoke and cope with the associated emotions, so that harmless stimuli bearing some resemblance to the original become designated as dangerous and trigger excessive physiological and emotional reactions. In turn they engage in deliberate avoidance of memories of the event, emotional withdrawal, and other maladaptive behaviors (APA "emotional processing theory", 2019).

It is of note that Emotional Processing Theory elaborates on the classical conditioning model of PTSD (Herman, 2012; Johnson, McGuire, Lazarus and Palmer, 2012; Foa and Kozak, 1986) which is considered the fundamentally accepted neurobiological model. It posits that excessive activation of the amygdala by threatening stimuli facilitates the recall of emotional events and enacts autonomic responses, fear responses and approach or avoidance behaviour. This overactivation is derived from amygdala due to dysfunction of the medial prefrontal cortex, which normally regulates the activity of the amygdala (Vermetten and Bremner, 2002). Resultingly, the individual is rendered vulnerable to recurrent and spiralling fear conditioning in which seemingly innocuous stimuli are appraised as threatening, further sensitizing key emotional brain circuitry, and lowering fearful response reactivity (Southwick et. al., 2007). Hence, the individual's re-experiencing of arousal symptoms are the conditioned emotional responses in which the initial traumatic event is the unconditioned stimulus, and the associated and ambiguous environmental reminders serve as the conditioned stimuli (Herman, 2012). It is on this neurobiological model that the gold-standard PTSD treatment, prolonged exposure therapy (Ross et. al,

2017), is underpinned. This treatment extinguishes conditioned fear reactions and lowers trauma-related anxiety through progressive and repetitive, imaginative, and real-life, exposure to triggering stimuli. Along with discussion and correction of their erroneous beliefs and feelings, this method habituates the individual to the traumatic event such that its memories and associated environmental reminders no longer evokes the distress that it previously did (Cahill and Foa, 2007; "prolonged exposure therapy", 2019).

Cognitive models, namely that proposed by Ehlers and Clark (2000) highlight the roles of the following in PTSD development and maintenance: maladaptive beliefs and appraisals about the self, others, the world, and symptoms; problems with regulation of memory to encode sensory versus conceptual information; poor autobiographical memory representations of the traumatic incident; strong perceptual priming towards stimuli related to the traumatic event; and dysfunctional behavioral strategies that prevent the change in the person's trauma appraisal and nature of the trauma memory.

In addition to the above models, the review by Bomyea, Risbrough and Lang (2012) lists several cognitive biases that are considered vulnerability factors, defined as enduring, endogenous traits inherent in the individual that serve to increase the likelihood of developing psychopathology such as PTSD. Furthermore, such vulnerability factors are suggested to be causal in nature, that is they are direct indicators of empirically studied mechanisms that lead to PTSD in contrast to general risk factors that are related to increased probability of psychopathology formation. They are summarized below.

1. **Negative attributional style and rumination** -These refer to the individual's tendency to account for events by attributing to them "internal, stable and global causes" (Elwood et al., 2009) and the tendency to mentally dwell on negative emotions and events. Together they lead the person to perceive less control over their environment and prevent his/her cognitive processing of the details of the traumatic event.

2. **Negative appraisals** - Cross-sectional (Engelhard, Macklin, McNally, van den Hout and Arntz, 2001; Smith and Bryant, 2000; Dunmore, Clark and Ehlers, 1999) indicate that PTSD is strongly associated with negative beliefs about the individual's reactions during the trauma, the meaning of continued symptoms of PTSD, and subjective sense of current threat in the environment. Longitudinal studies (Dunmore, Clark and Ehlers, 2001; Ehlers, Mayou and Bryant, 1998; Ehring, Ehlers and Glucksman, 2008, Halligan et al., 2003) measuring post-trauma appraisals also demonstrate the relationship between negative appraisals and PTSD development. More importantly, studies about first responders (firefighters and police officers) regarding appraisals regarding one's ability to cope prior to trauma indicate vulnerability to PTSD inception (Bryant and Guthrie, 2007; Yuan et. al, 2011).
3. **Fear of emotions** - Increased fear of the experience or consequences of expressing emotions has been shown to be associated with greater PTSD severity. This also includes anxiety and disgust sensitivity. It is of note that disgust sensitivity has been demonstrated to be related to PTSD derived from combat (Foy, Sippelle, Rueger & Carroll, 1984). Engelhard, Olatunji, & de Jong (2011) concluded that disgust sensitivity interacts with peri-traumatic reactions to predict PTSD in combat-exposed military personnel.
4. **Looming cognitive style** - Individuals with looming cognitive style tend to pervasively predict threat in the environment coupled with the sense that this threat is rapidly increasing (Reardon and Williams, 2007). This phenomenon has been found to be related to information processing biases in PTSD, that is individuals with PTSD demonstrate attention and memory biases toward threatening information (Riskind, Williams, Gessner, Chrosniak & Cortina, 2000). Furthermore, studies by Beevers et al. (2011) and Wald et al. (2019) in military populations demonstrated that pre-trauma attention biases in combatants predicted PTSD development. Wald et al. (2019) proposed that attention biases with respect to perceived threats may be a

cognitive manifestation of avoidance symptoms that facilitate the exacerbation and maintenance of PTSD. Indeed, Brewin (2011) concluded that an individual's challenge in attending to trauma stimuli may disrupt the processing of trauma-related stimuli during the trigger incident, leading to disorganization in autobiographical memory coherence that contribute to PTSD development.

Bomyea, Risbrough and Lang (2012), in their review, proposed a model by which the above pre-trauma factors in combination with others (e.g. genetic variables modulating neurobiological bases of activity and neuroendocrine response) confer vulnerability to PTSD development in an individual. They described two potential pathways. The first pathway is that many pre-trauma vulnerability factors (e.g. molecular genetic variables that modulate the neurobiological bases of anxiety, neuroendocrine responses and autonomic arousal; cognitive biases such as the tendency to make negative appraisals that facilitate the sense of current threat) directly increase anxious reactivity to stimuli. The second pathway operates via reduced cognitive control processes such as the proactive interference control over trauma-related cognitions which increases the frequency of intrusive memories. Both pathways lead to avoidance of stimuli resembling that of the critical incident via operant conditioning, that is situations featuring trigger stimuli are avoided to reduce anxiety and symptoms.

Despite the strongly identified pre-trauma cognitive risk factors, civilian peritraumatic responses also demonstrate a strong relationship with PTSD. In a large meta-analysis of 68 studies, Ozer, Best, Lipsey and Weiss (2003) examined the significant predictors of PTSD including prior trauma, prior psychological adjustment, family history of psychopathology, perceived life threat during the trauma, post-trauma social support, peritraumatic emotional responses and peritraumatic dissociation. It was found above all the others, peritraumatic dissociation had the largest effect size (weighted $r=.35$), indicating that peritraumatic psychological processes, not prior characteristics, are the strongest determinants of PTSD. This relationship was later replicated by another meta-analysis by

Lensvelt-Mulders et al. (2008) which demonstrated a stronger correlation between peritraumatic dissociation and PTSD symptomatology ($r=.40$).

Further reductive examination of the peritraumatic response (PTR) in relation to predicting PTSD shows that the behavioral component of PTR, tonic immobility (TI), similar to peritraumatic dissociation, plays a key role. TI is a passive behavior characterized by reversible motor inhibition that lasts from a few seconds to several hours, suppressed vocalization, fixed and focused stare (Marx et al., 2008; Bovin, Ratchford, and Marx, 2014). It is noted that different from PTD, the subjective components of TI allow for intact memory and learning despite the high emotional arousal. The primary antecedents to TI are the subjective perception of the traumatic value of the critical incident(s) and the presence of intense fear, helplessness or horror, and perceptions of inescapability (Bados, Garcia-Grau and Fusté, 2015; Bovin et al, 2008). The relationship between TI and PTSD is well documented and TI is a pre-eminent peritraumatic risk factor for subsequent PTSD symptomatology (Bovin et al. 2008; Humphreys, Saunder, Martin, and Marx, 2010; Lima et al., 2010; Rocha-Rego et al., 2009). Relatedly, TI and PTD, though different constructs, co-occur with high regularity during traumatic events (Bovin, Ratchford, and Marx, 2014) and are postulated to be stages of the defense cascade model. Adapted from models based on animal studies, Schauer and Elbert (2010) developed this six-stage sequential model describing the series of defensive reflexes through which an individual escalates as a function defensive possibilities and proximity to danger during life-threat: freeze, flight, fight, TI, flag, and faint.

With increasing proximity to the source of the perceived threat, the first half of the cascade is primarily dominated by the sympathetic nervous system which ramps up emotional arousal which peaks with TI. At this stage with the perception of inescapable threat, TI is both mediated by apical sympathetic and arising parasympathetic nervous system influences, which accounts for combination of voluntary control of learning and memory with cessation of motor control. Progressively with increasing threat TI evolves

into the flag/faint stages that are solely influenced by the parasympathetic nervous system. This is the point at which the "shutdown" PTD occurs, marked by flaccid muscle tone, low heart rate and blood pressure, a drop in arousal, cognitive failure, and the blunting of all emotions (Bovin, Ratchford, and Marx, 2014).

It is noteworthy to understand that the progression through the defense cascade has been shown to be modifiable. This is based on clear findings that the individual's perception of how traumatic the event was and the presence of intense fear, sense of inescapability are significant predictors of TI, which highlights the importance of a person's initial reaction to trauma (Bados, Garcia-Grau and Fusté, 2015). Further studies of trauma value evaluation show that it is likely the result of the interaction between incident characteristics (i.e. severity) and personal variables such as neuroticism, negative affect, perceived lack of personal control (i.e. external LOC) and resources for coping with or escaping from the situation (Connor and Butterfield, 2003/2005). Hence interventions have been developed to increase individual resources for coping with and preventing traumatic events to reduce the likelihood of a response with TI in case of critical event occurrence. Examples include programs to enhance preparedness in civilians living in areas subject to rocket attacks (Wolmer, Hamiel and Laor, 2011) and earthquakes (Tamanos and Manos, 2004). More recently programs have been deployed to train emergency workers, flight or ship crews, firefighters, security, and military personnel (Griffith and West, 2013; O'Connor et al., 2008). Later in this document, the precepts of programs of this nature will be explored.

In regards risk factors for PTSD in the military and first responder populations, which include age, sex, socioeconomic status and pre-deployment psychopathology, the reader is recommended to the comprehensive meta-analysis by Xue et. al (2015). For the purposes of this thesis, instrumental pre-trauma and peri-traumatic risk factors for combat-related PTSD development will be examined.

Pre-deployment risk factors for PTSD development appear in the literature as combinations of personality, experience, and coping styles. Bramsen et al. (2000) found that

after controlling for quantity of combat exposure, pre-deployment personality negativism strongly predicted PTSD symptoms after deployment. The importance of negative affect was later highlighted as a key factor in synergistically combining with peritraumatic dissociation (PTD) to predict PTSD symptom severity (Maia et al., 2011). PTD is described as the subjective feeling of emotional numbness, detachment from others, reduced responsiveness to one's surroundings, depersonalization, and derealization during or immediately after traumatic exposure (American Psychiatric Association, 1994). It is situationally bound and severely disrupts the integrated functions of consciousness, memory, identity, and environmental perception in response to extreme stress and/trauma (Taylor, M.K. and Morgan, C.A., 2014). In their cross-sectional study of over two hundred Brazilian police officers, Maia et al. (2011) indicated that those with higher negativity showed a prolongation of heightened arousal that would elicit and maintain early dissociation (i.e. PTD), interfering with fear encoding and proper stimuli processing and leading to higher scores of PTSD symptoms. This is consistent with the cognitive models of PTSD discussed earlier, which highlights the strong relationship between individual coping with trauma memories and PTSD, rather than the traumatic event itself (Halligan et al., 2003).

Relatedly, an important personality component that predicts PTSD is trait dissociation, which is the tendency to experience dissociative symptoms (Hagenaars and Krans, 2011). The relationship of this factor assessed during academy training, to PTSD symptoms, assessed at 12 months of active police duty, was studied in one-hundred and eighty police academy recruits by McCaslin et. al. (2008). It was discovered that greater trait dissociation was predictive of both PTD and PTSD symptoms. As well after accounting for trait dissociation and PTD, the relationship of previous trauma was no longer significant, demonstrating that the effects of previous trauma on later vulnerability to PTSD symptoms may be mediated by both trait and peri-traumatic dissociation.

Personality traits, however, can also confer resilience against dysfunctional stress reactions. Hardiness, a personality construct defined as possessing a sense of control, viewing change as a challenge, and commitment to oneself was found to be protective against PTSD development in veteran samples ranging from Vietnam to the Gulf War (King et al, 1998; Sutker, Davis, Uddo and Ditta, 1995). Relatedly, the locus of control, or the extent to which an individual perceives that they can control events that affect them, has been identified as either being an important mediator of or a significantly protective agent against the development of PTSD. Possessing the belief that events are controllable by one's actions (internal LOC) is in contrast with believing that events are beyond one's control (external LOC). In 2015, Karstoft and colleagues conducted a longitudinal study to determine the relationship between LOC and long-term PTSD outcomes after exposure to combat in 675 Israeli soldiers in the Lebanon war. They found that an internal LOC decreased the likelihood of developing acute and chronic distress. Expectedly, there is notable evidence that having soldiers with an external LOC experience higher levels of PTSD-symptoms (Casella and Motta, 1990; McKeever, McWhirter and Huff, 2006; Norris et al., 2002; Solomon, Avitzur, and Mikulincer 1990).

Exposure to combat before deployment has been identified as a major contributor to PTSD development. Ramchand et al. (2010) reviewed 29 studies of personnel from Operation Iraqi Freedom and Operation Enduring Freedom and found that combat exposure was the only factor consistently associated with PTSD. More specifically, Polusny et al. (2011) tabulated the effect sizes of various kinds of combat exposure on new-onset PTSD in over 300 National Guard troops deployed to Iraq. Experiences that had the largest contributions (Cohen's $d > 0.2$) were killed or believed to have killed enemy in combat; exposure to sight, sound, smell of animals that had been wounded or killed from war-related causes; seeing civilians after they had been severely wounded or disfigured; seeing bodies of dead enemy soldiers. Additional studies have identified further combat exposure experiences that are PTSD risk-factors: threat of personal harm (Kolkow et al., 2007;

Peterson et al., 2023; Phillips et al., 2010); witnessing someone from one's unit or ally unit being seriously wounded or killed (Pietrzak et al., 2011), and experiencing "friendly" fire (Pietrzak et al., 2011). Collectively the direction of this evidence is contradicted by findings of Lubin, Barash and Levinson (2016), which indicated that Israelis who have participated in combat have significantly lower lifetime prevalence of PTSD versus those who did not. Explanations for this by the author highlighted the rigor of selection and training that prepared the Israeli combatants as the presumptive differential factors that lead to the "healthy warrior effect" (Hanwella and de Silva, 2012; Larson et al., 2008). Of note in an equally stressful but civilian role of the firefighter, threat-induced freezing was found to be significantly lower in experienced individuals than their inexperienced counterparts (Ly, Roijendijk, Hazebroek, Tonnaer, and Hagenaaers, 2017). This finding is significant as threat-induced freezing is a component of the defense cascade which later examined in this document, relates much to PTSD development.

Coping styles before deployment present as risk in and protective factors in combat-PTSD development. Coping style is defined as the cognitive and behavioral efforts applied by the individual to manage internal or external demands (Lazarus and Folkman, 1984). One spectrum of coping style, the problem-focused strategy, aimed at solving the stress-creating antecedent, is versus the emotion-focused strategy, aimed at reducing internal distress (Lazarus and Folkman, 1984). While the problem-focused strategy focuses on direct action, the emotion-focused coping style aims to lower the experienced distress from the antecedent problem through practices such as reappraisal, selective attention, and avoidance (Lazarus and Folkman, 1984). Emotion-focused coping styles, especially avoidance coping is associated with higher levels of PTSD (Brousse et al., 2011; Bryant and Harvey, 1995; Chang et al., 2003; Ménard and Arter, 2014; Mikulincer and Solomon, 1989). Problem-focused coping styles are associated with lower levels of PTSD (Mikulincer and Solomon, 1989).

Service-related risk factors or factors that manifest during deployment or combat demonstrate the most instrumental relationships with PTSD development: PTD, exposure to war-zone stressors, perception of combat exposure/war stress, and coping styles. Most notably the strongest contributing factor is peri-traumatic dissociation (PTD) (Maguen, Suvak and Litz, 2006; Bovin and Marx, 2011). Indeed, the concept of PTD determining the trajectory of recovery versus non-recovery from critical incident stress is well supported in the law enforcement population. Galetzer-Levy et al. (2011) showed that PTD differentiated the members of their sample (175 active-duty police officers after experiencing a life-threatening event), the resilient from the distressed-worsening trajectory in terms of PTSD symptom course. For the military, PTD and its relationship and correlation with several other factors have been examined in a multitude of studies that underlines its importance in PTSD formation and symptom trajectory. Nash et. al (2014) longitudinally studied a cohort of 867 Marines from a single infantry battalion that deployed to Afghanistan at peak conflict. Data regarding PTSD symptoms were collected at 1 month prior to deployment and again at 1-, 5-, and 8-months post-deployment. Analysis showed three groupings of symptomatic trajectories in which the subjects belonged: low-stable symptom course that consists of persistently low symptoms; new-onset PTSD course demonstrating clinically significant symptoms after deployment that had not previously existed; pre-existing PTSD symptoms course marked by high-level symptoms that existed pre-deployment, gradually decreases but remains moderate through the eight-month deployment. It was determined that the key predictors of membership in the new onset trajectory were PTD and avoidant coping. As previously mentioned, negative affect has been found with PTD to predict PTSD as it prolongs the hyperarousal that initiates and propels early dissociation (Maia et al., 2011). Relatedly the concept of peritraumatic distress, or emotional hyperarousal coupled with subsequent PTSD in response to a critical incident was found by Marmar et. al (2006) to explain a significant 39.7% of the variance in PTSD symptoms in their cross-sectional study of a large sample of police officers (n=715).

Exposure to war-zone stressors as predictors of PTSD in soldiers are repletely documented. King et al. (1995), in their study of Vietnam War veterans, found that four war-zone parameters were differentially related to PTSD: perceived threat, malevolent environment, traditional combat and atrocities/abusive violence such as exposure to observing the mutilation and killing of civilians. It was discovered that perceived threat was directly and positively related to PTSD, but also served as the mediator between malevolent environment and PTSD, and between traditional combat and PTSD. Later studies point to the quality of combat exposure over quantity that differentially predicts PTSD rates. Adler, Vaitkus, and Martin (1996) reported that in Gulf War veterans, those most exposed to U.S. soldier casualties demonstrated the most PTSD symptoms, followed by exposure to civilian casualties, and sequentially those not exposed to any casualties. Prospectively, in a study of Kosovo peacekeepers, potentially traumatic events (eg. Patrolling in mined areas, unit coming under fire, visualizing dead or injured civilians) emerged as the strongest predictors of PTSD development after controlling for preservice PTSD symptoms (Maguen et al., 2006).

