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Self-efficacy and state anxiety during mandatory combatives training

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Summary

Background: The new U.S. Army combatives program has been implemented to provide soldiers with the physical and psychological demands of hand-to-hand fighting prior to engaging in combat. The purpose of this study was to describe changes in self-defense efficacy, self-efficacy for teaching combatives, and levels of competitive state anxiety during of a one-week US Army combatives instructor level-one instructor certification program training course.

Material/Methods: his pilot study evaluated the levels of self-defence efficacy (SDE), teaching combatives self-efficacy (TCSE), and state combatives anxiety (SCA) among U.S. Army soldiers (n=25) attending an instructor combatives training course.

Results: Repeated Measures ANOVA revealed a significant increase in SDE and TCSE across the course. Individuals with higher levels of SCA scored lower in SDE than those with lower SCA scores at all measurement points.

Conclusions: Individuals ordered to attend training scored lower in SDE, TCSE, and higher in state anxiety than those who volunteered for the training. These results provide preliminary, descriptive evidence that combatives self-efficacy can be increased by participation in this course.

Key words: **hand-to-hand fighting • self-defence efficacy • state combatives anxiety • teaching self-efficacy**

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BACKGROUND

In a *Memorandum for Record* (2004), the Chief of Staff of the Army characterized the objectives of the Army Combatives Program as follows: The intent is for every soldier to experience *the physical and emotional demands* of hand-to-hand fighting prior to engaging in combat. Combatives training is an important component of the warrior ethos. The purpose of combatives training is to *instill confidence and fighting skill* that can only be gained through engagement with an opponent in a combative situation. Hand-to-hand combat training is a fundamental building block for preparing our soldiers for current and future operations. Soldiers must be prepared to use different levels of physical force across the operational spectrum in an uncertain environment. Combatives training will provide this critical capability (p. 1).

To fulfill the mandate of this program, a new Army combatives program has been established. It is composed of four levels of certification for instructors, but every soldier is required to be proficient in combatives skills from all ranges of the certification. Certified instructors are responsible for the training of the soldiers at the unit level. Level one provides certification for the initial entry instructor, and provides the foundation for the program. At this level, the program focuses on grappling situations and skills that include dominant positions, choking, and joint locking techniques. The level one instructor certification course is 40 hours in length, and it lasts one week at a combatives facility. Soldiers training to become instructors are required to perform the acquired skills by participating in fighting situations with their classmates on a daily basis, and an evaluated event at the end of the week. This program is different from other martial arts training regimens across the spectrum because students are required to engage in a hand-to-hand combat situation on a daily basis during the course. Unlike other martial arts instructional programs in the U.S, participants get to find out if their technique is effective every time they enter the training environment.

In addition to developing physical capability in fighting skills, the explicit intent for the Army Combatives Program is to instill confidence, and equip soldiers to better deal with the emotional demands of combat. Conceptually, self-efficacy and anxiety relative to hand-to-hand combative engagement are the psychological constructs relevant for consideration.

Self-efficacy is a psychological belief about one's capabilities to achieve designated levels of performing a specific task [1–3]. High levels of self-efficacy have been related to high levels of motivation, performance of more challenging tasks, setting of higher goals, and perseverance in reaching those goals [3–8]. Self-efficacy provides the bridge from the physical to representations of the physical within the mind of the person [9]. In this training environment, the task relates to a belief that one can apply and teach the combatives techniques presented during the level one course. A lack of confidence to perform this task could result in lower levels of motivation to continue with the program. Moreover, individuals lacking motivation to participate may not become efficient instructors after training. Therefore, a low level of combatives self-efficacy could lead to the implementation of an ineffective unit level training program which, in turn,

might ultimately impact upon the combat readiness of individual soldiers.

