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Technical Efficiency in Shackled Actions after A Short Audiovisual Training Session

Domingo Jesús Campo Ramos[1,*], Antonio A. Sánchez Peraza[2], José Juan Robles-Pérez[3], Pedro Montañez-Toledo and Vicente Javier Clemente-Suárez[1]

[1]*Department of Physical Activity and Sports Science, Sports Science Faculty, University of Castilla la Mancha, Toledo. Spain*

[2] *Spanish National Police Corp*

[3]*Department of Melee Combat and Self Defense, Military Sports Area, Central School of Physical Education of the Army, Toledo, Spain*

Abstract: *Introduction:* Shackled maneuver was poorly studied in specific literature despite being a technique used every day for security and police forces. The use of new technologies had reported important benefits in learning process and could improve shackled learning process. Therefore, the objectives of the present research were: (i) to analyze the effect of an audiovisual training on the efficiency in shackled technique in three different stress situations and (ii) to study the week point in the shackled maneuver to know how to improve the audiovisual training. *Methods:* Technical procedures in shackle techniques in 3 different situations of 26 male soldiers were analyzed after an audiovisual session. The situations were normal, alert and danger. All the shackle interventions were filmed by a video camera and were analyzed later. Shackle maneuver was divided in approach to the subject, subject control, placing the first shackle, limb immobilization, placing the second shackle, frisk and transfer. Every part of the shackle maneuver was evaluated with 10, 5 or 0 point. *Results:* Maneuver efficiency decreased with the stress. There was significant difference in the placement of the second phase shackle between the normal and alert situations and in all the situations the limb immobilization phase obtained the lower values. Furthermore, the execution time was lower in normal (40.30 s) than in alert (120.08 s) and danger situations (180.36 s). *Conclusion:* A short audiovisual training was enough to learn the proper shackled procedure in non experimented soldiers with a low technical level in the limb immobilization phase and differences between the stress situation in the placing the second shackle phase. Also, the increase in stress caused an increase in the maneuver time, and an increase in number of the video reproductions.

Keywords: Audiovisual, immobilization, shackled, soldiers, stress, subject control.

INTRODUCTION

Researches focused on soldiers' populations have studied cognitive aspects as decisions making of officers [1], coordination of units in battlefield [2] or analysis of weapons used in combat [3]. Specific studies have studied accumulated fatigue in combat maneuvers [4], body composition, power and strength before and after carrying out different missions [5] and the analysis of different tests and its correlation with performance in battle [6-8]. Another field of study in military researches was the beneficial effects produced by the intense military exercise [9-12]. Recently, Clemente and Robles [13, 14] have attempted to delimit the organic response of soldiers in simulated combat, showing how combat affects different physical, psychological and biochemical parameters in soldier, producing symptoms of central nervous system fatigue and involving an increase in the anaerobic metabolism.

The results of previous studies have been used to enhance the actual combat technical training in operation areas. Currently in many actual missions, soldiers have to carry out missions in peacekeeping which become important nonlethal immobilization techniques. The shackled or technique designed to immobilize the hands of a person by handcuffs or shackles in order to prevent attacks or attempted escape is an important tool that is used daily in the current peacekeeping missions and operation areas. Furthermore, there is a specific technique not only used by the army, but is a commonly technique also used by the police, civil guards, gendarmes and security corps.

The training of shackled maneuvers is not incorporated into the programs of the defense corps even though this is essential for proper security and to arrest the offender. Therefore, it is necessary to provide a fast and effective training program that allows the inexperienced soldiers to learn quickly the shackled techniques before to serve in a

*Address correspondence to this author at the Avd de Los Jeroninos s/n. 30107, Guadalupe (Murcia). España. Universidad Católica San Antonio; Tel: +34 968278800; E-mail: domingojesusramos@gmail.com

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Fig. (1). Phases of shackled manoeuvre in normal situation.

Soldier had to shackle an unarmed pacific person. In this technique even the person cooperates, the soldier maintains the control over it to perform the process of shackled after order the person to place the arms extended and the legs separately.

mission. Moreover, the rapid growth of new technologies of information and communication could help to improve the learning process of shackled, as previous studies demonstrated that the use of video protocol improves performance in tennis players [15]. Therefore, the objectives of the present research were: (i) to analyze the effect of an audiovisual training on the efficiency in shackled technique in three different stress situations and (ii) to study the week point in the shackled maneuver to know how to improve the audiovisual training. It was hypothesized that after an intensive audiovisual training, soldiers could perform the shackled procedure in normal, alert and danger situations with at least a medium level of actuation.