The soldier's perception of war-zone stressor exposure has been considerably highlighted as a determining factor towards PTSD formation. Sutker et al. (1995) when examining Gulf War veterans serving equivalent durations of deployment found that soldiers with PTSD reported increased war stress compared to their counterparts. Later in a sample of 15,000 Gulf War veterans, Kang and colleagues (2003) stratified the subjects by six levels of escalating self-reported duty-related stress and found that rates of PTSD increased with each level, with 3 percent at the lowest level and 23 percent at the greatest level of reported stress.

Coping strategies utilized in the war zone are associated with subsequent PTSD development. Sutker et al. (1995), in evaluating Gulf War veterans found that avoidance coping was the only strategy that predicted PTSD. This resonates with broader and recent findings that avoidance coping serves as a mediator towards peritraumatic dissociation

which in turn facilitates PTSD development (Pacella et al, 2013). Conversely soldiers who employed higher percentages of approach-based coping (i.e. active strategy to directly resolve the stressor) reported fewer post-deployment PTSD symptoms (Sharkansky et al., 2000). Additionally, it was discovered that the relationship between coping strategies and PTSD appears to be moderated by combat exposure, with a stronger negative association between approach-based coping and PTSD for soldiers who underwent greater combat exposure.

Protective factors against PTSD development other than coping styles and perception during combat have not been significantly highlighted. However, further domains of psychological research allude to other online factors of resilience. One such domain is that related to cognitive factors affecting freeze behavior in humans in response to threat. Alban and Pocknell (2017) measured the effect of motivational orientation on chosen responses (freeze, fight, or flee) to visual threat. With the effectiveness of all three responses held constant, it was discovered that loss-avoiders selected “freeze” more often than reward-seekers. The authors extrapolated that the extent that deciding to freeze could be interpreted as electing to take no action, the concept of maladaptive freezing may equate to learned helplessness (Seligman and Maier, 1967). This is significant as tonic immobility during trauma is associated with PTSD development, even after controlling for trauma severity and fear (Bovin, Jager-Hyman, Gold, Marx, and Sloan, 2008; Hagedaars, 2016). Hence, the motivational mindset of reward-seeking as opposed to loss-avoiding lends a protective value against traumatization. Deeper along the lines of real-time cognition, the evaluation of risk also determines the predominance or lessening of reflexive defensive behaviors such as freezing and tonic immobility.

Mobbs et al. (2007) found that an increased perception of uncontrollability is positively related with activation in the brain encoded for reflexive behaviors. Although not a protective factor per se, estimates of escapability and/or controllability are made from modifiable factors that tend the combatant towards the dampening of reflexive reactions

that lead to PTSD development: attention to present situational factors, awareness of available skill sets, and memories of what prior actions produced favorable outcomes (Hagenaars et al., 2014; Marx et al, 2008). As with cognition, on-line affective or emotion-related contributions to resilience against combat PTSD have also been traced but in the findings of psychological examination of underage combatants in the African crisis regions of Uganda and the Democratic Republic of Congo. These combatants were mostly children abducted and immersed into a culture of not only of warfare but of fascination with blood and violence.

Most notably, in these subjects' researchers have not found the expected prevalence of PTSD and other manifestations of mental illness that is concomitant with tremendous exposure to traumatic stressors and perpetration of brutal acts (Elbert, Weierstall and Schauer, 2010; Hecker et al., 2013). Postulate theory from these findings hold that the experiences from the actions of appetitive aggression, aggression that is planned, target-oriented and motivated from a hunting mindset, set up in the person a specific neuro-psychological "hunting" network composed of the related sensory, cognitive, and physiological memories. In contrast to the collection of over-consolidated memories from fear and trauma which is negative in terms of emotional valence, those resulting from appetitive aggression facilitate a positive mood (Elbert, Weierstall and Schauer, 2010). Therefore, this network of memories competes for mental resources with the fear network of memories accrued from prior trauma and thus confers resistance to the development of PTSD.

The Primary Prevention of Combat-Related PTSD (C-PTSD)

In addressing C-PTSD as a clinical entity, prevention approaches need to be framed according to the scope of said interventions and how these interventions should be classified. Historically, preventative interventions were categorized by the disease progression before symptom manifestation in the individual. This classification scheme

consists of primary, secondary, and tertiary prevention (Caplan, 1964). Primary prevention are those interventions provided before the biological onset of the disease and is aimed at reducing incidence. Examples are general health promotion or more specific interventions against a particular disease such as vaccines. Reduction of exposure to environmental risk factors or augmenting a person's resilience against present risk factors are considered primary prevention efforts (Rose, 1992). Secondary prevention is provided after the sufficient pre-conditions of the disease (i.e. exposure to a critical incident) have been inflicted but before the emergence of symptoms. Hence screening tests are used to detect early disease stages and secondary preventative measures are administered. Finally, tertiary prevention is that provided to halt disease morbidity after it has manifested to attenuate disability, and thus is often conjoined with treatment. Given that both ASD and PTSD require exposure to one or more traumatic incidents as sufficient precondition(s) for onset, primary prevention would be those interventions administered before exposure. The scope of this thesis will only explore and discuss primary prevention as

1. the importance of selecting the right combination of physical and cognitive abilities; but most especially grit and perseverance when physical and cognitive abilities are taxed by chronic stress; also demonstrated as aggression in high stress environments
2. how anxiety and fear in the recruit is slowly minimized through prolonged and intensive scenario training
3. the negative psychological impact of single high stress incidents on soldiers who have been serving for long deployments during which there has been low baseline frequencies of conflict; this has tended to happen even in very physically fit operators
4. the predominant importance of proper training: as the director and lead trainer at Protect Israeli Security Solutions for over 20 years, I have facilitated the process of changing human performance and behavior for extreme operational environments

replete with multiple stressors such as sleep deprivation, incomplete information, and tactically risky and dangerous mission profiles

5. I have noted that the rates of PTSD among Israeli armed forces to be much lower than that of the Western countries
6. in this dissertation I want to address the following questions in relation to positive individual warfighter and law enforcement professional outcomes such as achieving strategic and operational goals and minimal physical and psychological trauma:
 - in the selection and training processes what is the role of perseverance or grit and aggression?
 - in the deployment and high stress and high-risk theatre operations, how is behavioral control optimized
 - what is the cognitive process by which the adequate amount of readiness is engaged under conditions of extreme stress; and what is the right kind of scenario training to effectively instill it
 - e.g. the paratrooper dealing with an entangled chute
 - increased level of cognitive and physical readiness upon exit from aircraft
 - enactment of algorithm from training (appraisal, decision-making)
 - the importance of self-regulation to mitigate debilitating anxiety
 - e.g. clearing a room with incomplete information
 - how can cognitive readiness in high-risk operations be maximized with stress inoculation training: achieve self-regulation of emotional response

to threat; enact proper evaluation and prioritization of threat stimuli;
deployment of appropriate conditioned response to meet threat stimuli

- how can psychological trauma be sustainably minimized through proper stress inoculation training?
 - the importance of self-appraisal of informed consent and participation in high-risk operations that may lead to lethal injury and death
 - the value of scenario training that realistically simulates goal failure and mass casualty
 - the value of a functional level of anxiety as a means of facilitating readiness
- in post-deployment what are the special factors that promote effective recovery from psychological trauma?
 - societal reception
 - receive respect and honor from society and family
 - value of meaningful employment to facilitate self-efficacy
- what makes a hero? What are the characteristics of persons who commit extraordinary acts of courage and sacrifice?
 - certainly, acceptance and embracement of risks that may lead to death
 - the placement of others above oneself

Line of thought in research

There is a dearth of evidence on the primary prevention on PTSD. To date, there has not been developed a solid body of knowledge regarding the primary prevention of PTSD despite abundant clinical and academic work on the secondary and tertiary means of prevention and treatment (Riggs and Sermanian, 2012; Skeffington et al., 2013). The current best practice is to screen for pathology and provide treatment when required (Ibid, 2013).

Combat-related PTSD is elevated in operators in whose attention has been difunctionally altered to avoid threatening stimuli or is variable in orienting to threat and neutral stimuli. This has been shown to be ameliorated with attention bias modification training:

1. From a neurocognitive perspective, life threatening stimuli engages an avoidance bias or suppression of attention to the threat. This has been found to increase the risk of psychopathology that leads to PTSD (Bar-Haim, Holoshitz et al., 2010; Wald et al, 2013)
2. Frontal lobe (lateral prefrontal cortex) over processing of emotional stimuli can be tuned with psychological interventions that regulate levels of anxiety. Specifically, attention bias modification can change attention to threat/neutral stimuli via changes to the prefrontal cortex (Browning et al, 2010). PTSD is related to an overactive salience/limbic network and hypoactive control system in the prefrontal cortex (Hayes et al, 2012)
3. Attention bias modification trials shows promise as a means to prevent PTSD in recent research:
 - a) Acute stress may lead combatants to shift their attention away from threats, perhaps to minimize exposure. ABM was used to shift the attention of a treatment group toward threat and shown to have less acute stress symptoms. However, ABM cannot generate stress that is like combat. Hence naturalistic

designs are needed to explore the relationship between attention and symptomatic responses to stress (Wald et al, 2011)

- b) Direct training of threat-related attention correlates with changes in brain structure activation: greater threat-related anxiety symptom reduction was associated with a treatment group receiving ABM corresponding to decreased left amygdalar activity (Britton et al., 2015)
- c) Attention control training (attention trained to equally distribute to threat and neutral stimuli) reduces attention bias variability and attention bias in Israeli and US veterans. This corresponded with a reduction in PTSD symptoms (Badura-Brack et al, 2015)
- d) Four sessions of ABM vs. 8 vs. control, prior to combat deployment mitigated PTSD risk following combat exposure in a large sample size (N=719) study. (Wald et al, 2016)
- e) ABM moderates the association between combat exposure and stress-related symptoms. Sample size N=99. (Wald et al, 2017)

The ultimate goal of stress training is to transfer learned skills to the real-world or operational environment. Because many task environments of interest to the applied researcher are characterized by a high degree of uncertainty and unpredictability, it is difficult to anticipate the exact nature of the transfer environment during training. Therefore, one question that has considerable theoretical and applied import is whether the skills taught in stress training are domain specific or whether they transfer to novel stressor and task settings that differ from the exact conditions of the training environment. The present study suggests that by designing stress training to focus on the structural similarities in the training and transfer environments, skills learned can be generalized to novel settings.

There are several important benefits of this initial research study. The first was the development of an event-based scenario, developed by experienced subject matter experts,

representing critical law enforcement events. Second, this research scenario was shown to be a realistic and highly stressful simulation of these real-life incidents. Third, this research identified a number of performance deficiencies in a research population that had previously received comprehensive basic training on these tasks. These deficiencies included poor decision making, tunnel-vision or perceptual narrowing, memory deficits, use of improper procedures, and poor communications. One further implication of this initial research was the establishment of the requirement to develop stress training interventions to offset the observed performance deficiencies. Current research efforts in the second phase of this research program are being devoted to developing event-based stress training procedures, modeled on the stress exposure training paradigm, to optimize law enforcement officers' performance in stressful encounters. In brief, this research program represents one of the most ambitious and comprehensive applied research efforts to examine stress effects and stress training in a real-world setting.

These contradicting results suggest that information per se is not a panacea for stress reduction, and that additional conditions must be satisfied to make information useful. What these conditions are we learned, partly, from laboratory and field studies, and partly from our own personal experience.

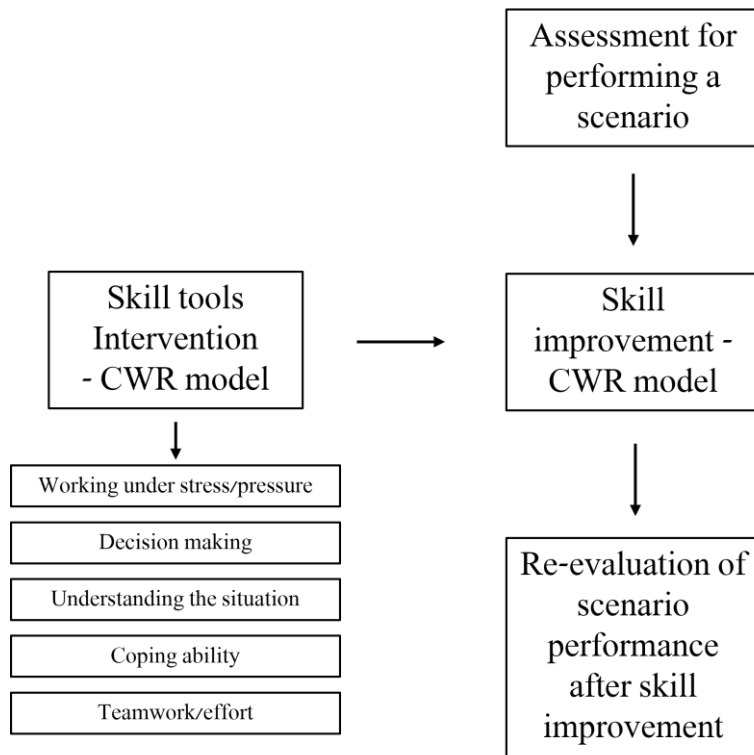
Methodology

Research Design

A review of the literature helped set the precept for the research design. This research will be conducted as qualitative methods, using observation. Qualitative methods generally aim to understand the experiences and attitudes weather its patients, members of any community or other specialists and researchers. These methods aim to answer questions about the ‘what’, ‘how’ or ‘why’ of a phenomenon rather than ‘how many’ or ‘how much’, which are answered by quantitative methods (McCusker & Gunaydin, 2014).

Qualitative methods have been chosen for conducting this research because it can provide a wide knowledge. Qualitative research also aims to reveal the reality. Since the reality is absolute and correct, there is a need to explore different perspectives of that reality by constricting clear and experiential memory that will help us to explain the complexity of the issue (Shalsky & Alpert, 2007).

Research Model



Scenario Design

The scenarios on which performance evaluations were conducted are operational scenarios, as part of the training of commando units in the Israeli army and other special units around the globe. As part of the training, commandos, and Special Forces (military, enforcement authorities and others) are required to deal with various scenarios, including taking over buildings and locating terrorists, face-to-face confrontation with terrorists, freeing hostages, cleaning/clearing buildings from hostiles, etc.

In each scenario, the participants (Special Forces soldiers and anti-terror police squads) are required to plan their mode of operation according to the event and the

intelligence on ground and carry out the actual planning. For each scenario, an examiner joins and observes the event, from beginning to end, and provides a score according to pre-defined criteria and based on the model. It is important to note that all the scenarios are planned according to the nature of the single activity and there is no intervention in the content of the activity.

Brief descriptions of these events follow:

- 1) Locate the release of hostages inside a building.
- 2) Taking over a terrorist/terrorist inside a building.
- 3) Dealing face-to-face with a terrorist/terrorists.
- 4) Dealing with an attack on a convoy.

CWR Model

The model developed for this study is **CWR** that is based on three main stages: Crawl, Walk, Run. The model was developed over extensive experience in training army special forces and anti-terrorism police units, and it represents three phases in the evolution of a professional fighter:

- 1) Crawl - The first phase is the crawling stage, where the warrior receives basic tools that enable him to react and function in a basic way in combat situations, similar to the crawling of a baby who just learn how to move by himself.
- 2) Walk - The second phase is the walking stage, in which the warrior practices the scenarios using purpose-oriented professional tools that enable him to react and function in a more professional way in combat situations, similar to the walk stage that comes after crawling when the baby grows.
- 3) Run - The third phase is the running stage where the fighter performs the skills continuously that enable him to react and function in the right professional way in

combat situations, Similar to a child's running that becomes possible after practicing steady walking.

The model is based on several key assumptions, where the main goal is the examination of human behavior and performance under pressure, as well as the examination of changing behavior habits among fighters in commando units, and teams in special police units. The operation process of the model includes three main stages, which examine the actions taken by the fighters under pressure:

1. learning action
2. Applying pressure
3. Repetitive action attempt

The Evaluation Method Design

The rationality on which the research action model was built, is based on creating a **negative experience** in the participant (and later change to a positive experience) that has the power to take the combat warrior to the place where he failed to perform the action expected from him, and through professional, behavioral, and psychological tools which are given to him, enable to improve and correct his function in battle and present improved tactical performances. The negative experience according to the model is also known as "**Crash Test**".

”**Crash test**” is a set of actions that Makes the combat fighter face scenarios in the end of which he fails to perform. That is, the goal is to make the combat fighter understand through the various scenarios, what are the negative results of the actions he performs, not only in terms of the failed operational result, but also in terms of the mental failure.

The assumption is, that to successfully carry out the mission and display improved operational capabilities, the fighter is required to **experience failure**. Thus, through failure in training, the mental skill of the fighters can be improved, and they can be better prepared for extreme situations. The change in their **mindset**, forms the basis for the required change.

The way proposed through the research model is to build the self-belief of the fighters through the operational failure in training. The prevailing perception is, that failure can improve mental resilience, reduce situations where the fighters freeze in complex events and combat events, and deal with a stressful environment in a positive way.

Research Tool

For the current study, a unique model was developed - CWR, based on extensive knowledge and experience gained during 25 years of operational activity and training of special units in the Israeli army, including police and counterterrorism units. The main goal of the model is to examine the behavior of fighters who are in complex operational conditions that require them to cope under pressure with planning missions and carrying them out.

The model (CWR) makes it possible to determine the degree of risk to which the soldier is exposed after a single or prolonged operational activity. The evaluation of the warrior is divided into three main stages:

- 1) **Evaluation before intervention** – Allow us to evaluate the mental, behavior ability and performance of the participants before intervention.

- 2) **Intervention** – Techniques and skills that are part of the CWR, includes the intervention techniques that combat warriors go through as part of Model's training tools.
- 3) **Evaluation after intervention** - Allow us to evaluate the mental, behavior ability and performance of the participants after intervention.

In order to test the model, an evaluation key was developed that allows the behavior of the fighters to be rated based on fixed evaluation indicators. The dimensions that are examined include: Working under stress/pressure; Decision making; Understanding the situation; Coping ability; Teamwork/effort.

Table No.1 – CWR evaluation key

Dimension	Very high ability (1)	High Ability (2)	Average Ability (3)	Low Ability (4)	Very Low Ability (5)
Working under stress/pressure					
Decision making					
Understanding the situation					
Coping ability					
Teamwork/effort					

The subjects in the study

As part of the study, the activity of several commando units and special forces from the Israeli army was examined: Commando unit Magellan 212 ,(Army), Duvdevan 217 Unit (Army), and Yamas 504 (Army Intelligence).

Unit Magellan (212) - The Magellan Unit (Unit 212) is a commando unit in the IDF, specializing in destroying quality targets deep in the battlefield and creating military intelligence. It is important to note, that the soldiers who enlist in unit 212 belong to the regular army, which means that they receive a different scope of training.