Theoretically, self-efficacy cognitions are based upon input from four specific information sources: performance accomplishment, vicarious experiences, verbal persuasion, and emotional arousal [1–3,10]. In this study, *performance accomplishment* information available to participants includes their previous enactive mastery experiences in martial arts activity. These experiences should have an impact on both *self-defense efficacy* and *teaching self-efficacy*. Previous combative experience may also provide efficacy information through the *vicarious experience* of seeing successful mastery enactments by other martial arts participants. The third source of efficacy information, *verbal persuasion*, has less impact than experience, but for the participants of this study, encouragement from their supervisors can also be an influencing factor on their self-efficacy beliefs. This verbal persuasion could be even more apparent if the participants have had previous combatives training experience, and have demonstrated high-performance in other areas of the physical domain. Lastly, Bandura suggested that perceptions of *emotional arousal* can affect efficacy expectations. These perceptions of arousal are a result of the cognitive appraisal individuals go through before each potentially stressful event. Other factors, such as level of physical activity prior to the stressful event, or just facing a more skilled opponent can also influence appraisal. Therefore, we expect that daily successes and failures on combatives related interactions among participants would lead to a consistent evaluation of the soldiers' capability to meet the demands of training, and therefore influencing their self-efficacy beliefs.

Self-efficacy is strongly related to anxiety levels soldiers may experience during combatives anxiety. State anxiety, an unpleasant emotional arousal in face of threatening demands or dangers [11] depends largely on cognitive appraisal of threat [12]. According to Lazarus' [13,12] the three primary appraisals are goal relevance, goal congruence, and type of ego-involvement. Goal relevance concerns with whether anything is at stake by the involvement in the activity. In the current case, soldiers could be concerned with failing the course, thus feel anxious. Goal congruence or incongruence concerns whether the event or activity is evaluated as beneficial or harmful. This appraisal results in a positive or negative emotion depending on how the individual evaluates the situation. In a combatives setting, due to the physical confrontations, a participant can see the environment as harmful or threatening, therefore resulting in emotions such as anxiety. Ego-involvement refers to the level of commitment or potential damage to the self-system that the participation in the activity may engender. A combatives participant who lives up to a certain level of ego ideal may develop emotions about the course's potential outcomes. For these individuals it may be shameful to engage in physical/hand-to-hand confrontation and lose.

In accordance with Lazarus' [14] theory secondary appraisal comprise of blame or credit, coping potential, and future expectations. While all three of these appraisals are necessary, in a mandatory combatives environment coping potential makes an important contribution to the participants' level of emotion. A soldier, who believes that he/she can not cope with the mandatory training environment, or that confron-

tations could result in a potential loss of personal meaning, is very likely to experience feelings of anxiety.

At this time, empirical evidence of the impact of the new army training protocol on relevant psychosocial constructs highlighted in the Army Chief of Staff's *Memorandum for Record* (e.g., combatives self-efficacy, combatives anxiety) has yet to be examined. The purpose of this study was to describe changes in self-defense efficacy, self-efficacy for teaching combatives, and levels of competitive state anxiety during of a one-week US Army combatives instructor level-one instructor certification program training course. Additional aim was to contrast efficacy beliefs and state anxiety between soldiers volunteering for the training, and those who were ordered to attend. We expected that (a) Self-defense and teaching combatives efficacy beliefs would increase during the course, (b) state combatives anxiety (i.e. cognitive and somatic) would decrease during the course, (c) state combatives anxiety would be negatively correlated to self-defense and teaching combatives self-efficacy, and (d) volunteer soldiers would possess higher levels of self-efficacy and lower levels of state anxiety than those soldiers ordered to attend the training program.

MATERIAL AND METHODS

Participants

Participants were U.S. soldiers (n=25) attending the Army combatives level-one instructor certification program course at the combatives training facility in a military installation in the Southwest. Of the 30 course attendees, three soldiers declined participation in the study, and two soldiers discontinued participation because of injuries and failed examinations. The data of the two discontinuing soldiers were excluded from the data analysis. In this pilot study 4 out of the 30 participants were ordered to attend the training.