METHODS

Technical procedures in shackled techniques in three different situations of 26 male soldiers were analyzed after an audiovisual training sessions. Soldier had no experience in shackled procedures and all of them had only conducted the basic military training. The study intended to analyze the efficiency of a short audiovisual shackled training in non experimented soldiers, for this reason soldiers did not conduct a pre-training sample, with the aim that soldiers had no previous experience with shackled.

The three different shackled situations were as follow: normal situation, alert situation and danger situation. The shackled procedures in each situation are shown in Fig. (**1**, **2** and **3**). The audiovisual sessions and the technical evaluation were performed randomly in different days with a separation of one day between them.

In the procedure followed, soldiers were divided in pairs to watch a training video in a *tatami*. Only one instructor and the pair of soldiers were in the *tatami*. The instructor gave instructions to soldiers to watch the video in which was explained how to realize a correct shackled procedure for a maximum of three times, with the premise of when they understood the technical procedure they had to stop the reproduction finishing the audiovisual session, the pair of soldiers decided how many reproduction of the video required. After that, the soldiers received orders from an officer who explained the specific situation in which they were explained the procedure to perform the shackled action. The characteristics of each of the three situations conducted were according to real situations occurring in current missions. Then, soldiers had to perform a shackle action with an unknown subject, which was the same for all the participants in the study. All the shackle interventions were filmed by a video camera (Panasonic SD40), and were analyzed by three different instructors in shackled procedures to determinate the punctuation in the different part of a shackled maneuver. The instructors were professors of military martial arts and were also assigned to teach shackled procedures to the troops, and had an experience in the area more than 8 years.

Shackled maneuver was divided in the following parts: approach to the subject, subject control, placing the first shackle, limb immobilization, placing the second shackle, frisk and transfer. Every part of the shackled maneuver was evaluated with 10, 5 or 0 point depending on the following criteria:

Approach to the subject: 10 points when the soldiers approached to the subject by their dominant

Subject control: 10 points when the soldier had a firm grip, strong and proportional appropriate point on the limb to shackling

Placing the first shackle: 10 points when the first ring was placed properly depending on the situation of the soldiers respect to the subject.

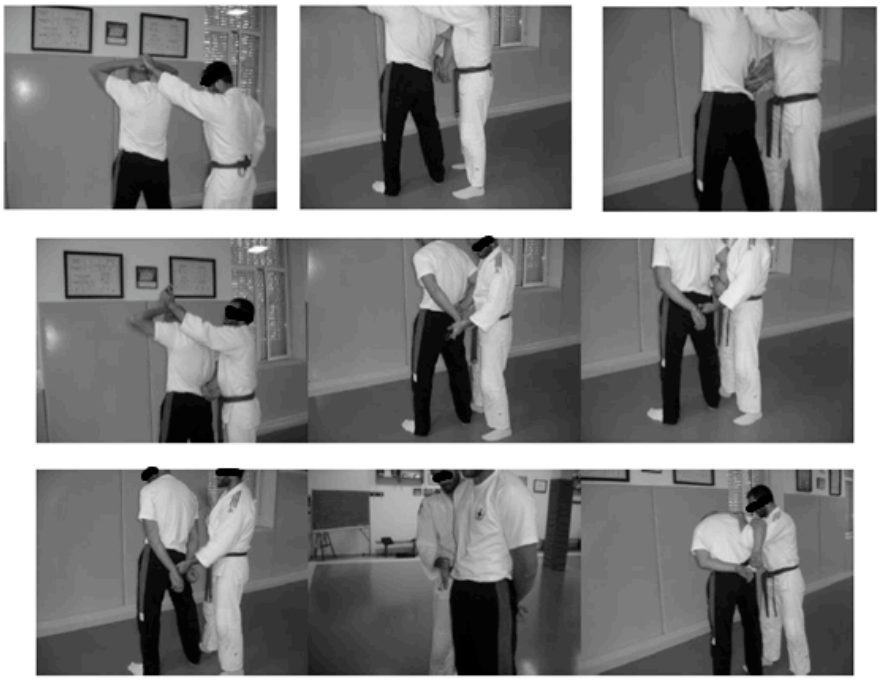

Fig. (2). Phases of shackled manoeuvre in alert situation.