YAMAS – Yamas Unit is an Israeli Border Police tactical unit. It conducts covert and special operations, counterterrorism, irregular warfare, and high-risk arrest and search warrants. The unit is directly subordinate to Shin Bet. It uses Arab disguises to infiltrate and conduct missions in Arab territories. The unit's sniper teams have won numerous awards and are considered among the best in Israel

Duvdevan Unit (217) - Unit 217, also called Duvdevan, is an undercover unit in the Commando Brigade of the IDF. It is notable for its undercover operations in urban areas, during which its operators often wear civilian clothing to disguise themselves among the local Arab populace.[1] The unit is also known to have highly trained members in both human and mechanical counter-surveillance. Unit 217 performs many high-risk and complicated operations, including targeted killings of militants and a range of other undercover operations in Arab regions, many of which are classified.

Procedures

The entirety of the current study conducted by integrating within the regular training program of the units. As part of the training program, it was suggested that the units incorporate the unique program developed and presented in the current study. The scenarios used as part of the training of the units were built according to the needs of each unit and in relation to the training and training program used in those units.

All participants were informed about the procedures and gave written consent before participating in the study. There were no specific diagnostic criteria required for entry, and all participants were required to complete a personal history questionnaire as well as

completing the State Trait assessment prior to enrollment. Only volunteers were selected for inclusion in the study.

Analyses

All data that was collected in this research analyzed in two phases:

- 1) The data of each unit was compiled into tables that are divided into the different phases based on the scenarios that were activated, where the data of each phase and each scenario were compiled into tables and averaged in order to examine the effects of the scenario on the unit. After the intervention program was implemented, the averages were calculated in order to examine whether there was a change in the performance of the staff and the commanders.
- 2) All the data were entered into the SPSS software and various statistical analyzes were performed from it to examine trends.

Ethics

The information collected for the research will be stored and mentioned in a way that could protect the privacy of participants that would like to stay in the shade. Participants will be informed that they are participating in this research in their own free will and not getting paid. The results from the observation and evaluation will be processed in a manner of 'true to the truth' to provide reliable outcomes (Karnieli, 2010).

Results

In the current chapter, the results of the intervention in each unit will be presented based on a set of scenarios. The chapter is divided into three main parts based on the CWR model: in the first stage, the findings of each unit will be presented based on the relevant stage (Crawl, Walk, Run). Each step in the model will be divided into two parts: the first part will present the performance evaluation in each scenario before the intervention, and the performance evaluation in each scenario after the intervention.

Unit 212 (Magellan) performance evaluation

As part of the evaluation of the operational performance of unit 212, various scenarios were carried out according to the description of the unit's operational activity. After each scenario the team was rated based on their performance. After the intervention

process, the team up to the individual warrior, were required to perform the same scenario again, when at the end the team received a renewed assessment. Furthermore, each team had to assess its own commanding officer/team leader.

Unit level assessment and evaluation

Stage – Crawl

During the Crawl phase, 6 basic scenarios were performed for the teams in the unit. Each team was required to perform the scenario twice, with each performance being re-evaluated. Between the execution of each scenario, an intervention was carried out that included a video analysis of the execution. After the intervention the team came back and offered the scenario again and then a reassessment was done. All the data is shown below in Tables No. 2 and No. 3:

Table No.2: Evaluation before intervention – Stage: Crawl – Unit 212 (Magellan)

Scenario	#1	#2	#3	#4	#5	#6
Dimension						
Working under stress/pressure	4	4	5	3	4	3
Decision making	5	5	5	4	4	3
Understanding the situation	4	5	5	4	3	4
Coping ability	5	4	4	4	4	3
Teamwork/effort	5	4	5	5	4	2
Average Scenario	4.6	4.4	4.8	4	3.8	3

From the data as shown in Tables 2 and 3, in all scenarios there was a positive change in the level of performance (on average) after the intervention. For example, in scenario #1,

the average performance of all indicators was 4.6, but after the intervention, the average performance of all indicators was 4.4.

Table No.3: Evaluation after intervention – Stage: Crawl – Unit 212 (Magellan)

Scenario	#1	#2	#3	#4	#5	#6
Dimension						
Working under stress/pressure	4	4	4	3	3	2
Decision making	5	3	4	4	3	2
Understanding the situation	4	4	5	2	2	1
Coping ability	5	5	4	3	3	2
Teamwork/effort	4	4	3	3	3	1
Average Scenario	4.4	4	4	3	2.8	1.6

The data also show that the level of performance continues to improve after the intervention. For example, the average evaluation in scenario #4 before the intervention was an average of 4, but after the intervention the average evaluation of the performance was 3. A substantial change can also be seen in scenario #6, where before the intervention the evaluation of the performance was an average of 3, while after the intervention the evaluation of the performance was in scenario 6 on an average of 1.6.

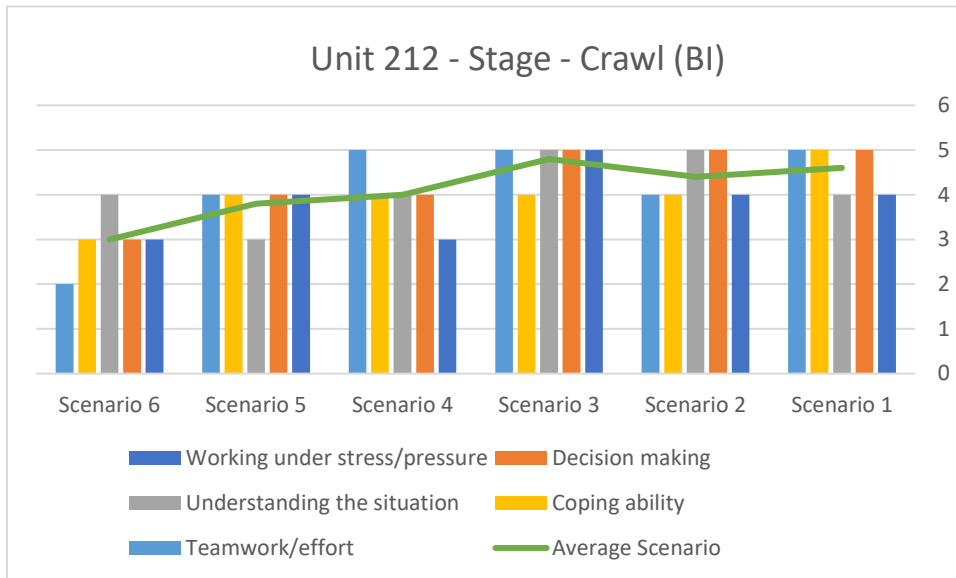


Figure No.1: Unit 212 (Magellan) – Stage: Crawl – Evaluation before intervention

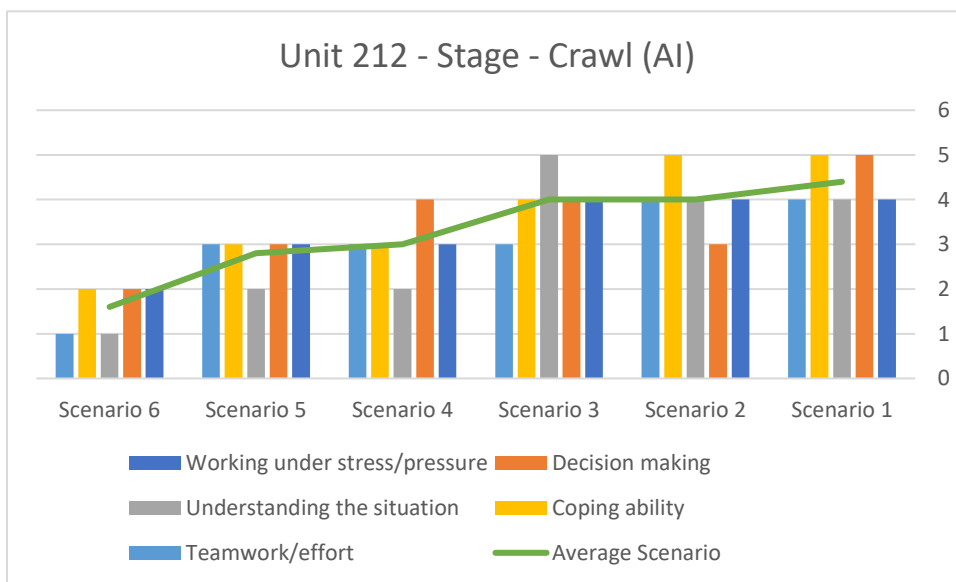


Figure No.2: Unit 212 (Magellan) – Stage: Crawl – Evaluation after intervention

The data also shows that the team's performance improves as they continue to practice the various scenarios and so their starting point is also better. For example, an improvement can be seen in the performance scenarios before the intervention, when in scenario #1 the average evaluation was 4.6, however, as the team continued to experiment and implement the evaluation from the intervention plan, the average evaluation improved

even before the intervention program was activated, with the average evaluation in scenario #6 before the intervention, stood on average 3.

Stage – Walk

During the Walk phase, 6 more complex scenarios were performed for the teams in the unit. The walk phase includes a more complex series of scenarios that involve increasing the level of difficulty. This is a stage where unexpected events are combined, and it constitutes a new cognitive practice for the team.

Like the Crawl phase, also in the Walk phase, each team (and individual) was required to perform the scenario twice, with each performance being re-evaluated. Between the execution of each scenario, an intervention was carried out that included a video analysis of the execution. After the intervention the team came back and offered the scenario again and then a reassessment was done. All the data is shown below in Tables No. 4 and No. 5:

Table No.4: Evaluation before intervention – Stage: Walk – Unit 212 (Magellan)

Scenario	#1	#2	#3	#4	#5	#6
Dimension						
Working under stress/pressure	5	5	4	4	4	4
Decision making	4	4	4	4	5	4
Understanding the situation	4	4	3	4	4	4
Coping ability	5	5	4	5	4	4
Teamwork/effort	4	4	3	4	4	3
Average Scenario	4.4	4.4	3.6	4.2	4.2	3.8

Table No.5: Evaluation after intervention – Stage: Walk – Unit 212 (Magellan)

Scenario	#1	#2	#3	#4	#5	#6
Dimension						
Working under stress/pressure	4	4	3	4	3	3
Decision making	3	2	2	3	3	3
Understanding the situation	2	1	2	2	2	1
Coping ability	2	2	2	3	2	2
Teamwork/effort	2	1	1	1	2	1
Average Scenario	2.6	2	2	2.6	2.4	2

From the data as shown in Tables 4 and 5, The improvement in the averages of the performance evaluations were also high after running an intervention between scenarios. For example, the average performance evaluation after scenario 1 was 4.4, while after the intervention program was launched, the average evaluation for the scenario was 2.6.

A considerable improvement can also be seen in the continuation of the execution of the scenarios, where in scenario 6, for example, before the intervention program was implemented, the average evaluation was 3.8, while after the intervention program was implemented, the evaluation average in the same scenario 6 was a total of 2.

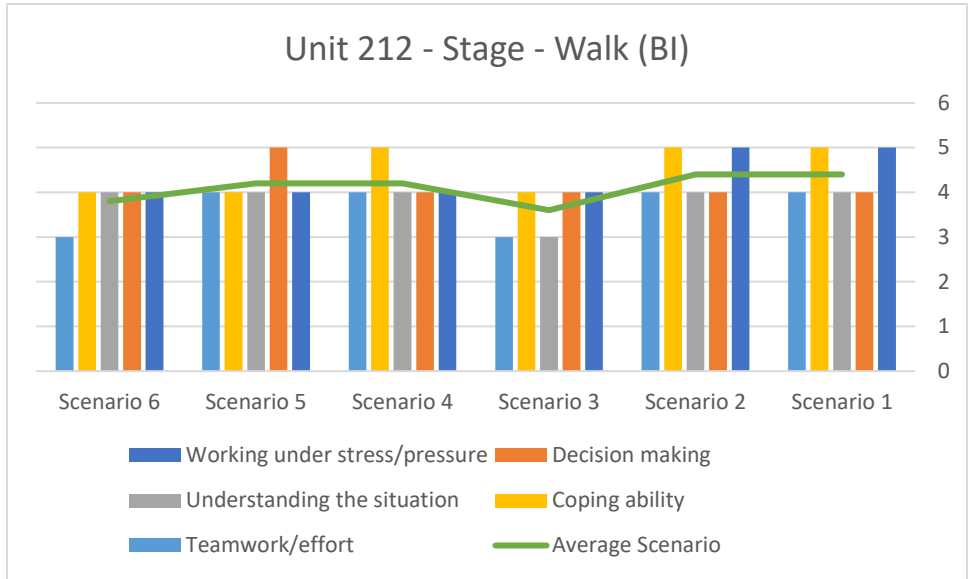


Figure No.3: Unit 212 (Magellan) – Stage: Walk – Evaluation before intervention

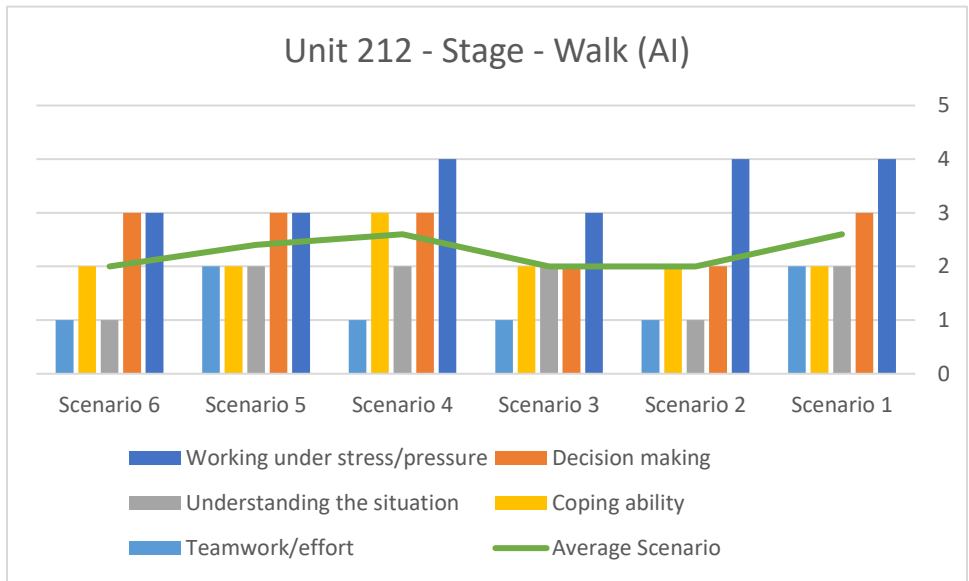


Figure No.4: Unit 212 (Magellan) – Stage: Walk – Evaluation after intervention

It is important to note that the change in the level of difficulty of the scenarios led to a certain regression in the evaluation average at the beginning of the phase, compared to the performance evaluation averages in the crawling phase after the intervention. That is,

increasing the difficulty of the scenarios required a different behavioral change of the team members in order to meet the required achievements of the scenario.

Stage – Run

During the Run phase, 6 more complex and enhance scenarios were performed for the team's members in the unit. The Run phase includes a more complex series of scenarios that involve increasing the level of difficulty such as pyrotechnics (Smell, Sound, Smoke). This is a stage where unexpected events are combined with pyrotechnics, and it constitutes a new cognitive practice for the team level and the individual level.

Like the Walk phase, also in the Run phase, each team (and individual) was required to perform the scenario twice, with each performance being re-evaluated. Between the execution of each scenario, an intervention was carried out that included a video analysis of the execution. After the intervention the team came back and offered the scenario again and then a reassessment was done. All the data is shown below in Tables No. 6 and No. 7:

Table No.6: Evaluation before intervention – Stage: Run – Unit 212 (Magellan)

Scenario	#1	#2	#3	#4	#5	#6
Dimension						
Working under stress/pressure	4	4	4	3	4	4
Decision making	4	3	4	4	3	4
Understanding the situation	4	4	3	4	4	3
Coping ability	4	5	3	4	4	4
Teamwork/effort	4	4	3	3	4	4
Average Scenario	4	4	3.4	3.6	3.8	3.8

Table No.7: Evaluation after intervention – Stage: Run – Unit 212 (Magellan)

Scenario	#1	#2	#3	#4	#5	#6
Dimension						
Working under stress/pressure	2	3	2	2	3	3
Decision making	2	2	2	1	2	2
Understanding the situation	2	1	1	2	2	3
Coping ability	2	2	3	3	2	3
Teamwork/effort	1	2	2	2	2	1
Average Scenario	1.8	2	2	2	2.2	2.4

Like the earlier stages in the model, also in the running stage the average performance before the intervention program was launched was relatively high, despite the experience gained at the team and individual level. For example, in scenario 1, the average performance evaluation was 4, and the average performance evaluation of scenario 6 was 3.8. At the same time, the improvement came after the implementation of the intervention program, so that the average performance evaluation in the repeated first scenario was 1.8, while the average performance evaluation of the concluding 6th scenario was 2.4.

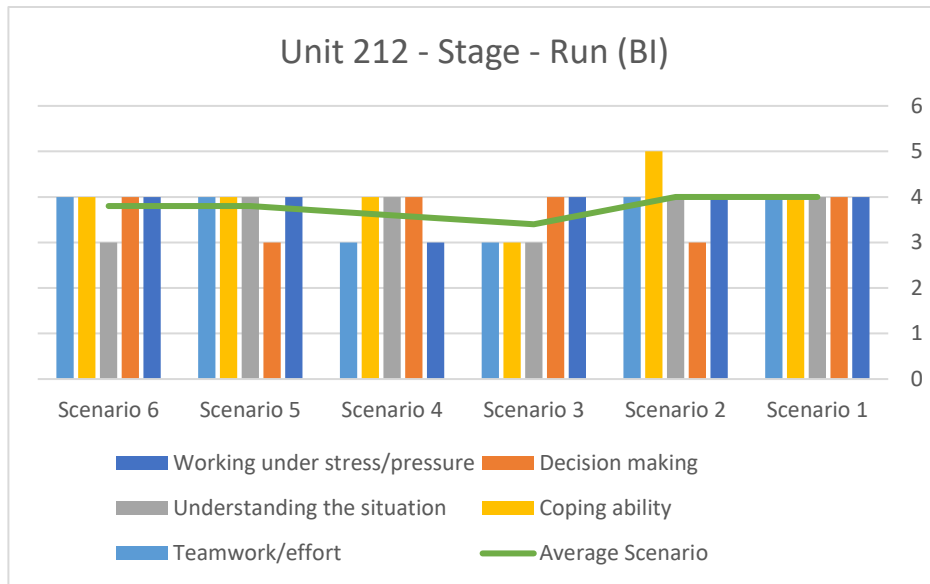


Figure No.5: Unit 212 (Magellan) – Stage: Run – Evaluation before intervention

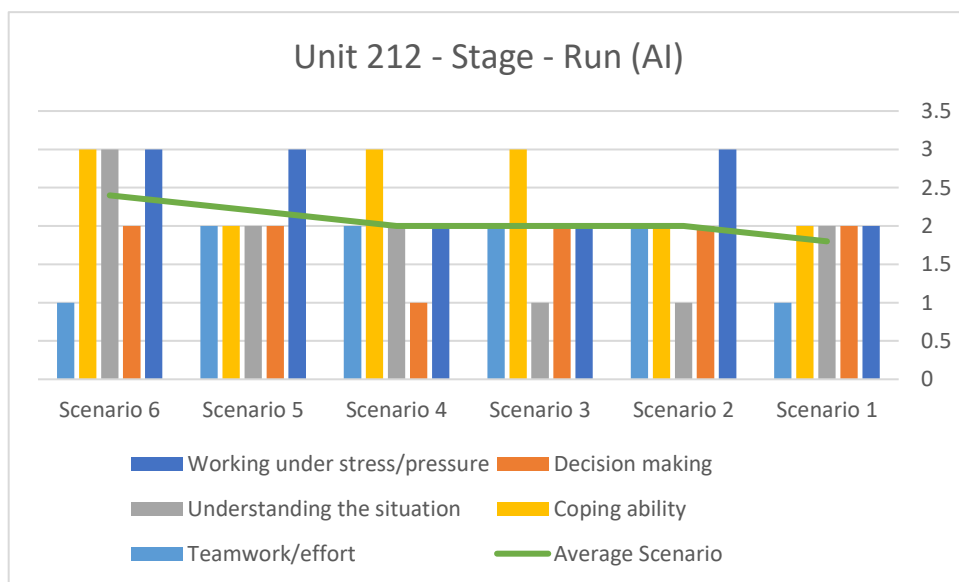


Figure No.6: Unit 212 (Magellan) – Stage: Run – Evaluation after intervention

It is important to note that the increase in the level of difficulty of the scenarios may lead to an increase in the feeling of the negative experience of the team members or the individual and therefore it also affects the evaluation averages after the intervention. For example, in the running phase, you can see a trend of an average increase from scenario 1 to scenario 6 (Figure no. 6). At the same time, it is still possible to point to a significant

improvement in the team's performance evaluations with the increased sense of self-efficacy and self-confidence acquired during the intervention program.