Instrumentation

Administrative Data Questionnaire

This questionnaire was designed to obtain general information about the participants. It included questions related to age, gender, military rank, training status (i.e. volunteered or ordered to attend), and previous martial arts training outside of Army Combatives.

Combatives Self-Efficacy Scale

This measure included subscales to measure Self-Defense Efficacy (SDE) and Teaching Combatives Self-Efficacy (TCSE). The Combatives Self-Efficacy Scale was developed specifically for this study. It is composed of six items that employ a 5-point Likert-type response format ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Items number 4 and 6 were aimed at measuring self-efficacy for teaching martial arts skills. The remaining items were intended to measure self-efficacy for self defense. Items on this scale asked self-defense questions such as *to what degree do you believe that you can defend yourself if you are attacked?*, and teaching combatives questions such as *to what degree are you confident that you can teach martial arts skills to others?*. This scale development followed guidelines listed on the Bandura's self-

efficacy website and book, and mirrors the format utilized by many self-efficacy studies over the past two decades. Bandura [1,2,10] advocates using specific self-efficacy measures for the particular task, rather than assessing self-efficacy as a global disposition. In this study, observed alpha coefficients for TCSE measurements ranged between 0.87–0.97, and for SDE between 0.80–0.95 before and after the course respectively.

State Combatives Anxiety Rating Scale

Cox, Robb, and Russell [15] modified the Martens, Vealey, and Burton [16] Competitive State Anxiety Inventory (CSAI-2) to afford rapid assessment of competitive anxiety during participation in competitive activities. The three items on this scale measure, respectively, cognitive anxiety, somatic anxiety, and self-confidence. Each item employs a 5-point Likert-type scale ranging from 1 (*not at all*) to 5 (*very much*). Results of previous investigations [15,17] have shown scores on the short version to be moderately correlated (0.60 to 0.70) with anxiety and self-confidence components of Martens et al.'s [16] original inventory. For this study, we used the cognitive and somatic anxiety items, but not the self-confidence item given the measurement of more relevant efficacy constructs. The item measuring cognitive anxiety asked, *I feel concerned about performing poorly during my fights, not knowing what to do under pressure or while losing, and that others will be disappointed with my performance*. The somatic anxiety item asked, *I feel jittery, my body feels tense, and my heart is racing*. Because of the nature of the training, it was critical to obtain a quick and effective measure of anxiety prior to any significant event in training. The single item per construct measurement provided by this scale provided an accurate and speedy assessment of the individual's state anxiety prior to a fight situation on a daily basis. In this study, observed alpha coefficients for cognitive anxiety measurements was 0.84, and for somatic anxiety 0.91.

Level 1 Combatives Course

During the level one course, soldiers are exposed to the basic techniques for close one-on-one combat. On day 1, participants receive specific instruction about the three basic distances for engaging in hand-to-hand combat. The instruction emphasizes on how most fights end up on the ground; therefore, the soldiers must be first proficient on the ground fighting techniques. These techniques include ground control, and submission holds such as joint locking and choking techniques. Soldiers participate in combatives situations on a daily basis where they attempt to apply control and submission holds to their opponents. Because individuals fight everyday and submission is the ultimate objective, soldiers must have high levels of self-efficacy and must be able to control their arousal levels in order to stay calm and be able to perform. On day 4 and 5 of the training the soldiers are evaluated on their combatives skills.

Procedures

Institutional Human Subjects Committee approval was obtained for this study. Following the provision of informed consent, participants completed all the self-efficacy and anxiety scales. More specifically, before the beginning of Day 1 training, participants completed the administrative data



Table 1. Pre, during, and post-training self defense and teaching self-efficacy, and cognitive and somatic state combatives anxiety.