In this situation soldier had to shackle a person which could carry a concealed weapon and did not cooperate with the soldier. Then, soldier order the person to place the hands on the nape and the legs separately. Soldier ensures control points and then starts the shackled manoeuvre.

Fig. (3). Phases of shackled manoeuvre in danger situation.

In this situation soldier had to shackle a person identified previously as a terrorist, he possibly carry a concealed gun or knife and did not cooperate and tries to escape from the soldier. Then, soldier order the person to lie in prone position with the arm extended and separately from the trunk. With one knee control the neck of the person and then star to shackle one arm, after immobilize it soldier shackle the other arm.

Limb immobilization: 10 points when the first ring was placed, a rotation of the tip and dislocation of the hand were performed.

Placing the second shackle: 10 points when soldier proceeded to place the second ring in the subject performing a technical or normal shackle technique.

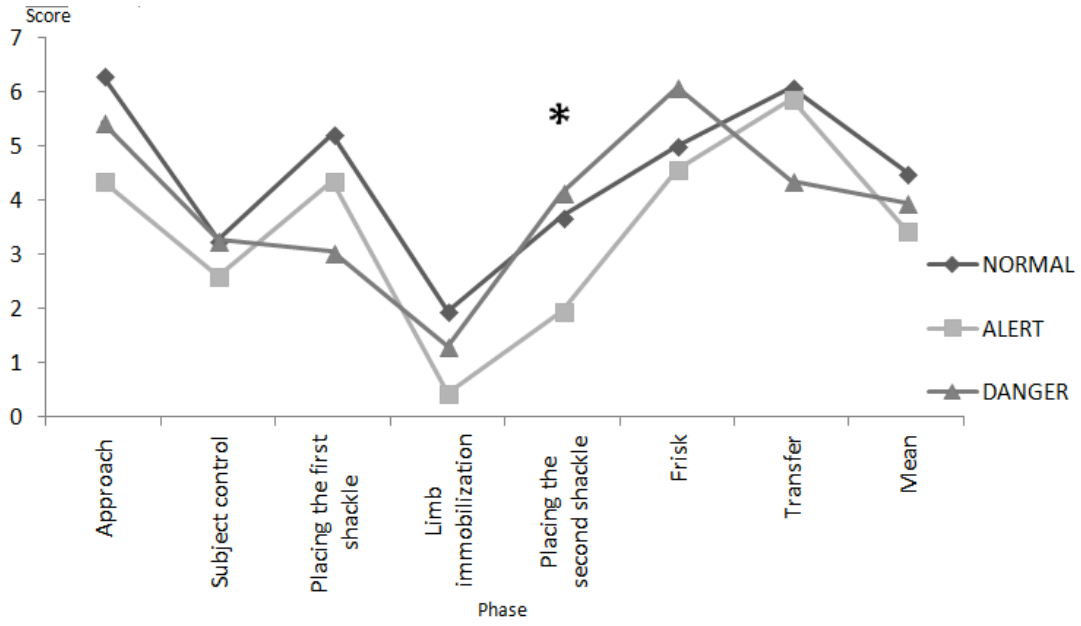

Fig. (4). Score in all shackled phases in the three situations measured.

Table 1. Percentage of Number of Soldiers and Reproduction of Video in the Three Situations Analyzed

Number of Video Reproductions	Normal (%)	Alert (%)	Danger (%)
1	52,2	47,6	30,4
2	47,8	52,4	52,1
3	0	0	17,4

Frisk: 10 points when subject was executed methodically and controlled.

Transfer: 10 points when subject was placed sit in the floor and got it up and also the soldier dislocated shoulder and placed his other hand on the neck of the subject.

The punctuation of the shackle technique was conducted watching the video of the maneuver by the 3 instructors, then they had to decide one punctuation for each part of the shackle maneuver. We used this evaluation system because it is the standard evaluation system of the Army and it is used to evaluate the technical efficiency of soldier in shackle procedures.