Team leader level assessment and evaluation

In addition to the evaluation of the entire team that participated in the training, the fighters themselves rate the performance of the team commander at the end of each scenario. The commander's performance evaluation has a significant impact on the performance of the entire team and the ability to complete the relevant task assigned to the team. The goal of performance evaluation for the commander is to lead to the improvement of the commander's performance through the negative experience and to optimally build the command capabilities.

Stage – Crawl

The data collected from all the participants in the participating team are presented below in tables 8 and 9:

**Table No.8: Leadership Evaluation before intervention – Stage: Crawl – Unit 212
(Magellan)**

Scenario	#1	#2	#3	#4	#5	#6
Dimension						
Working under stress/pressure	5	4	5	4	4	4
Decision making	5	4	5	4	4	3
Understanding the situation	4	5	4	4	4	4
Coping ability	5	5	4	4	5	3
Teamwork/effort	5	4	5	5	4	4

Average Leadership team evaluation	4.8	4.4	4.6	4.2	4.2	3.6
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Table No.9: Leadership Evaluation after intervention – Stage: Crawl – Unit 212 (Magellan)

Scenario / Dimension	#1	#2	#3	#4	#5	#6
Working under stress/pressure	4	4	4	3	3	2
Decision making	3	3	4	3	3	1
Understanding the situation	4	4	5	2	2	1
Coping ability	3	4	4	3	2	2
Teamwork/effort	3	3	2	3	2	1
Average Leadership team evaluation	3.4	3.6	3.8	2.8	2.4	1.4

From the analysis of the data, it appears that the average performance evaluation of the team commander before the intervention was relatively low, and it stood at 4.8 after the first scenario. The ratings of the team members and the commander performance improves during the progress of the training, and it shows that the intervention average in the 6th scenario before the intervention is activated, drops to 3.6.

On the other hand, After the intervention is implemented, team members improve the commander's rating significantly. For example, after the end of the first scenario, the commander was rated an average of 3.4 (compared to an average of 4.8 in the same scenario before the intervention), and in the 6th scenario, the average evaluation of the performance of the team members was 1.4, compared to 3.6 before the intervention. That is, it is possible

to see an improvement in alienation in the activity of the team commander after the intervention program was implemented.

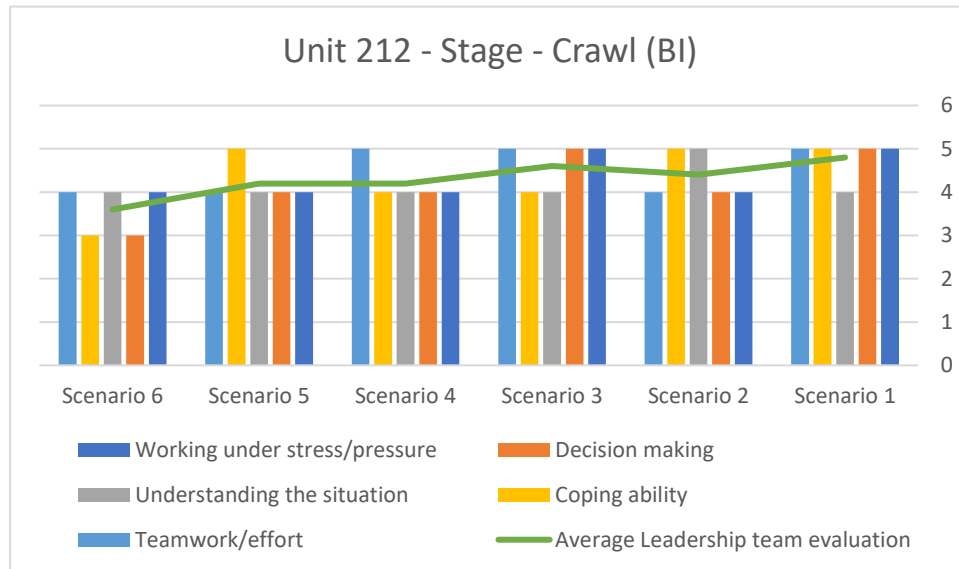


Figure No.7: Unit 212 (Magellan) – Stage: Crawl – Leadership team evaluation before intervention

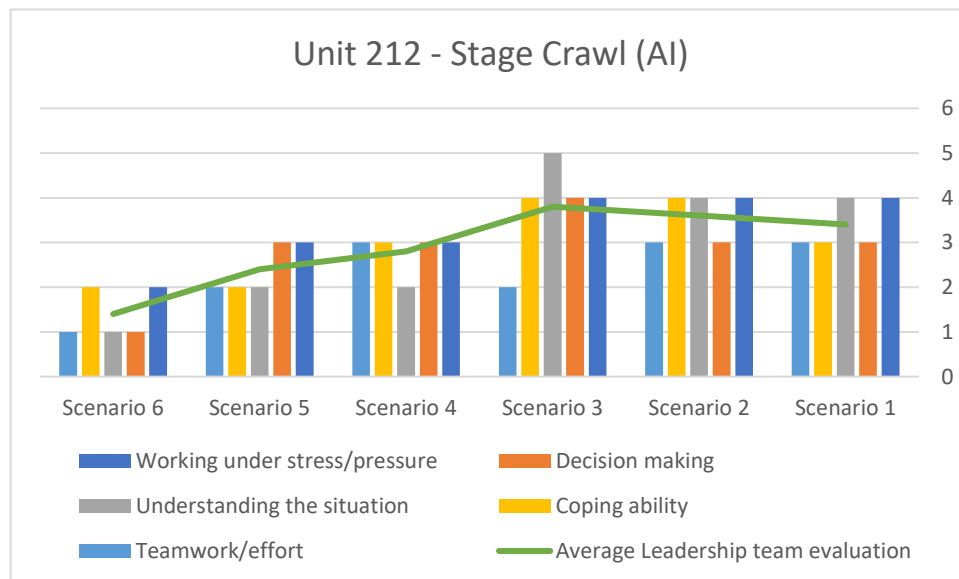


Figure No.8: Unit 212 (Magellan) – Stage: Crawl – Leadership team evaluation after intervention

The improvement trend as seen in Figure 8 is higher compared to the improvement trend before the intervention (Figure 7). This can be explained in the way that in any case

the team buys into the commander, but he strengthens or refines after the team feels that he manages better during the various scenarios.

Stage – Walk

The data collected from all the participants in the participating team are presented below in tables 10 and 11:

**Table No.10: Leadership Evaluation before intervention – Stage: Walk – Unit 212
(Magellan)**

Scenario	#1	#2	#3	#4	#5	#6
Dimension						
Working under stress/pressure	4	4	4	4	4	4
Decision making	4	4	4	4	4	4
Understanding the situation	4	3	3	4	4	4
Coping ability	5	4	4	4	4	3
Teamwork/effort	4	4	3	4	4	3
Average Leadership team evaluation	4.2	3.8	3.6	4	4	3.6

**Table No.11: Leadership Evaluation after intervention – Stage: Walk – Unit 212
(Magellan)**

Scenario	#1	#2	#3	#4	#5	#6
Dimension						
Working under stress/pressure	3	4	3	3	3	3
Decision making	3	3	2	2	2	2

Understanding the situation	2	1	2	2	2	1
Coping ability	2	2	2	2	2	1
Teamwork/effort	2	1	1	1	2	1
Average Leadership team evaluation	2.4	2.2	2	2	2.2	1.6

From the analysis of the data, it appears that there is a substantial improvement in the averages at this stage especially after the intervention. During the walking phase, the commanders are required to deal with more complex scenarios that include, among other things, pyrotechnics, and extreme scenarios, so after the intervention there is a substantial improvement in the way the team members evaluate the team leader who led them. For example, in scenario #6, the evaluation average before the intervention program was 3.6, while after the intervention it was a substantial improvement that led to an improvement of the average to 1.6.

Figure No.9: Unit 212 (Magellan) – Stage: Walk – Leadership team evaluation before intervention

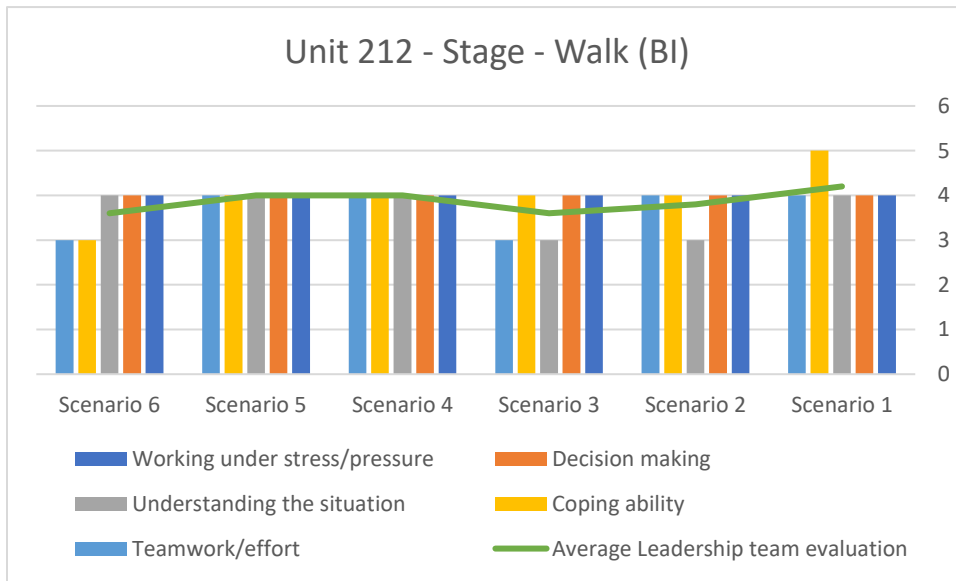
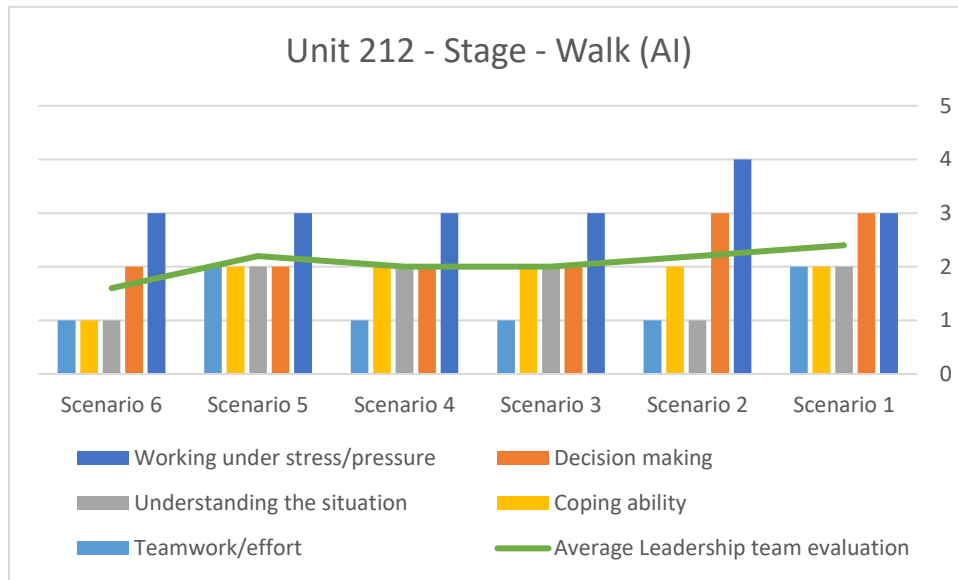


Figure No.10: Unit 212 (Magellan) – Stage: Walk – Leadership team evaluation after intervention



Stage – Run

The data collected from all the participants in the participating team are presented below in tables 12 and 13:

Table No.12: Leadership Evaluation before intervention – Stage: Run – Unit 212 (Magellan)

Scenario \ Dimension	#1	#2	#3	#4	#5	#6
Working under stress/pressure	4	3	4	3	5	4
Decision making	4	3	3	4	3	3
Understanding the situation	4	3	3	3	4	4
Coping ability	4	4	3	4	3	4
Teamwork/effort	4	4	3	3	4	4

Average Leadership team evaluation	4	3.4	3.2	3.4	3.8	3.8
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**Table No.13: Leadership Evaluation after intervention – Stage: Run – Unit 212
(Magellan)**

Scenario	#1	#2	#3	#4	#5	#6
Dimension						
Working under stress/pressure	2	3	2	2	3	3
Decision making	2	2	2	1	2	2
Understanding the situation	2	1	1	2	2	2
Coping ability	2	2	3	3	2	2
Teamwork/effort	1	1	1	1	1	1
Average Leadership team evaluation	1.8	1.8	1.8	1.8	2	2

From the analysis of the findings, it appears that in the running phase where the scenarios that the team commander is required to deal with as a commander are more complex, however, as was also shown in the earlier stages, there is significant vanity in the evaluation he receives from the other team members before and after the intervention plan is activated.

Figure No.11: Unit 212 (Magellan) – Stage: Run – Leadership team evaluation before intervention

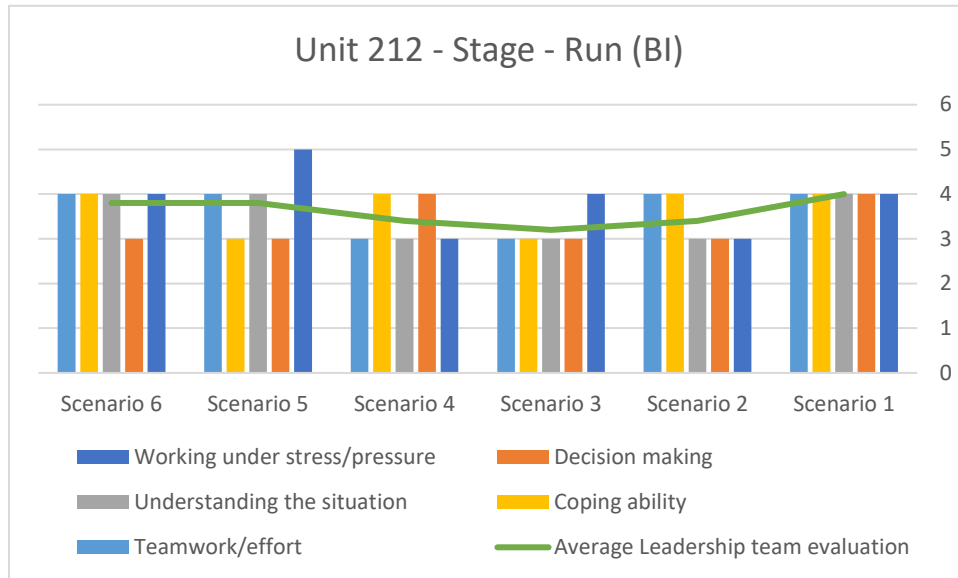
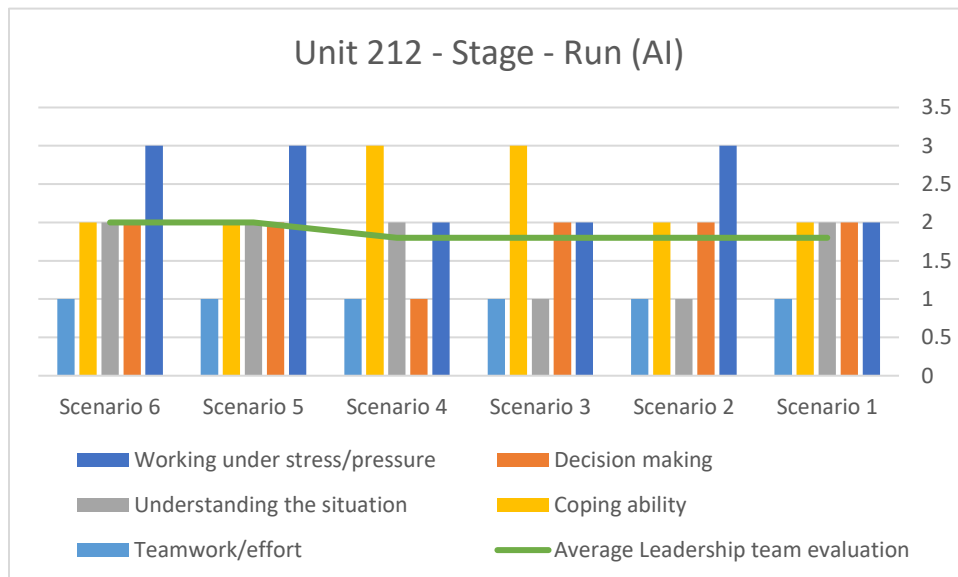


Figure No.12: Unit 212 (Magellan) – Stage: Run – Leadership team evaluation after intervention



Duvdevan Unit (217) performance evaluation

Unit level assessment and evaluation

Stage – Crawl

Figure No.13: Unit 217 (Duvdevan) – Stage: Crawl – Evaluation before intervention