Measurement occasion	n	Self-efficacy				State combatives anxiety			
		Self-defense		Teaching		Cognitive		Somatic	
		M	SD	M	SD	M	SD	M	SD
Pre-training	25	3.63	0.83	3.16	1.12	3.08	1.15	3.02	1.08
Day 1	25	3.57	0.58	3.28	0.97	3.32	0.95	3.08	1.08
Day 2	25	3.74	0.69	3.62	0.99	2.88	0.83	3.08	1.04
Day 3	25	3.81	0.68	3.78	0.90	2.72	0.94	2.96	1.1
Day 4	25	3.46	0.98	3.72	0.86	3.00	1.14	3.48	1.19
Day 5	25	3.92	0.72	3.88	0.84	3.04	0.98	3.32	1.11
Post-training	25	4.08	0.82	4.1	0.82	–	–	–	–

questionnaire, combatives self-efficacy scale, and the state combatives anxiety scale. Prior to the combatives sparring session occurring on each of the five days of the course, participants completed the self-defense and teaching combatives self-efficacy scale and the state combatives anxiety rating scale. After the training program concluded on Day Five, participants once again completed the combatives self-efficacy scale.

RESULTS

Self-Defense Efficacy and Teaching Combatives Self-Efficacy

The means and standard deviations for SDE and TCSE scores at each measurement point during the course are presented in Table 1. Repeated Measures ANOVA (RM ANOVA) was performed to obtain observed trends in self-defense and teaching combatives self-efficacy.

Figure 1A provides a depiction of the self-defense efficacy scores observed across the training course. Mauchly's test indicated that the assumption of sphericity had been violated in the repeated measures, $\chi^2(2)=62.7$, $p<0.001$, thus df in the analysis were corrected using Greenhouse-Geisser estimates of sphericity ($\epsilon=0.57$). SDE scores observed across the course differed significantly, $F(3.4, 82.7)=4.85$, $p<0.01$; significant positive linear trend was observed over the training course period, $F(1, 24)=9.19$, $p<0.01$, indicating an increase in SDE across the training week. Similarly, Figure 1B provides a depiction of the teaching self-efficacy scores across the training program. Mauchly's test indicated that assumption of sphericity had also been violated for this variable, $\chi^2(2)=68.2$, $p<0.001$, thus using Greenhouse-Geisser estimates of sphericity ($\epsilon=0.45$). Teaching self-efficacy increased significantly throughout the course of study $F(2.7, 64)=9.61$, $p<0.01$. The RM ANOVA analysis indicated a significant positive linear trend for teaching self-efficacy was noted, $F(1, 24)=19.1$, $p<0.01$. RM ANOVA revealed no significant changes in neither cognitive, $F(5, 120)=1.89$ $p>0.05$, nor somatic, $F(5, 120)=1.98$ $p>0.05$, state combatives anxiety throughout training.

Cognitive state combatives anxiety scores were negatively correlated with self-defense efficacy scores on all training

days (r s ranging from -0.21 to -0.47) although only significant ($p<0.05$) on Day 3, $r=-0.47$, and Day 5, $r=-0.50$. Somatic state combatives anxiety scores were also negatively correlated with self-defense efficacy scores on all training days (r s ranging from -0.04 to -0.23) but these correlations failed to reach accepted significance level ($p>0.05$).

Only a descriptive analysis is presented to contrast participants who volunteered or were ordered to take part in the course because of sample size limitations. Mean observations indicate volunteers scored higher in self-defense efficacy, teaching combatives self-efficacy, and lower in state combatives anxiety. Figure 2 presents the comparison of these groups during pretest and post-test evaluations for all measures.

DISCUSSION

Self-Defense Efficacy and Teaching Self-Efficacy

According to the Chief of Staff of the Army guidelines, it would be optimal for individuals who are to become combatives leaders to be self-efficacious in combatives skills. These instructors will be responsible to pass on combatives-related skills to the soldiers in their units as they return to their current stations, and begin a combatives program. Self-efficacy has been found to contribute to levels of participation, motivation, and adherence in a variety of tasks [1–3,5–7]); therefore, higher levels of self-efficacy can be considered beneficial for the objectives of the program. The results of this study are consistent with our first notion, and consequently, provide preliminary evidence that the combatives training contributes to the levels of self-defense efficacy and teaching combatives self-efficacy among program participants.