Data were analyzed using the SPSS 17.0 statistical program. The Shapiro-Wilk normality test was used to test homogeneity of each variable. Analysis of variance was used to analyze the differences between the three shackled situations in each part of the shackled maneuver. The level of significance for all the comparisons was set at $p<0.05$.

RESULTS

The shackled technique was less effective in alert situation (Fig. **4**). A significant difference in the placement of the second phase shackle between the normal and alert situation ($p = 0.047$) was measured. Although no significant differences in any other variables were found, we observed a low value in control phase of the aggressor in alert situation and also lower values were found in danger situation in the placement of the first shackle phase and in transfer of the offender phase.

The mean punctuation on the shackled maneuver was higher in normal and danger than alert situations. Furthermore, the execution time was lower in normal (40.30 s) than in alert (120.08 s) and danger situations (180.36 s). Table **1** showed the percentage of viewings the audiovisual technical instructions by each soldier.

DISCUSSION

The objectives of the present research were: (i) to analyze the effect of an audiovisual training on the efficiency in shackled technique in three different stress situations and (ii) to study the week point in the shackled maneuver to know how to improve the audiovisual training. Results showed different time to realize the maneuver and number of visualization of the audiovisual technical instructions depending on the stress of the situation and a poor actuation especially in the limb immobilization phase in the three situations analyzed.

Analysis of the results showed that soldiers are more effective in shackled maneuver in normal than in danger and alert situations. It shows that when the stress is increased the effectiveness of the maneuver decreases. Furthermore, a higher perception of danger produces an increase in the time to realize the shackled maneuver and an increase in the number of video watching. The higher time to realize the

maneuver could be related to the decrease in information processing and cortical activation produced by the stress, that produce a decrease in the neurocortex control and a decrease in quality of actions performed by soldiers [13, 14]. In addition, during these situations the brain can perceive any action as a possible hostile threat that can damage the integrity of the soldier; this process could cause a state of anxiety [16] that negatively influenced in the technical maneuver.

In normal situation, there is a deficit in the immobilization and positioning of the second shackle. These two phases of the maneuver required a highly physical implication of soldiers, to improve physical performance, especially leg strength could improve the performance of soldiers in these phases. These results were also observed in alert condition. Furthermore, the lowest score measured in the three situations was in these phases, therefore it is necessary to focus on the learning process in these phases to try to improve them. It is remarkable that the mean score in stress situation was higher than in the alert situation. This fact could be explained since in danger situation the soldier could perceive the situation as a threat, that may endanger his life, with the consequent increase in the level of attention and activation that causes in the organism a state of constant alert in order to respond quickly to any threat and improve the technical procedure in the shackled maneuver [14].

The results obtained showed that audiovisual training strategies could be used to complement specific soldiers training in operations area. The training actions should be performed in a high stress situation to conduct the maneuver in a specific ambient that could produce a higher improvement in shackled procedures performance, as reported in previous studies that showed the necessity to improve stress management training systems [13, 14]. This is also related with the importance of psychological training and the increase of the ability to deal with stressful situations, which are related to the tunnel effect and the decision and reaction time in a close quarter combat situations [14], situations that might precede the shackled actions.

Numerous studies conducted on car drivers [17], swimmers [18] and sports combat athletes [19] have shown the importance of the use of technical video training. The duration and frequency of video viewing were higher in the literature than in the present study. Also, depending on the complexity of the technique and the situation stress, soldiers required higher number of video reproduction with higher stress and complex techniques. It should be noted that with a maximum of three reproductions, the inexperienced soldiers could perform correctly the shackled maneuver. Therefore, with a short time audiovisual training, soldiers could learn the different shackled techniques, performing them with a notable level of efficiency even in stress situations.

The new requirements of current missions make it necessary to have a standardized and efficient training of the principal military abilities that soldiers have to use in the operation areas and that could be realize by soldiers in a short period of time with the minor use of recourses. The implementation of the new technologies of information and communication could be an important tool to teach the shackled procedures in a short period of time obtaining a correctly technical actuation of soldiers.

CONCLUSION

A short audiovisual training was enough to learn the proper shackled procedure in non experimented soldiers with a low technical level in the limb immobilization phase and differences between the stress situations in the placing of the second shackle phase. Also, the increase in stress cussed an increase in the maneuver time, and an increase in number of the video reproductions.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest.

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Declared none.

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