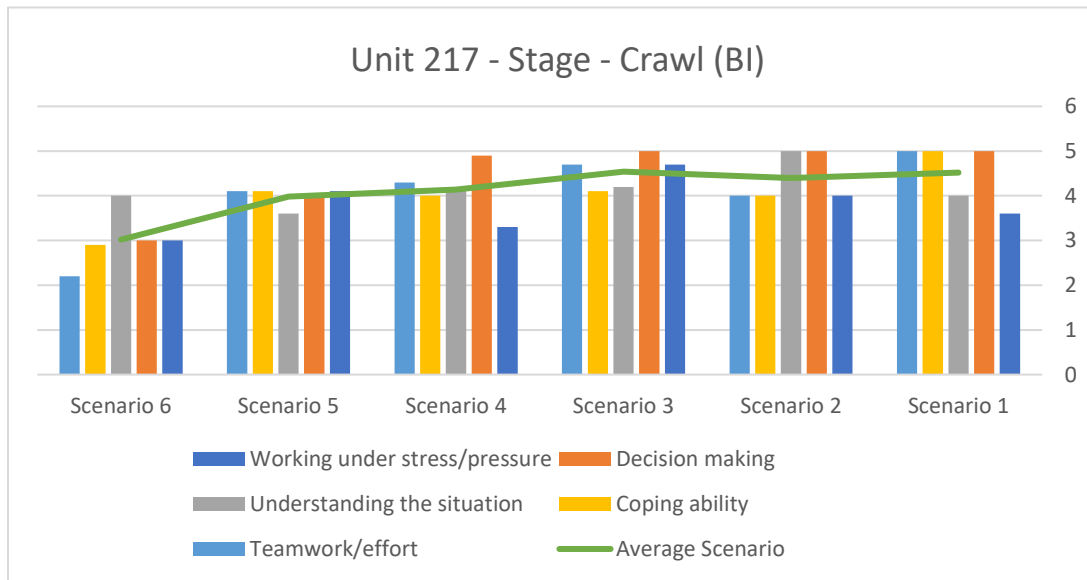
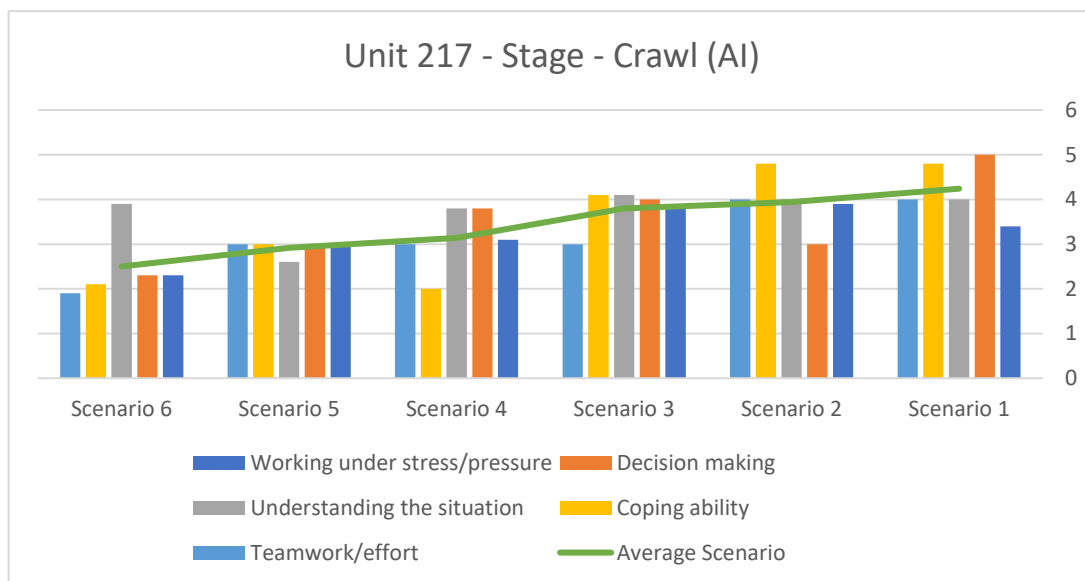


Figure No.14: Unit 217 (Duvdevan) – Stage: Crawl – Evaluation after intervention



Stage – Walk

Figure No.15: Unit 217 (Duvdevan) – Stage: Walk – Evaluation before intervention

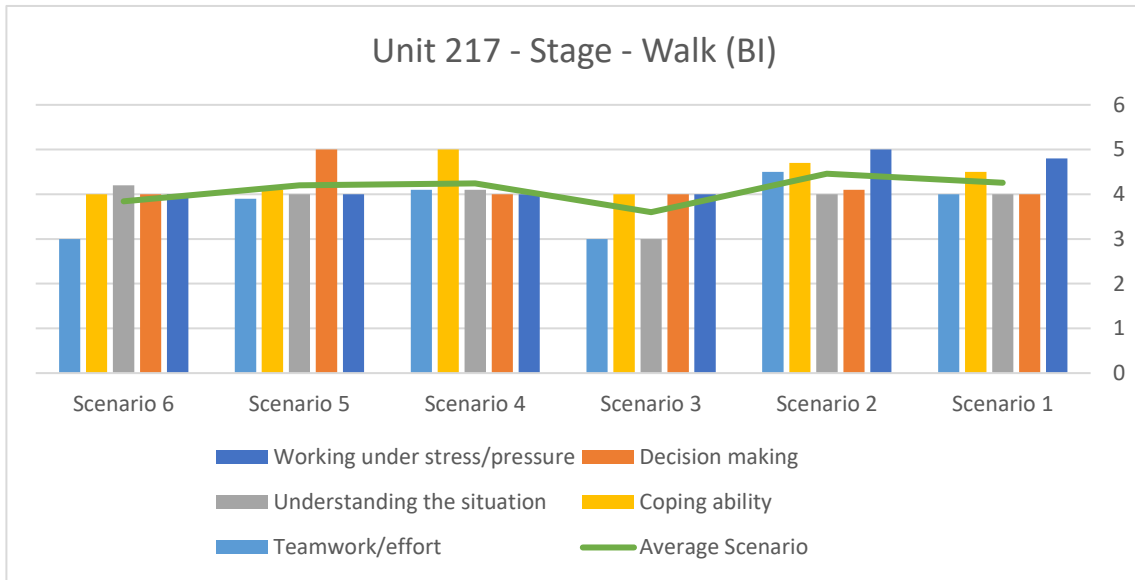
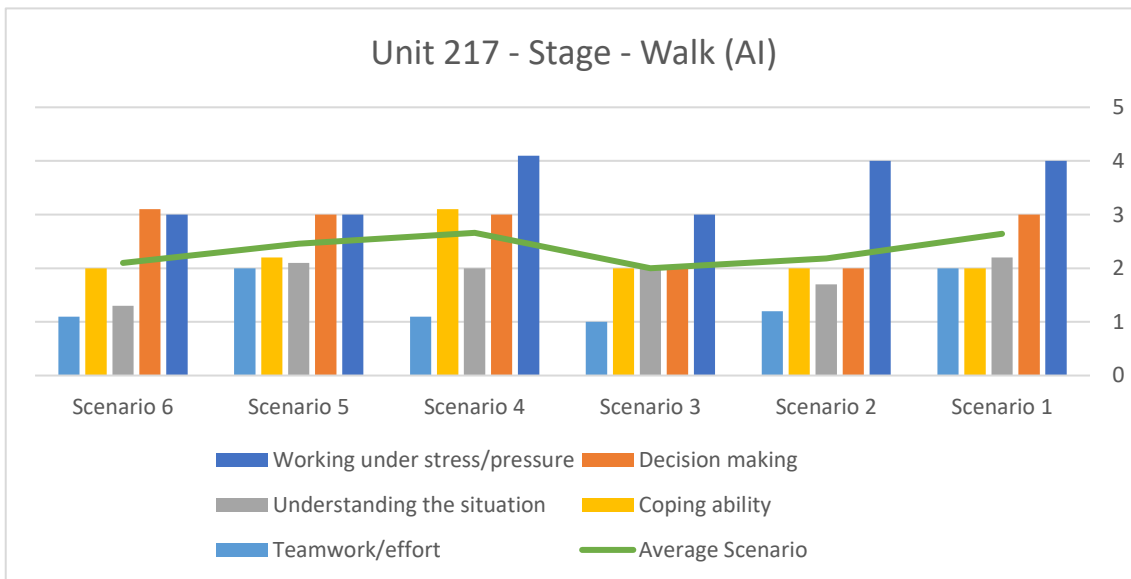


Figure No.16: Unit 217 (Duvdevan) – Stage: Walk – Evaluation after intervention



Stage – Run

Figure No.17: Unit 217 (Duvdevan) – Stage: Run – Evaluation before intervention

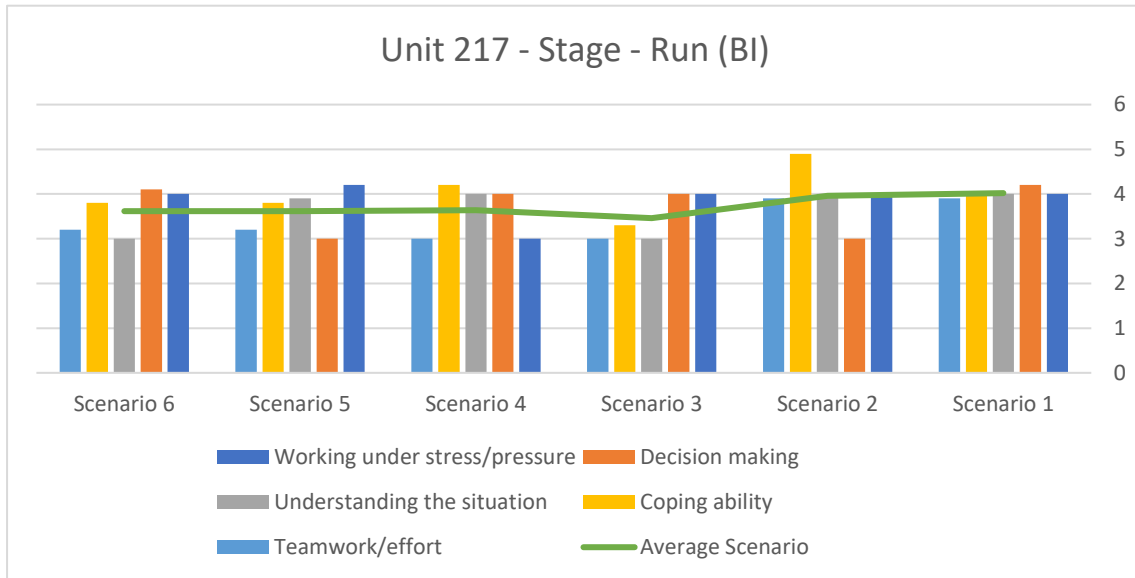
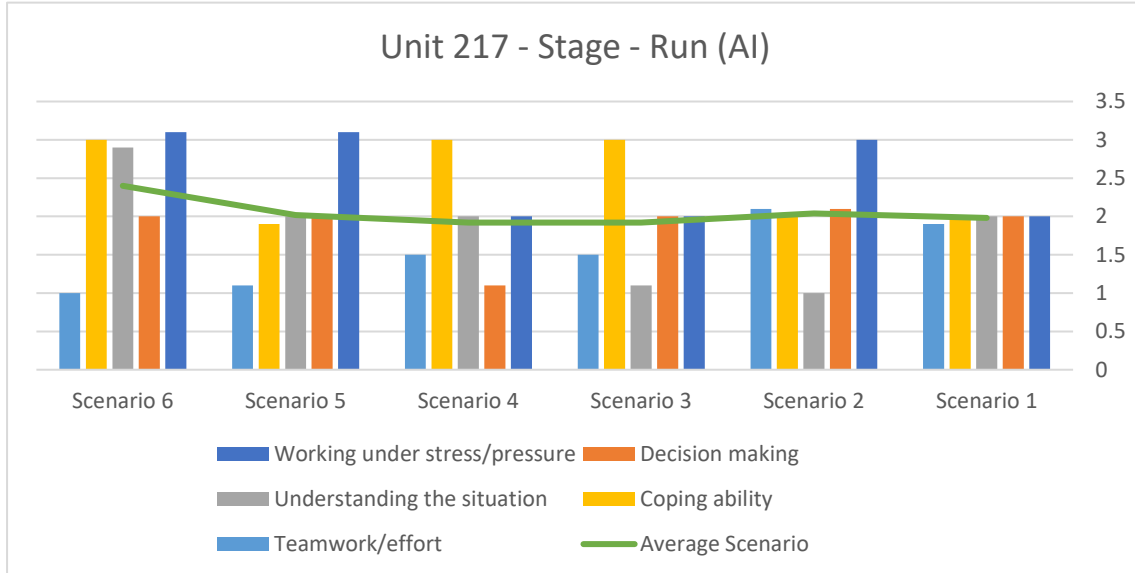


Figure No.18: Unit 217 (Duvdevan) – Stage: Run – Evaluation after intervention



From the analysis of the data, it appears that there is a substantial improvement in the averages at all stages especially after the intervention.

Team leader level assessment and evaluation

Stage – Crawl

Figure No.19: Unit 217 (Duvdevan) – Stage: Crawl – Leadership team evaluation before intervention

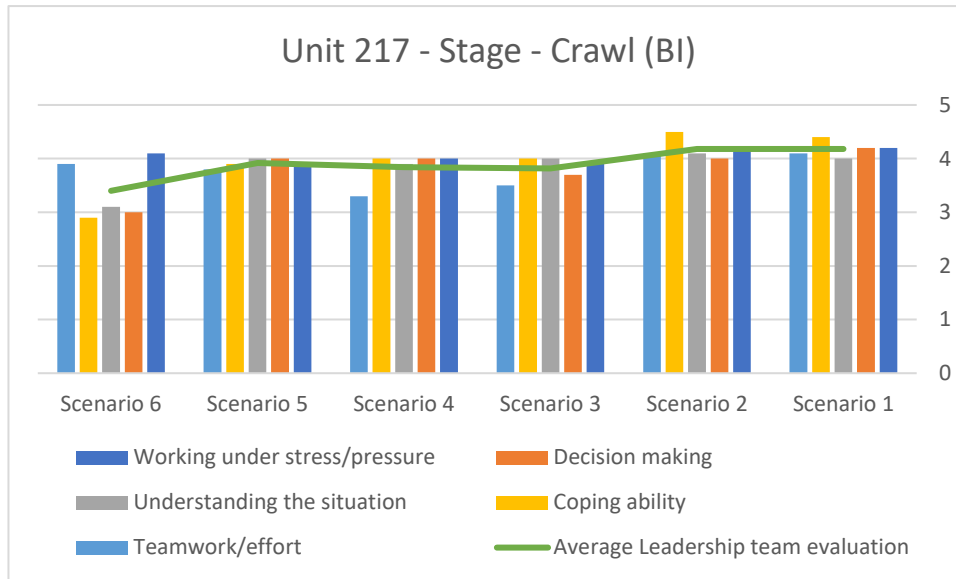
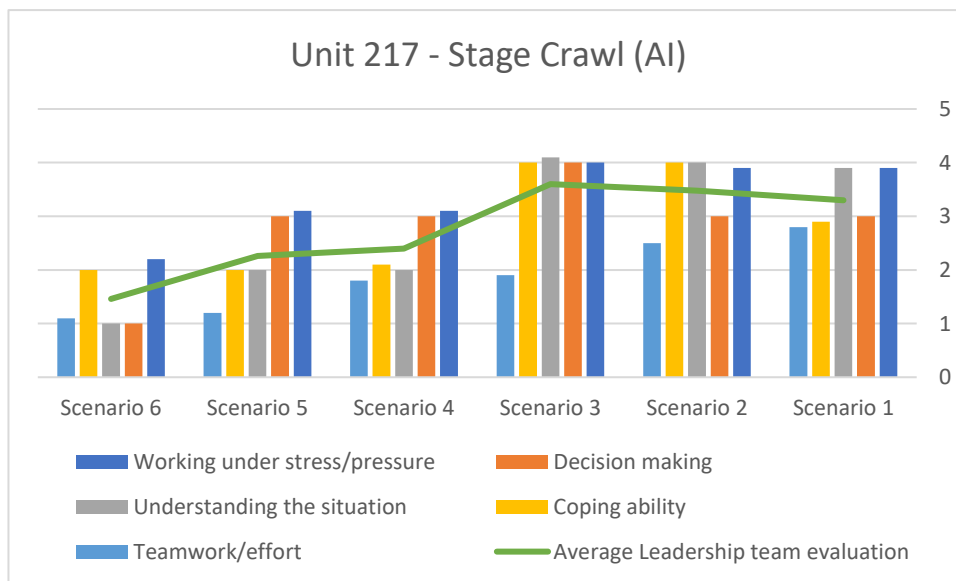


Figure No.20: Unit 217 (Duvdevan) – Stage: Crawl – Leadership team evaluation after intervention



Stage – Walk

Figure No.21: Unit 217 (Duvdevan) – Stage: Walk – Leadership team evaluation before intervention

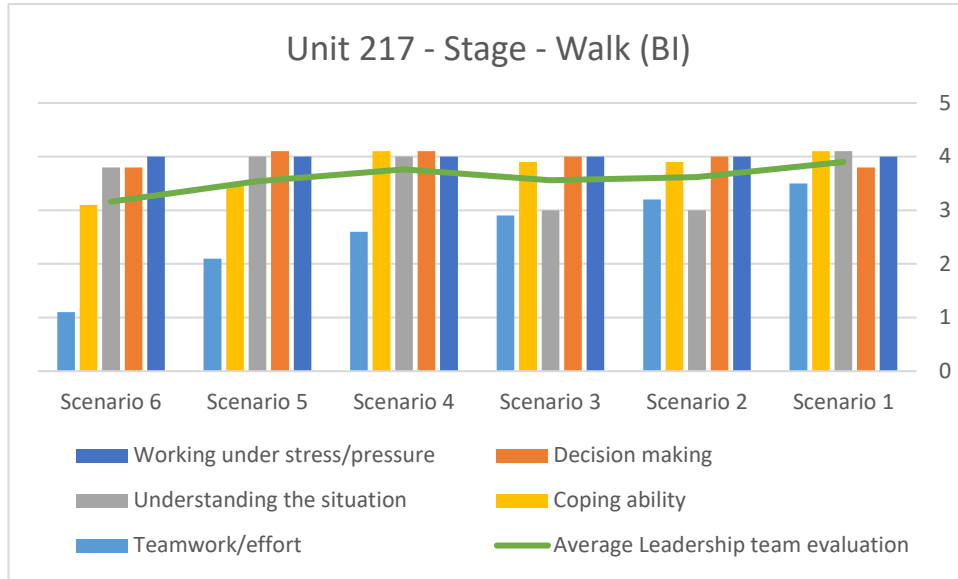
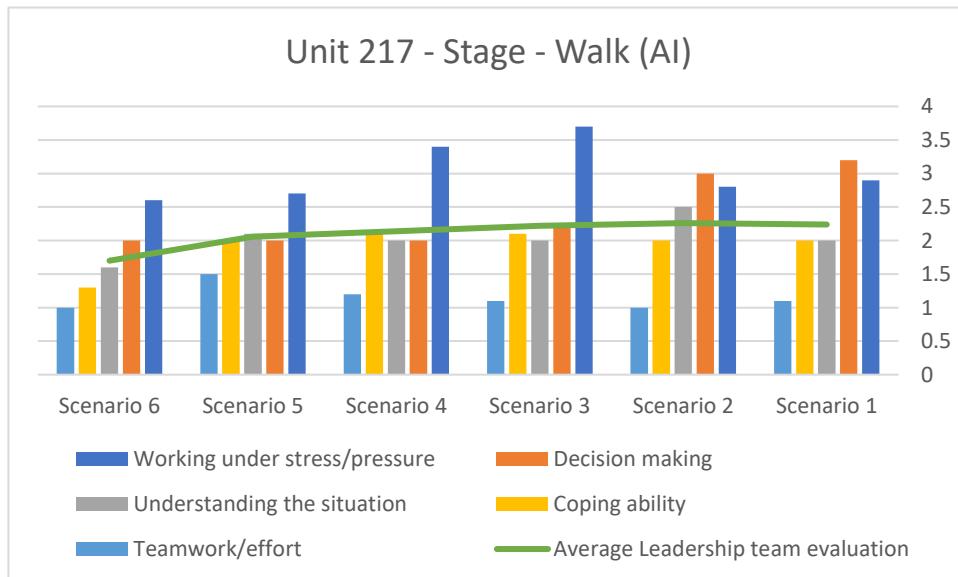