We also expected for the levels of state combatives anxiety to decrease during the course. Non-significant changes in state anxiety throughout the course were revealed. However, descriptively, observed cognitive and somatic state anxiety means appeared to be in a decline until Day 4 of the training. In a combatives setting, the appraisals that lead to anxiety include many factors that can change from day-to-day, and from situation to situation; therefore, we

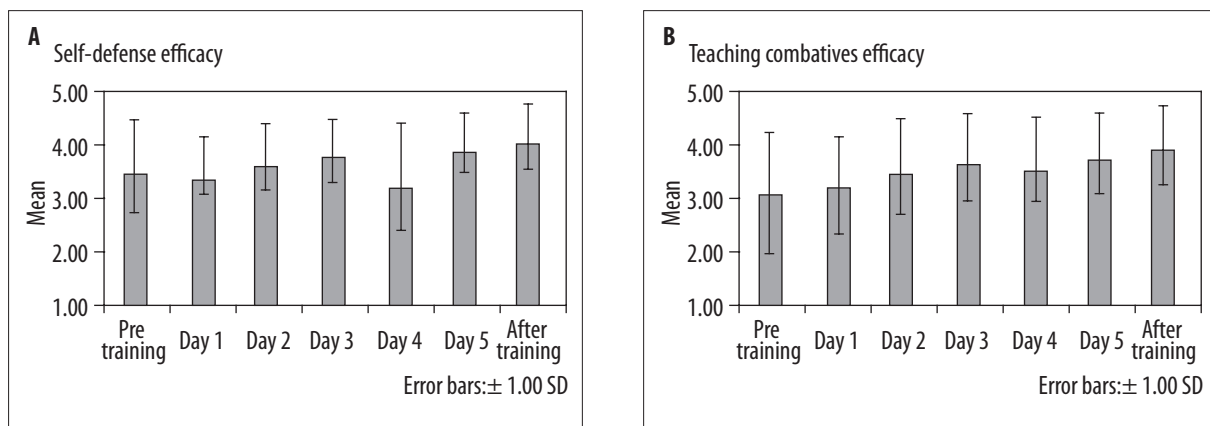


Figure 1AB. Self-defense efficacy progression for each training day.