Figure No.22: Unit 217 (Duvdevan) – Stage: Walk – Leadership team evaluation after intervention



Stage – Run

Figure No.23: Unit 217 (Duvdevan) – Stage: Run – Leadership team evaluation before intervention

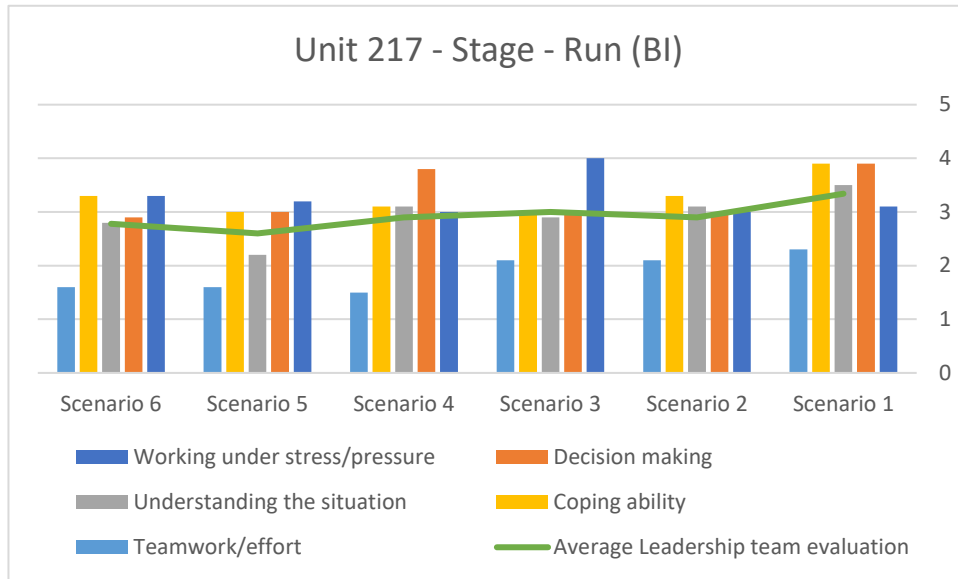
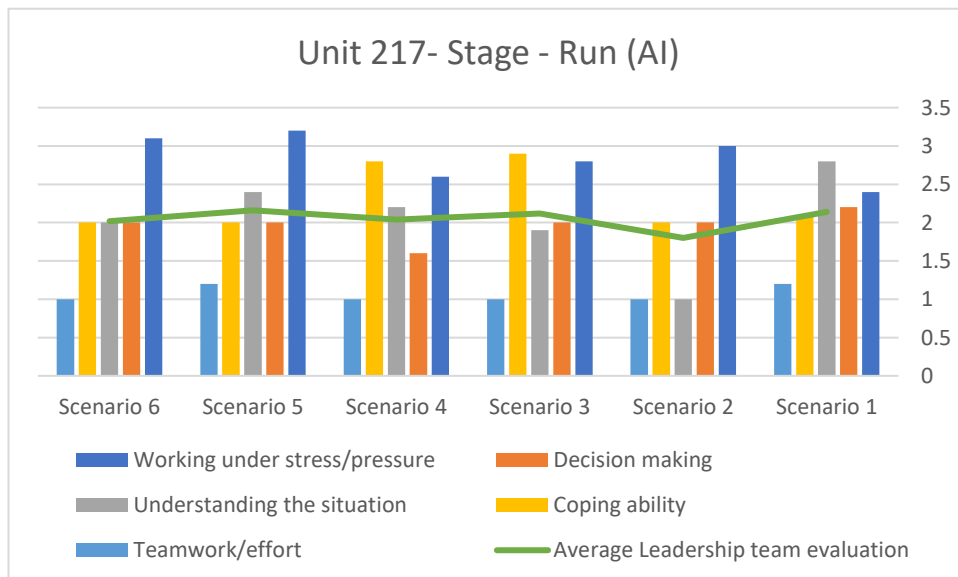


Figure No.24: Unit 217 (Duvdevan) – Stage: Run – Leadership team evaluation after intervention



YAMAS performance evaluation

Unit level assessment and evaluation

Stage – Crawl

Figure No.25: Unit YAMAS – Stage: Crawl – Evaluation before intervention

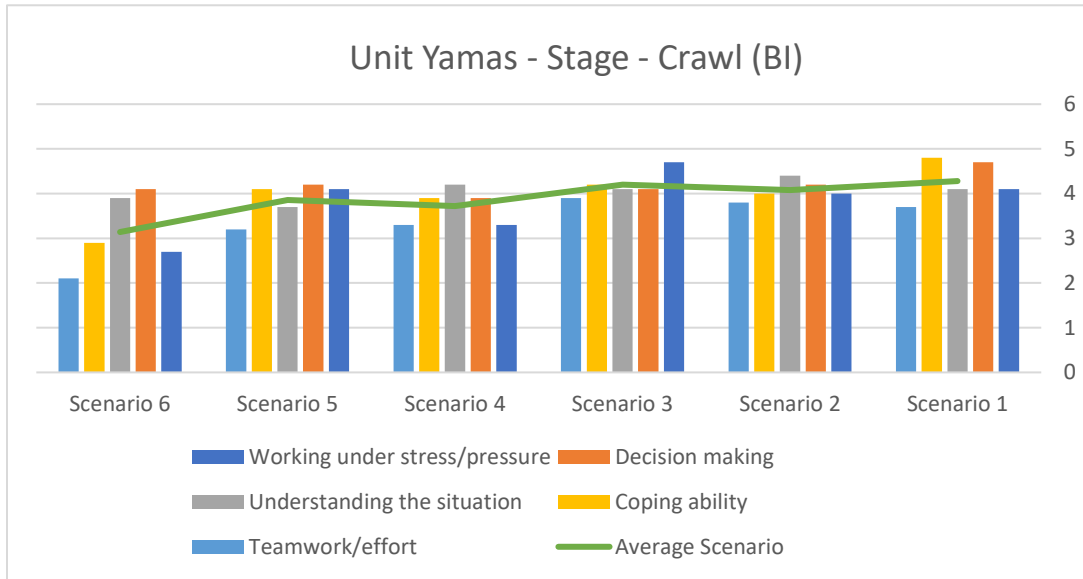
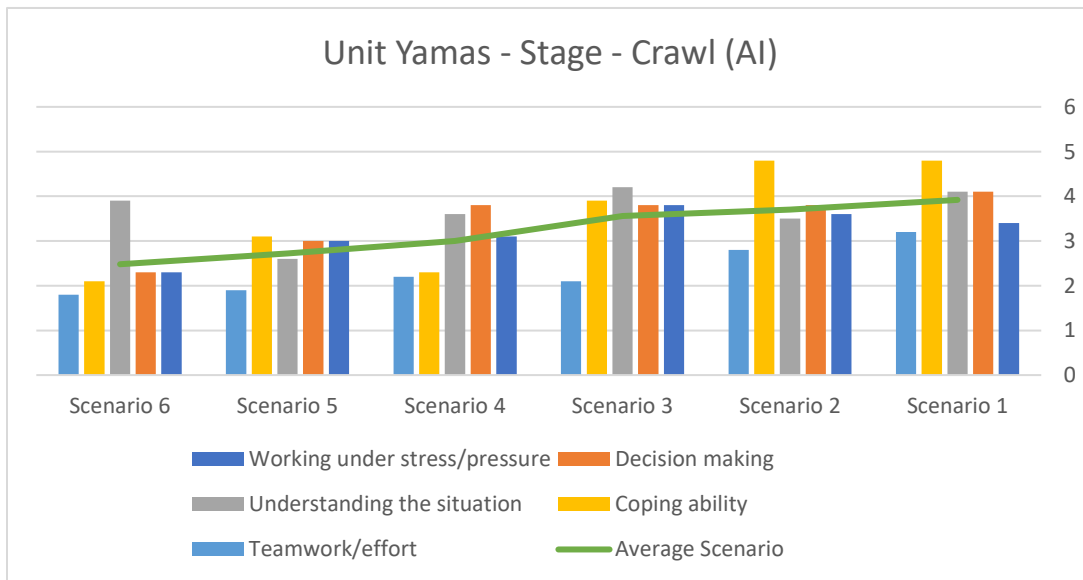


Figure No.26: Unit YAMAS – Stage: Crawl – Evaluation after intervention



Stage – Walk

Figure No.27 Unit YAMAS – Stage: Walk – Evaluation before intervention

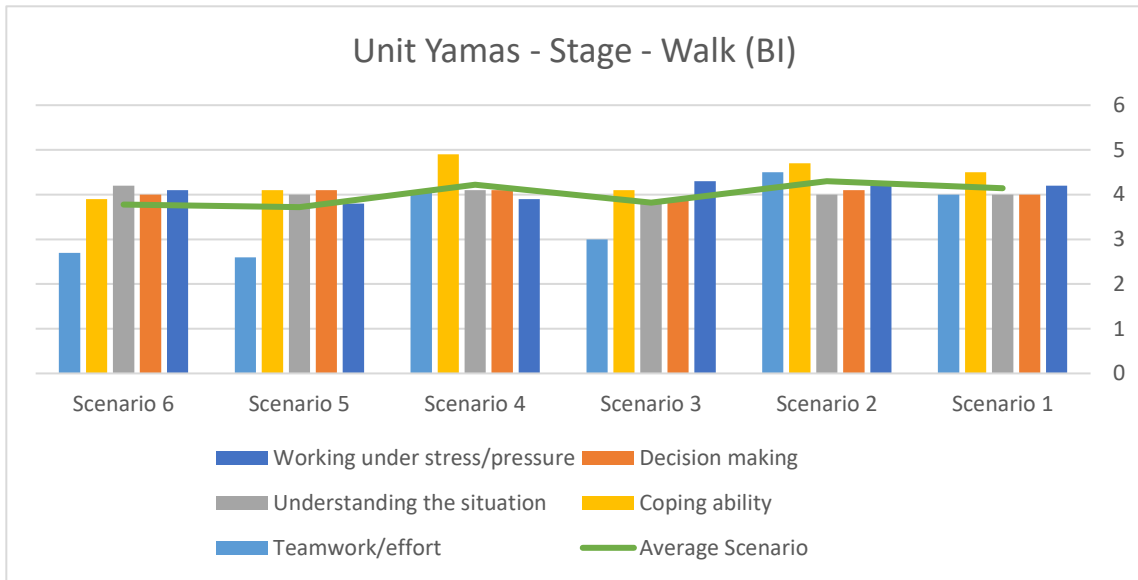
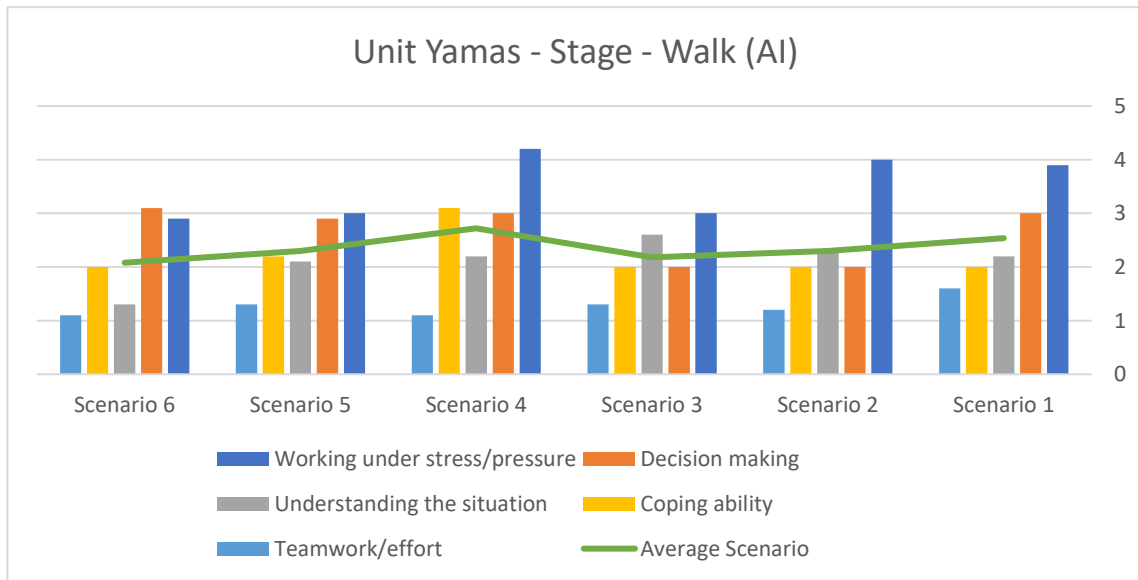


Figure No.28: Unit YAMAS – Stage: Walk – Evaluation after intervention



Stage – Run

Figure No.29: Unit YAMAS – Stage: Run – Evaluation before intervention

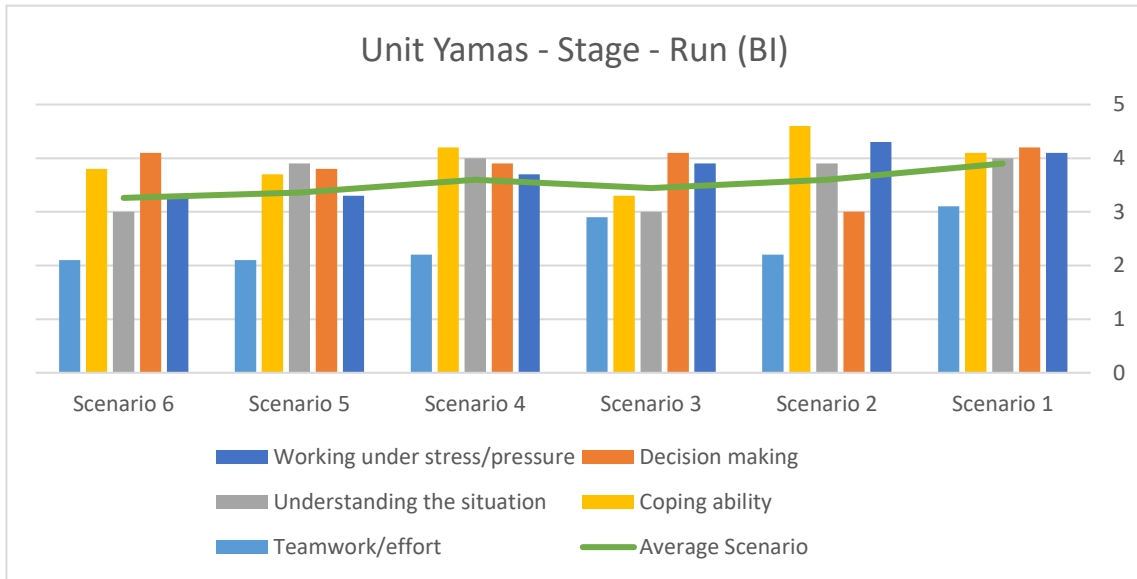
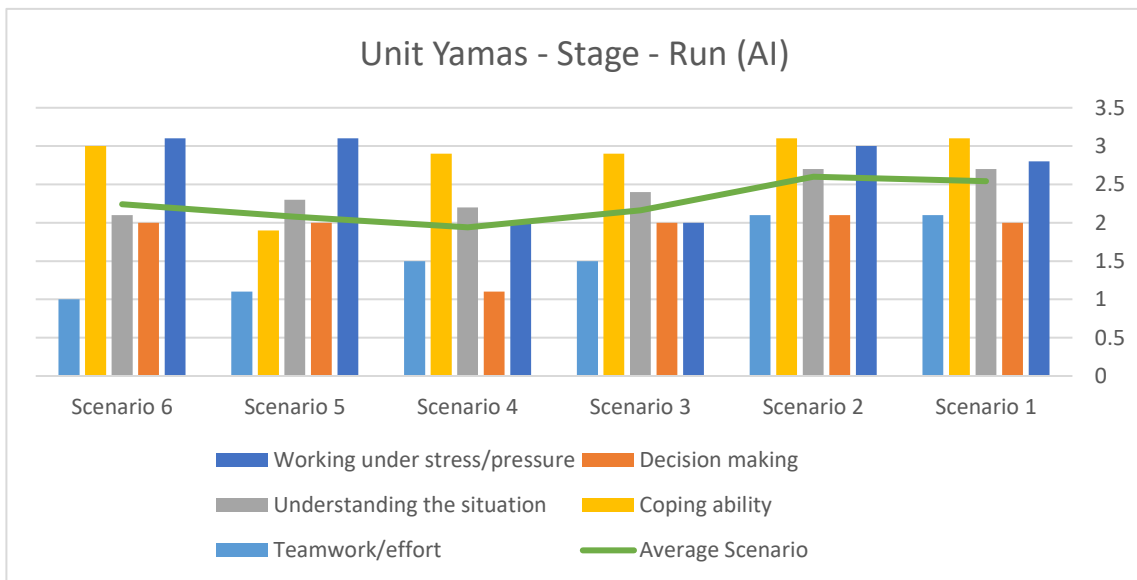


Figure No.30: Unit YAMAS – Stage: Run – Evaluation after intervention



Team leader level assessment and evaluation

Stage – Crawl

Figure No.31: Unit YAMAS – Stage: Crawl – Leadership team evaluation before intervention

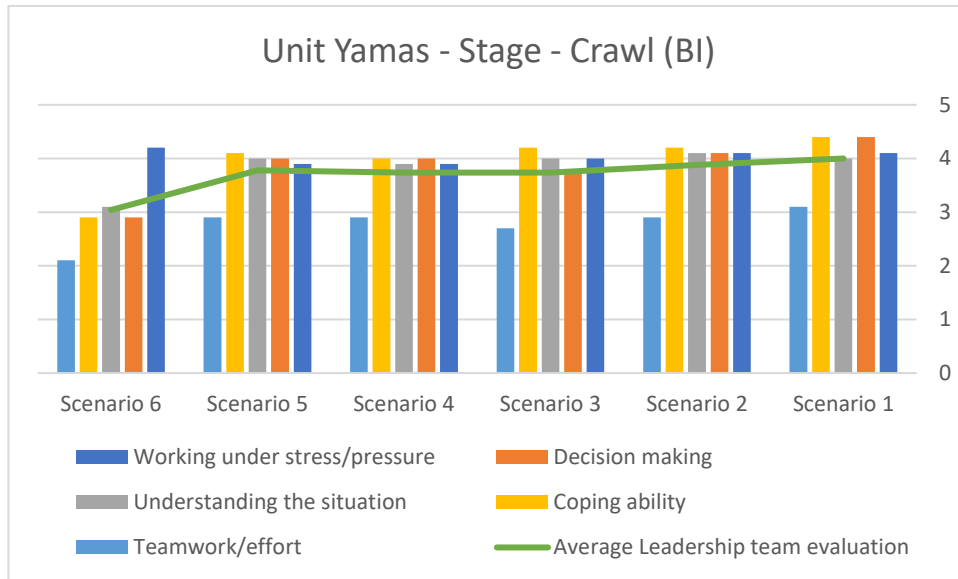
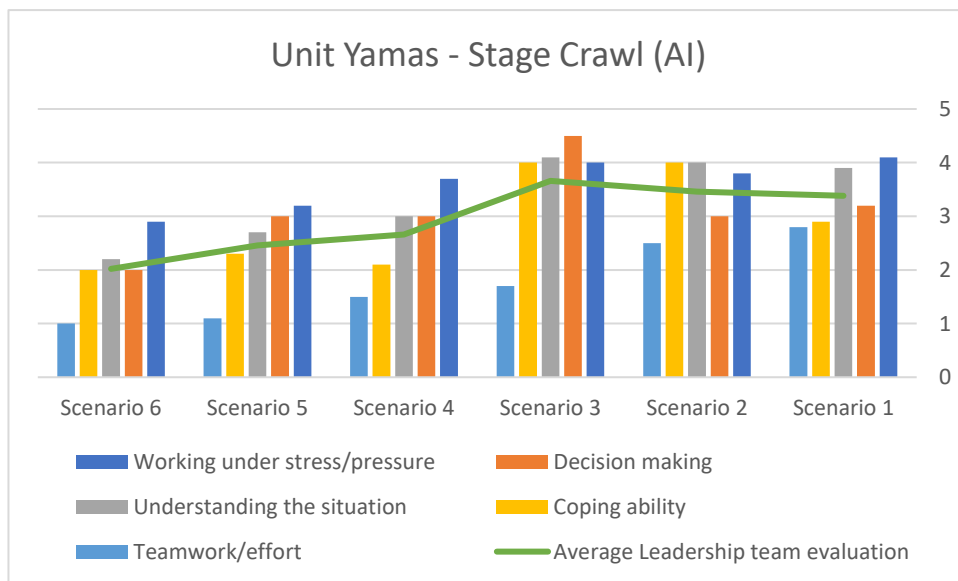


Figure No.32: Unit YAMAS – Stage: Crawl – Leadership team evaluation after intervention



Stage – Walk

Figure No.33: Unit YAMAS – Stage: Walk – Leadership team evaluation before intervention

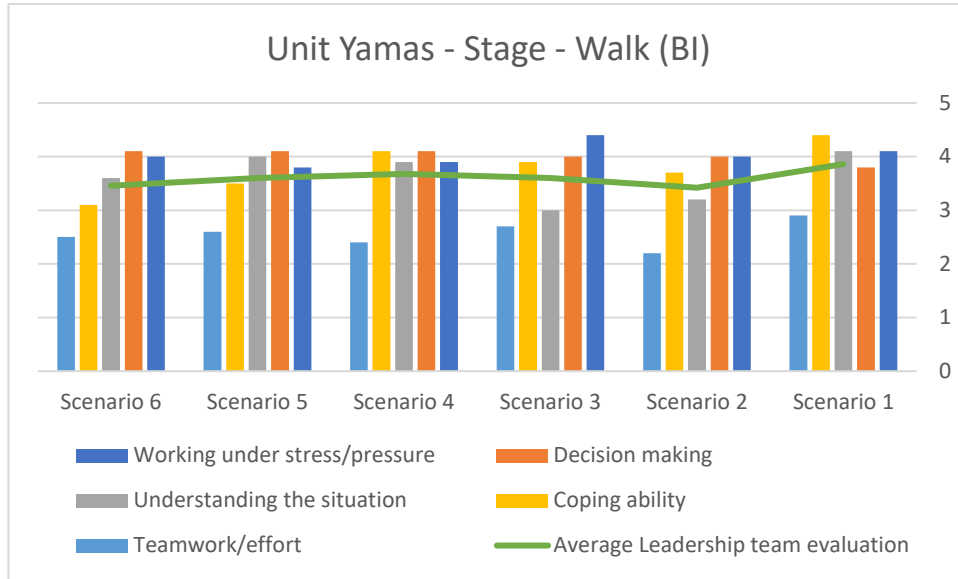
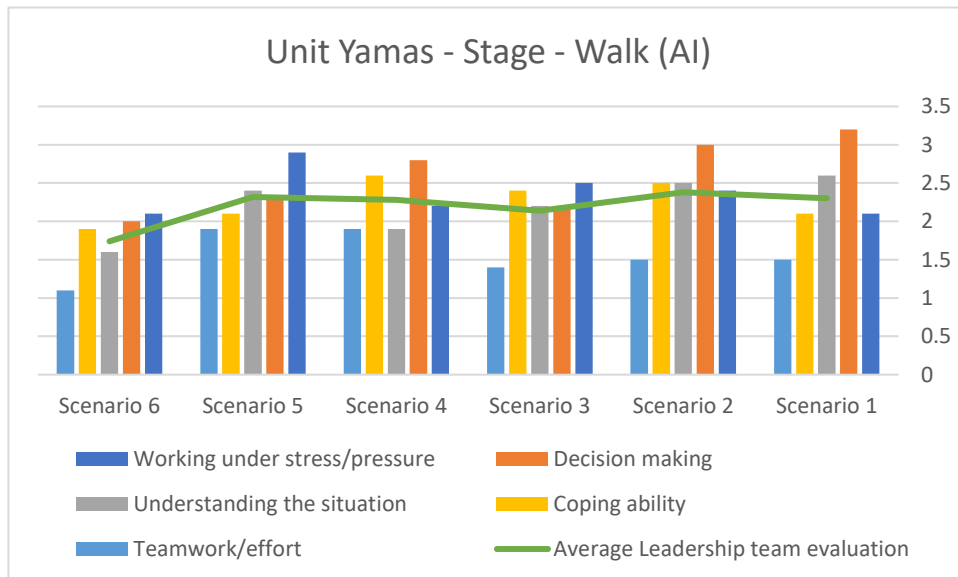


Figure No.34: Unit YAMAS – Stage: Walk – Leadership team evaluation after intervention



Stage – Run

Figure No.35: Unit YAMAS – Stage: Run – Leadership team evaluation before intervention

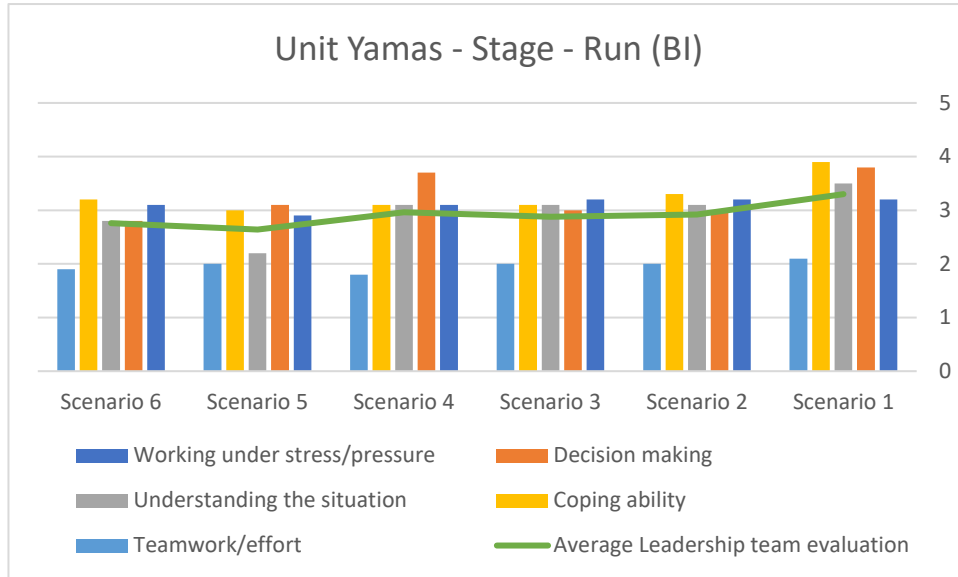
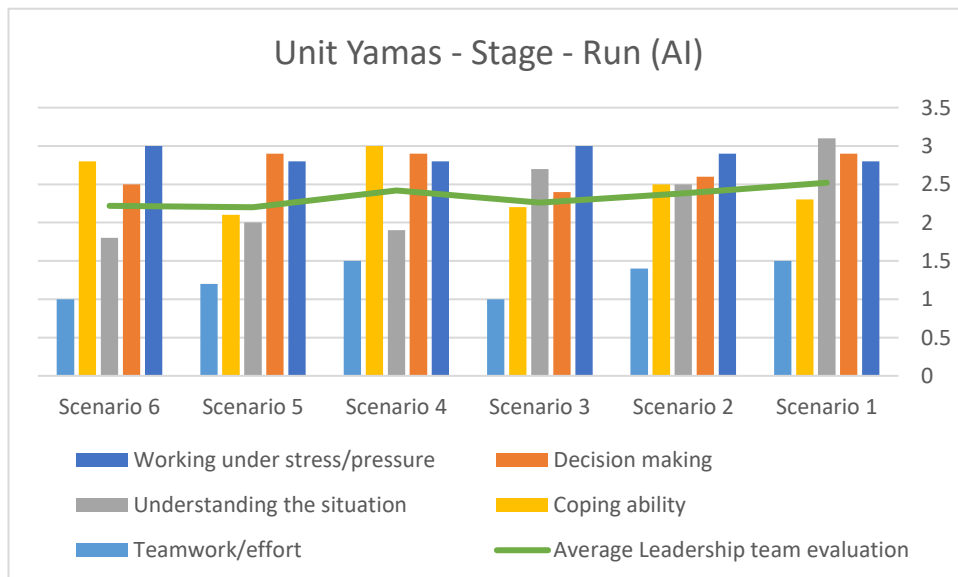


Figure No.36: Unit YAMAS – Stage: Run – Leadership team evaluation after intervention



Performance evaluation analysis

Team Performance

To examine the data, a multivariate analysis of variance was used, with one dependent variable and three independent variables. The analysis showed that all three factors (the type of unit, the stage and having an intervention plan) had a significant effect at a significance level of 1%, while the stage and intervention plan are also significant at a significance level of 0.1%.

The graphs below (Figures No.37 and No.38) are presented in two parts, the first part (graph no.1) shows the performance of each unit at each stage before an intervention program, and the second graph (Figure No.39) – presents the results after intervention. It should be emphasized that the lower the score, the better the performance.

Figure No.37- Estimated Marginal Means of Evaluation before intervention

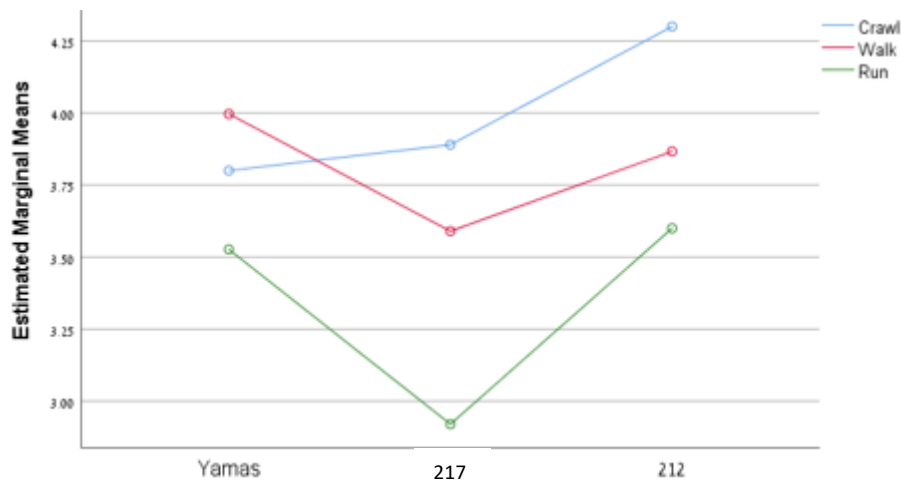
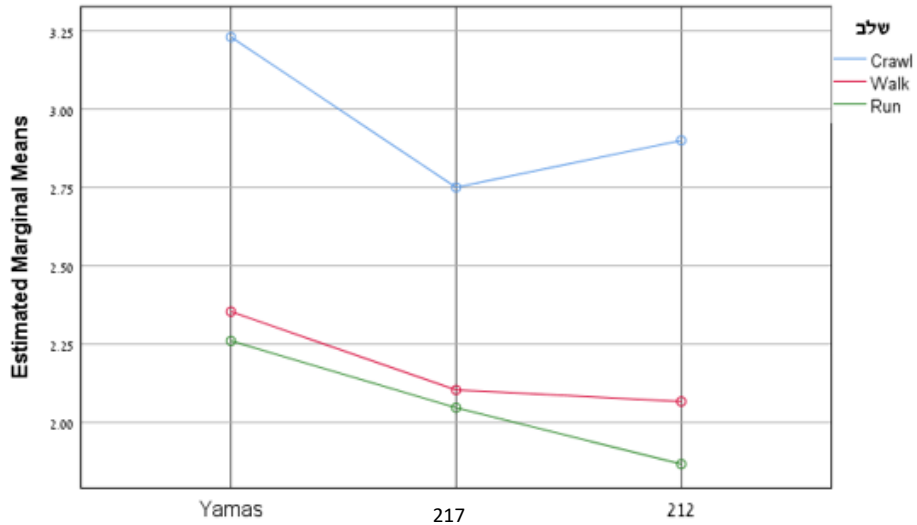


Figure No.38- Estimated Marginal Means of Evaluation after intervention



From Figure number 39 and 40 it can be learned that the implementation of the intervention program led to an improvement in the performance of the teams in all units. From the analysis of the findings, it appears, that the performance of all the units at the starting point before the intervention plan was activated is relatively high, while after the intervention plan, the starting point in all phases is better and indicates an effective implementation of the fighters.

Now, to examine the effect of the intervention program, graphs (Figure No.41 to no.43) relating to before and after intervention are presented for each phase for each unit. The results are shown below:

Figure No.39 - Estimated Marginal Means of Stage Crawl Evaluation before and after intervention

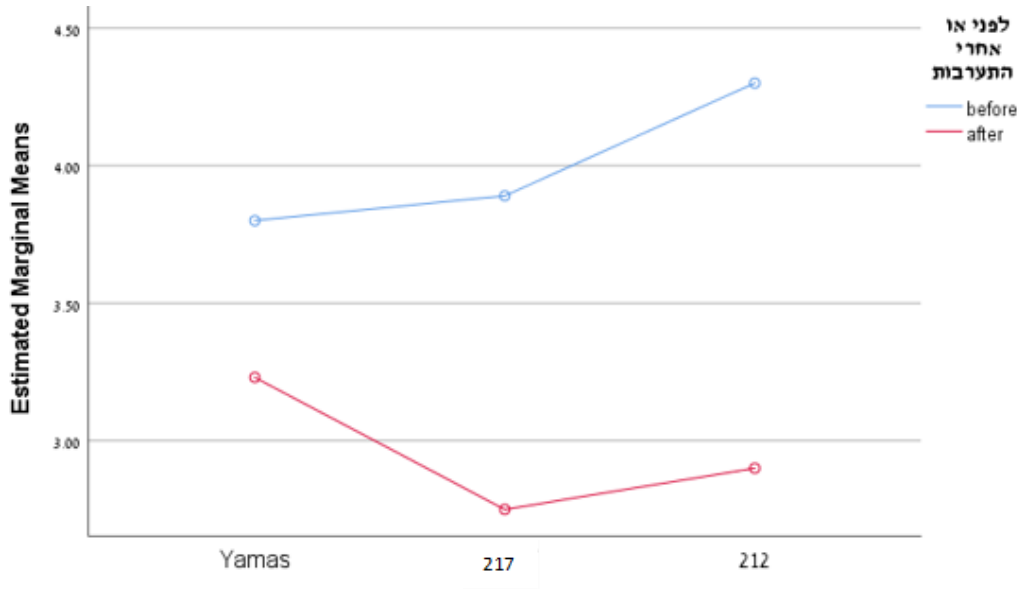


Figure No.40 - Estimated Marginal Means of Stage Walk Evaluation before and after intervention

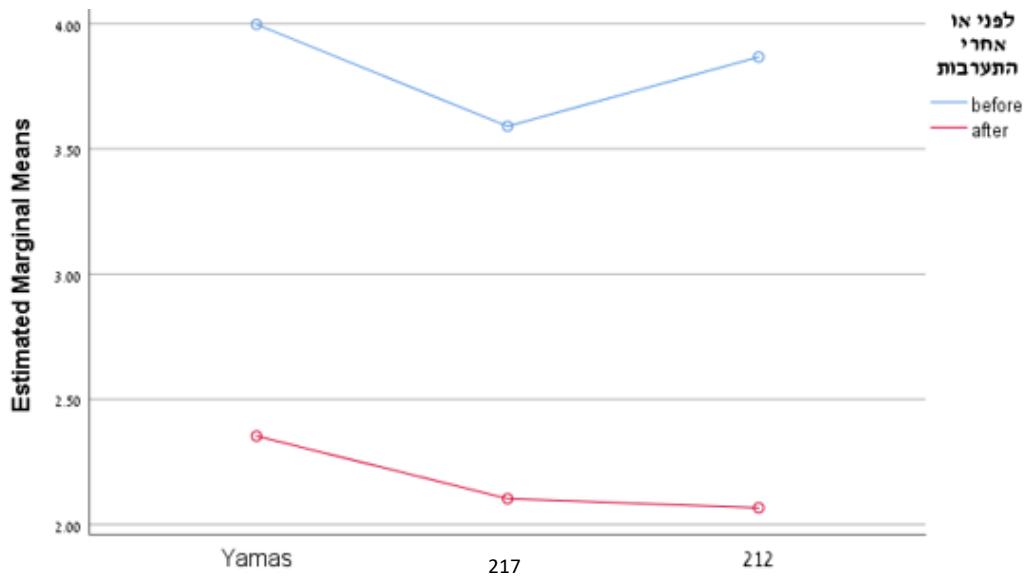
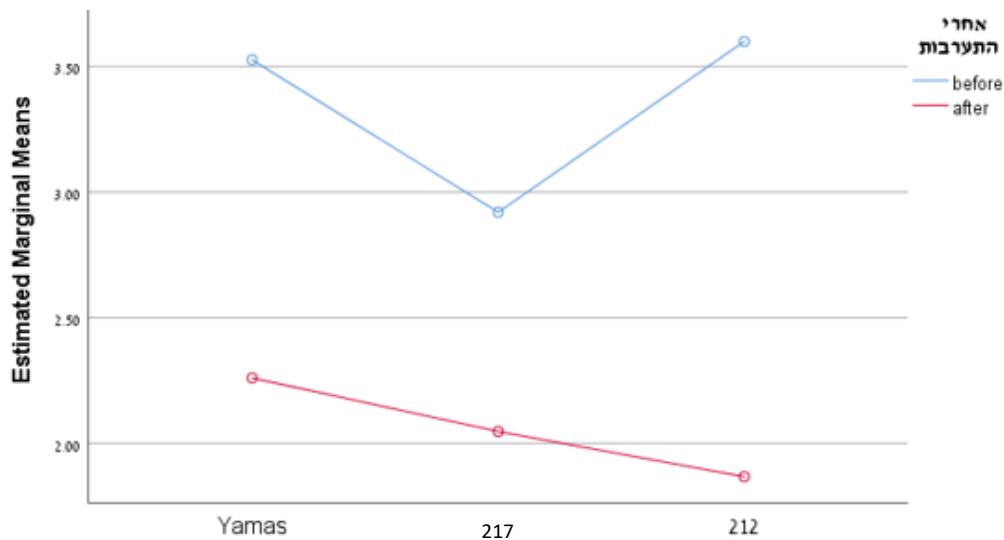


Figure No.41 - Estimated Marginal Means of Stage Walk Evaluation before and after intervention



From the analysis of the findings as shown in Figures No.41, No.42 and No.43, there is an improvement in all stages, crawl, walk and run after observing the intervention plan, where the improvement as shown by the findings is significant. Because, as mentioned, the lower the score, the better the performance, a positive effect of an intervention program is evident. Also as written above, it is distinct.