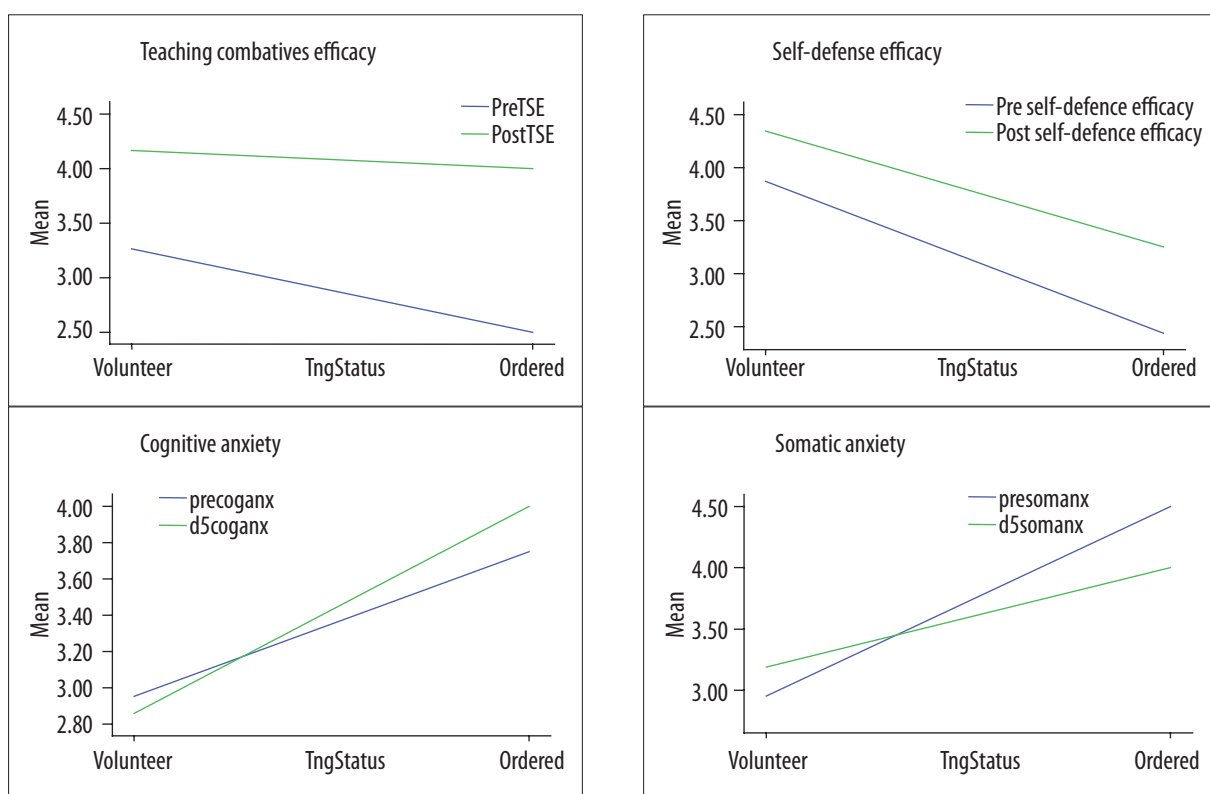


Figure 2. Mean scores of volunteer and ordered participants in TCSE, SDE, CSPA, and SSCA.

assume that the environmental demands presented during Day 4 and 5 of the training may have affected the participants' appraisal.

In theory, an appraisal that includes a belief that one can perform the activity should contribute to lower levels of state anxiety. However, the results of this study showed a slight decline in self-efficacy when the environment became more challenging or stressful during day 4 and 5. For example, on Day 4 of the training, all participants' combatives skills were to be evaluated, an event considered stressful. On this day, participants scored the highest somatic and second highest cognitive anxiety in the study while at the same time scoring the lowest SDE levels of the entire training period. From the early studies of self-efficacy in sports

settings there always been a negative relationship between anxiety and self-efficacy [4,19,20]; similar to the current study's findings.

Descriptive data supports the notion that volunteering is associated with higher levels of combatives self-efficacy, teaching self-efficacy, and lower levels of state combatives anxiety. However, the results related to teaching combatives self-efficacy are promising due to the noted increase in TCSE from pre-to-post evaluation for those ordered to attend the training. The results of this study appear to indicate that volunteers are more likely to be high in self-defense and teaching self-efficacy, but soldiers ordered to attend can also develop self-efficacy about their teaching ability. Nevertheless, in order to effectively comply with the guidelines of the program,



it would be optimal for instructors to be efficacious in both self-defense and teaching combatives skills.

CONCLUSIONS

The findings of this study are limited by its relatively small sample size imposed by military regulations. Out of the 30, some chose not to participate and some were lost due to injury or course failure. However, one should consider that Army wide mandatory combatives training is a new phenomenon with significant implications to soldier readiness and national security. The ability of soldiers to face their enemy in combat is one of the most critical skills they can possess. Facing an enemy, known or unknown, may evoke certain emotions such as fear and anxiety. The current findings indicate that exposure to the combatives training alone may not be sufficient for the soldiers to learn to regulate the emotions that may support increases in self-efficacy. In accordance with Bandura [3], enhancing physical status, reducing stress levels and negative emotional proclivities, and correcting misinterpretation of bodily states is a major way of altering efficacy beliefs. If participants, even those in mandatory status, learn how to regulate their arousal levels, and be “in the zone”, they may be able to gain more from the training environment. Therefore, future studies should implement combatives specific coping strategies to investigate the impact of these techniques in overall combatives self-efficacy, state combatives anxiety, and how these variables impact motivation for continued participation in similar activities and events.

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