In the next step, we examined the effect of the interactions between all factors. A significant interaction was found between **unit** and **intervention program** (pvalue=0.016) and between **stage** and having an **intervention program** (pvalue=0.007). No significant interaction was found for unit and type (pvalue=0.7).

From the analysis of the findings as shown in table no.14, that without a doubt the intervention program affected the performance, when the performance rating decreased after the intervention program. It is evident that in different units and at different stages the decline was different, but it always existed.

In terms of comparison between units, a post hoc analysis was performed using Tukey's test. It was found, that the YAMAS performance was better than the Duvdevan (217) performance, except for this - it is not possible to point to a distinct difference between different units:

Table No. 14 - Multiple Comparisons

Dependent Variable: Performance

Tukey HSD

(I) Unit	(J) Unit	Mean Difference (I- J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Yamas	217	.3111*	.09421	.004	.0866	.5356
	212	.0944	.09421	.577	-.1301	.3189
217	Yamas	-.3111*	.09421	.004	-.5356	-.0866
	212	-.2167	.09421	.061	-.4412	.0078
212	Yamas	-.0944	.09421	.577	-.3189	.1301
	217	.2167	.09421	.061	-.0078	.4412

Based on observed means.

The error term is Mean Square(Error) = .160.

*. The mean difference is significant at the 0.05 level.

It is not possible to explain why one unit showed a higher improvement than another unit because the intervention plan implemented, and the scenarios practiced by the units were the same, but it can be assumed that there are units that were able to implement the intervention tools in a better way.

Leader Performance

To evaluate the performance of the census, a multivariate analysis of variance was performed in a similar manner. It was found that in this case as well, the unit, phase and mixture factors were found to be significant at a significance level of 1%. An interaction between stage and intervention program was also found to be significant.

Therefore, it can be concluded that the intervention program had a positive effect on each unit, but its effect was the greatest on 212 and the least on YAMAS.

Table No. 15 - Tests of Between-Subjects Effects

Dependent Variable: Performance

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	52.521 ^a	17	3.796	23.761	.000
Intercept	810.739	1	1010.779	6327.271	.000
Unit	1.423	2	.716	5.734	.003
Stage	8.054	2	6.513	34.512	.000
Before or after	47.309	1	47.309	296.146	.000
Unit * Stage	.470	4	.087	.548	.890
Unit * Before or After	1.239	2	.695	4.347	.016
Stage * Before or After	1.671	2	.835	5.229	.007
Unit * Stage * Before or After	.952	4	.238	1.489	.212
Error	14.377	90	.160		
Total	1089.686	108			
Corrected Total	78.906	107			

From the analysis of the findings as shown in Table No. 15, it appears that the implementation of the intervention program had a positive effect on the perception of the performance of the force commander who led the unit. The results obtained regarding unit 212, which indicated a large jump in the commanders' perception of the performance of the intervention plan, can be explained by the fact that the soldiers' perception of trust in the commanders beforehand was lower, and therefore the implementation of the intervention plan significantly improved their perception of the commanders who performed better for the unit and managed the scenarios better.

Discussion

The purpose of the present study was to examine the effect of the CWR model developed by the researcher. As part of the research, the performance of several special units was examined before and after the model was tested. Through different scenarios, it was possible to examine the way in which the fighters and team commanders react to the threats they had to deal with. The development of the CWR model is intended to improve the performance of the combat fighters, to expose them to a wide variety of operational attribution scenarios and indeed in a way that will reduce the chance that they will later suffer post-trauma (PTSD).

Vast studies (Benedek, Hamaoka & West, 2017) that have been conducted over the years examined the Combat and Operational Stress Reaction (COSR) of combatants as a result of complex combat activity, and it was found to be related to acute stress disorder (ASD) and post-traumatic stress disorder (PTSD). Clinical signs and symptoms of COSR can present in four domains: physiologic, mental, emotional, and behavioral. Other studies (Solomon and Kleinhauz, 1996) examining the long-term effects of war have indicated high levels of post-traumatic stress disorder (PTSD) among combatants, even many years after the war has ended. Data shows that approximately 25-30 percent of direct and indirect combat-exposed infantry units suffers from PTSD (Hoge et. al., 2004). For special operations forces (SOF), data shows that between 2 percent to 20 percent meeting score thresholds for PTSD, depending on the unit or the criteria measuring the symptoms (Hing et al., 2012).

The treatment of combatants who were exposed during combat to traumatic events that led to post-trauma begins in most cases long after the war ends and the combatants return home (Hamaoka, Benedek, & West, 2017). Even soldiers who complete the operational activity and return to the units are required to deal with traumatic events and in many cases also with post-trauma. In this case, the treatment should of course be carried out

individually and within the framework of the military or civilian mental health system (Department of the Army, 2009).

One of the accepted coping approaches of people with extreme stress situations is through an avoidance strategy. That is, the individual takes care to avoid the complex situation that may leave him with trauma and later even with post-trauma (Foa, Huppert and Cahill, 2006). As it appears from the current research, the way to deal with complex scenarios, especially when it comes to the operational activity of a special unit or combat units, is not to avoid the scenario, but rather to deal directly with the scenario, which makes it possible to build the mental resilience required to deal with similar or other scenarios in the future.

One of the main effects in dealing with an extreme scenario such as a battle is tonic immobility (TI). TI was found in earlier research as passive behavior characterized by reversible motor inhibition that lasts from a few seconds to several hours, suppressed vocalization, fixed, and focused stare (Marx et al., 2008; Bovin, Ratchford, and Marx, 2014). In a battle, during an armed engagement or an encounter with hostile elements, combatants, even when its soldiers who belong to army special forces and anti-terror squads, may find themselves under pressure and distress which is expressed, among other, in tonic immobility. TI was found as a pre-eminent peritraumatic risk factor for subsequent PTSD symptomatology (Bovin et al. 2008; Humphreys, Saunder, Martin, and Marx, 2010; Lima et al., 2010; Rocha-Rego et al., 2009). Research (Bados, Garcia-Grau and Fusté, 2015) has showed, that the progression through the defense cascade has been shown to be modifiable which means, that the individual's perception of how traumatic the event was and the presence of intense fear, sense of inescapability are significant predictors of TI, which highlights the importance of a person's initial reaction to trauma. In other words, it is possible to create or build a defense system for fighters even before they are exposed to a complex combat event or to extreme combat scenarios in order to prevent the TI and subsequently also PTSD.

When combatants are exposed to a life-threatening event, they may experience substantial difficulty in operational functioning, whether as combatants or commanders. PTD in this context, may appear through various symptoms which can later result from symptoms of PTSD (Bramsen et al., 2000; Maia et al., 2011). Research (Maia et al., 2011) showed, that police officers with higher negativity showed a prolongation of heightened arousal that would elicit and maintain early dissociation like PTD, interfering with fear encoding and proper stimuli processing and leading to higher scores of PTSD symptoms. As soon as they can control the events, the negative feelings and the symptoms that characterize PDT can be reduced, as well as reacting better to the scenarios, i.e. the operational tasks, and it is also possible to prevent or reduce the extent of the vulnerability that will lead to PTSD. In the current research, the intervention plan, which was built as mentioned in stages, was able to improve the LOC of the fighters and thus actually reduce the risk of suffering from PTSD in the future. This finding is consistent with the findings in the research literature when it was found that among Israeli soldiers who fought in the Lebanon War, low LOC was found to be associated with PTSD (Karstoft et al., 2015).

Studies have identified further combat exposure experiences that are PTSD risk-factors: threat of personal harm (Kolkow et al., 2007; Peterson et al., 2023; Phillips et al., 2010); witnessing someone from one's unit or ally unit being seriously wounded or killed (Pietrzak et al., 2011), and experiencing "friendly" fire (Pietrzak et al., 2011). From the current study, it appears that in the first stages of the practice, scenarios in the stages of crawling, walking and running before the activation of the intervention program, resulted in the low performance of the practiced teams, as well as the way in which the performance of the commanders was evaluated. However, when the intervention program was implemented, performance in all scenarios improved significantly. That is, it can be concluded that the right intervention can reduce the symptoms that may lead to PTSD. Practicing scenarios of the death of a fighter, abduction, or incorrect decision-making, does cause demoralization among the fighters, but after the implementation of the intervention

program, the performance in those scenarios brings the team to a substantial improvement and the completion of the mission in an optimal way. Along with completing the mission, the warriors themselves build the required resilience with which they will be able to cope better on the battlefield and avoid as much as possible the development of PTSD symptoms.

War-zone stressor exposure has been considerably highlighted as a determining factor towards PTSD formation (Sutker et al., 1995) therefore, it is crucial to promote the usage of coping strategies. Coping styles are significant factor when we look closer at the results in the current research. The results demonstrate the importance of coping strategies that can prevent the chance of getting PTSD after exposure to an extreme combat scenario. Problem-focused strategy (Lazarus and Folkman, 1984) and Emotion-focused coping styles, especially avoidance coping was found as associated with higher levels of PTSD (Brousse et al., 2011; Bryant and Harvey, 1995; Chang et al., 2003; Ménard and Arter, 2014; Mikulincer and Solomon, 1989). Furthermore, avoidant coping strategy can also expose the combatants to acute stress and to develop symptoms of PTSD (Maia et al., 2011).

Protective factors against PTSD development other than coping styles and perception during combat have not been significantly highlighted. The current results reflect the importance of adopting coping style that can fit special forces training programs. The intervention model CWR that was used, provide the participants the right tool that abled them not just to improve their combat abilities, but purchase the needed resilience and mental strength to handle the acute combat scenarios.

Conclusions

The main objective of the present study was to examine the effect of the CWR model, that was developed after over 25 years of operational experience in special forces combat, and enhance their personal resilience, to reduce the Reduce the risk of PTSD.

Many combatants, both in combat military settings, both in special forces and in anti-terrorist units, face extreme scenarios as part of their service, with some of them suffering from PTSD during or after the end of the service. The current study was able to show that the implementation of an intervention program within the training program of the units, managed to improve the performance of the units and the commanders, but also contributed to building the resilience of the fighters.

Resilience is an important and central part for any fighter's capabilities, especially when he is required to operate with complex combat scenarios. Building the resilience throughout the intervention model (CWR), helped the units to react and respond optimally with the different and complex scenarios, and to help the commanders to make better decisions when carrying out the missions.

The main conclusion, as emerges from the results of the present study, is that in order to reduce the likelihood of the combat soldiers suffering from PTSD, during or after their military and operational service, it is necessary to improve their resilience in a way that will allow them to better deal with extreme warfare events. It is necessary to provide the units a solid well-design training programs as part of their service. The CWR model can be modified to any other military, police and antiterror units, and able to integrate as part of the training routine.

Limitation

There can be identified several major limitations to the present study can be pointed out. First, the current study is not a clinical study that examines the long-term effects of running the intervention program, meaning, we did not clinically examine the participants resilience before and after the model intervention and whether they might be exposed to the symptom's characteristic of PTSD.

It should also be considered that the characteristics of each unit are different and may affect the results. For example, a unit such as YAMAM is occupied by older antiterror combat fighters whose ability to cope with the complexity and uncertainty of the battlefield is higher, while an elite unit like 212 is occupied by younger soldiers, some may be at age 18 and 19 years old, which act and react differently in the battlefield.

Suggestions for further research

It is necessary to further investigate the ability of the intervention model by adding a clinical research design that can provide evidence of the growth of resilience in the combatants. The research should focus on their personal resilience before and after the intervention during full training program. It can demonstrate the effectiveness of the CWR model, not just by improve their professional abilities, but prevent PTSD.

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Appendix

Appendix A - Diagnostic criteria for ASD according to the DSM-IV

DSM-IV	DSM-5
Disorder Class: Anxiety Disorders	Disorder Class: Trauma- and Stressor-Related Disorders
<p>A. The person has been exposed to a traumatic event in which both of the following were present:</p> <ol style="list-style-type: none"> 1. The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others. 2. The person's response involved intense fear, helplessness, or horror. 	<p>A. Exposure to actual or threatened death, serious injury, or sexual violation in one (or more) of the following ways:</p> <p>Directly experiencing the traumatic event(s).</p> <p>Witnessing, in person, the event(s) as it occurred to others.</p> <p>Learning that the event(s) occurred to a close family member or close friend.</p> <p>Note: In cases of actual or threatened death of a family member or friend, the event(s) must have been violent or accidental.</p> <p>Experiencing repeated or extreme exposure to aversive details of the traumatic event(s) (e.g., first responders collecting human remains, police officers repeatedly exposed to details of child abuse).</p> <p>Note: This does not apply to exposure through electronic media, television, movies, or pictures, unless this exposure is work related.</p>
<p>B. Either while experiencing or after experiencing the distressing event, the individual has three or more of the following dissociative symptoms:</p> <ol style="list-style-type: none"> 1. a subjective sense of numbing, detachment, or absence of emotional responsiveness 2. a reduction in awareness of his or her surroundings 3. derealization 4. depersonalization 5. dissociative amnesia (i.e., inability to recall an important aspect of the trauma) <p>C. The traumatic event is persistently re-experienced in at least one of the following ways: recurrent images, thoughts, dreams, illusions, flashback episodes, or a sense of reliving the experience; or distress on exposure to reminders of the traumatic event.</p> <p>D. Marked avoidance of stimuli that arouse recollections of the trauma (e.g.,</p>	<p>B. Presence of nine or more of the following symptoms from any of the five categories of intrusion, negative mood, dissociation, avoidance, and arousal, beginning or worsening after the traumatic event(s) occurred:</p> <p>Intrusion Symptoms</p> <ol style="list-style-type: none"> 1. Recurrent, involuntary, and intrusive distressing memories of the traumatic event(s). Note: In children, repetitive play may occur in which themes or aspects of the traumatic event(s) occurred. 2. Recurrent distressing dreams in which the content and/or effect of the dream are related to the event(s). Note: In children, there may be frightening dreams without recognizable content. 3. Dissociative reactions (e.g., flashbacks) in which the individual feels or acts as if the traumatic

<p>thoughts, feelings, conversations, activities, places, people). E. Marked symptoms of anxiety or increased arousal (e.g., difficulty sleeping, irritability, poor concentration, hypervigilance, exaggerated startle response, motor restlessness).</p>	<p>event(s) were recurring. (Such reactions may occur on a continuum, with the most extreme expression being a complete loss of awareness of present surroundings.) Note: In children, trauma-specific reenactment may occur in play.</p> <p>4. Intense or prolonged psychological distress or marked physiological reactions in response to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).</p> <p>Negative Mood 5. Persistent inability to experience positive emotions (e.g., inability to experience happiness, satisfaction, or loving feelings).</p> <p>Dissociative Symptoms 6. An altered sense of the reality of one's surroundings or oneself (e.g., seeing oneself from another's perspective, being in a daze, time slowing). 7. Inability to remember an important aspect of the traumatic event(s) (typically due to dissociative amnesia and not to other factors such as head injury, alcohol, or drugs).</p> <p>Avoidance Symptoms 8. Efforts to avoid distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s). 9. Efforts to avoid external reminders (people, places, conversations, activities, objects, situations) that arouse distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).</p> <p>Arousal Symptoms 10. Sleep disturbance (e.g., difficulty falling or staying asleep, restless sleep). 11. Irritable behavior and angry outbursts (with little or no provocation), typically expressed as verbal or physical aggression toward people or objects. 12. Hypervigilance. 13. Problems with concentration. 14. Exaggerated startle response.</p>
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F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning or impairs the individual's ability to pursue some necessary task such as obtaining necessary assistance or mobilizing personal resources by telling family members about the traumatic experience.	D. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
G. The disturbance lasts for a minimum of 2 days and a maximum of 4 weeks and occurs within 4 weeks of the traumatic event.	C. Duration of the disturbance (symptoms in Criterion B) is 3 days to 1 month after trauma exposure.
	Note: Symptoms typically begin immediately after the trauma, but persistence for at least 3 days and up to a month is needed to meet disorder criteria.
H. The disturbance is not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition, is not better accounted for by brief psychotic disorder, and is not merely an exacerbation of a preexisting Axis I or Axis II disorder.	E. The disturbance is not attributable to the physiological effects of a substance (e.g., medication or alcohol) or another medical condition (e.g., mild traumatic brain injury) and is not better explained by brief psychotic disorder.

Appendix B - DSM-IV-TR Criteria for Posttraumatic Stress Disorder

A. The person has been exposed to a traumatic event in which both of the following were present:

(1)The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others.

(2)The person's response involved intense fear, helplessness, or horror. Note: In children, this may be expressed instead by disorganized or agitated behavior.

B. The traumatic event is persistently reexperienced in one (or more) of the following ways:

(3)Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. Note: In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.

(4)Recurrent distressing dreams of the event. Note: In children, there may be frightening dreams without recognizable content.

(5)Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience; illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated). Note: In young children, trauma-specific reenactment may occur.

(6)Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

(7)Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:

(8)Efforts to avoid thoughts, feelings, or conversations associated with the trauma

(9)Efforts to avoid activities, places, or people that arouse recollections of the trauma

(10)Inability to recall an important aspect of the trauma

(11)Markedly diminished interest or participation in significant activities

(12)Feeling of detachment or estrangement from others

(13)Restricted range of affect (e.g., unable to have loving feelings)

(14)Sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal lifespan)

D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:

(1)Difficulty falling or staying asleep

(2)Irritability or outbursts of anger

(3)Difficulty concentrating

(4)Hypervigilance

(5)Exaggerated startle response

E. Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.

F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.