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EDITORIAL INTRODUCTION

The eighth issue of the *Journal of Security and Criminal Sciences* presents four interesting articles in different disciplines: forensics, security in emergency situations, special physical education and road traffic safety. This completes the experience of the field of security, because today security permeates almost every form of social activity. We would single out Saša Mićin's article as the most interesting.

Indeed, Saša Mićin and his co-authors (Tatić, Hrvač) deal with a new way of identifying people in the article entitled "Modern methods of human identification using gait characteristics. The authors' article "presents the systems of biometric personal identification using gait characteristics based on input data", emphasizing the use of different techniques, "algorithms for extracting and selecting characteristics, different classifiers in the classification process, including databases used to evaluate and compare the efficiency of the system." Biometric gait recognition systems are regarded as novel systems characterized by intensive development. It was emphasized that "the advantages of these systems are reflected in the possible use at larger distances between the subject and the identification system."

Žana Vrućinić and Žarko Marčeta addressed the Psychosocial Support by Rescuers and Volunteers in the Circumstances of Natural Disasters, They emphasized that the potential of natural disasters to harm human health is very great and the need to recognize natural disasters and point to the importance of "effective disaster risk management at the national and local levels", as well as the importance of preventive action in the aforementioned. The results of the research, according to the authors, should be indicators in finding practical solutions in the natural disaster management in all stages. The most important stages include the inclusion of psychosocial assistance activities in the planning and implementation of preparedness measures, immediate response measures, and quick response and recovery measures.

Nenad Rađević and his co-authors (Paspalj, Vulin, Kovačević), in their study *Self-assessment of motor skills by students*, conducted research on a sample of 43 students with the aim of determining the relationship between the self-assessment of motor skills by students at the Faculty of Security Studies and the results obtained based on the application of appropriate tests for the assessment of students' motor status. The authors point out that the results of this research indicate the importance of the application and implementation of the Special Physical Education program in the education of persons in the field of security. Also, this research can show students the importance of regular physical exercise and help them "gain a realistic picture of the physical and health status of a person in the field of security." Finally, the authors conclude that every police officer should develop an awareness of improving his health and motor skills "through individual work in the field of physical exercise."

Aleksandar Đekić deals with traffic policing in road safety in the article entitled the "Specificities and Characteristics of the Criminal Offense of Endangering Road Traffic Safety and Police Action Regarding This Offense. The focus of his research is the criminal offense of endangering road traffic safety. While discussing traffic, the author points out that road traffic today represents one of the basic human needs. He concludes that "there is a need for constant professional development of police officers who investigate traffic accidents."

The monograph *Identity, Conflict, Security – Hate Crimes in Bosnia and Herzegovina*, the first book by Velibor Lalić, is presented (review written by Predrag Ćeranić) as a book that captivates the reader with good writing flow, and the topic covered deserves special attention in Bosnia and Herzegovina. Hatred is, obviously, the centuries-old driver of many crimes committed in the name of religion, or the protection of their people, by members of all "peoples and nationalities" in Bosnia and Herzegovina. Lalić writes in a clear, easy-to-understand style even when he discusses difficult situations and experiences. Not a single aspect was neglected, not a single side in the "Bosnian pot" was favored.

In conclusion, the eighth issue of the *Journal of Security and Criminal Sciences* justified the publisher's effort to provide a wider readership with an insight into the most significant segments in research related to security studies.

Editor-In-Chief

Predrag Ćeranić

CONTENTS

MODERN METHODS OF HUMAN IDENTIFICATION USING GAIT CHARACTERISTICS

Review Article

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Abstract: Automatic systems for personal identification based on gait occupy an important place among biometric identification systems. The development of information technologies has enabled a very intensive development and application of these systems in criminal and security sciences. This paper presents the systems of biometric personal identification using gait characteristics based on input data collected using different techniques, algorithms for extracting and selecting characteristics, different classifiers in the classification process, including databases used to evaluate and compare the efficiency of the system.

Keywords: biometric characteristics, gait recognition, identification

INTRODUCTION

Biometric recognition is one of the most important methods of personal identification, which has been frequently been used in various fields, especially criminal and security sciences, and forensics (Jain, Ross, & Nandakumar, 2011). Developed systems are based on the measurement and analysis of various unique physical and behavioral characteristics of a person. The most commonly used characteristics are papillary lines, iris and retina, face, handwriting, and voice (Takemura, Makihara, Muramatsu, Echigo, & Yagi, 2018). Personal identification based on gait patterns is a more recent method.

Gait is one of the basic human activities and represents the basic way people move. It is classified as a complex biometric behavior characteristic that is based on Newton's third law – the principle of action and reaction (Whittle, 2007). Studies have shown that human gait is characterized by 24 different components, that is, that each person has a specific musculoskeletal structure, which is the basis for identification (Kale, Sundaresan, Rajagopalan, Cuntoor,

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Roy-Chowdhury, Kruger, & Chellappa, 2004). Research has confirmed the possibility of recognizing people and a person's gender based on human gait patterns (Cutting & Kozlowski, 1977). The influence of various factors (gender, body weight, feeling, emotion) on human gait patterns was analyzed (Troje, 2002).

The beginning of the development and application of automatic systems for personal identification based on human gait patterns can be linked to the study by Niyogi and Adelson, which was based on a database with a small amount of data (Niyogi & Adelson, 1994). Further research was mainly carried out using video recordings, where the so-called model-based approach involving the formation of a model of the human body based on video recordings and extraction of the features that correspond to the physical model of the human body was mainly used (Wang, Ning, Tan, & Hu, 2004). In order to research, test and verify the proposed methods, the authors created input data databases with different covariance.[2] The first publicly available gait recognition database was released in 2005 as a part of the *HumanID* program developed by the Defense Advanced Research Projects Agency – DARPA[3] (Sarkar, Jonathon Phillips, Liu, Vega, Grother, & Bowyer, 2005). The development of a model-free approach based on extracting a person in motion from the background and deriving a human silhouette began in 2006 (Man & Bhanu, 2006). Further development of algorithms for data processing has enabled the recognition of human gait, which is used to identify the emotions of the observed person (Mathivanan & Perumal, 2021).

Some characteristics of biometric identification based on human gait patterns, such as the possibility of recognizing a person at greater distances between the object of identification and the identification system, the use of several different simple recording devices with low resolution, recognition without the cooperation of a person (Kim, & Paik, 2010), difficult imitation of gait patterns and movement, give this method an advantage over other biometric methods (Nixon & Carter, 2004).

MODERN METHODS OF PERSONAL IDENTIFICATION BASED ON GAIT PATTERNS ANALYSIS

In general, the basic elements of a biometric system for gait-based personal recognition are data collection, feature extraction, feature selection, and classification (Wan, Wang, & Phoha, 2018).

2 Covariance is a measure of the relationship between two random variables and to what extent they change.

3 DARPA is an agency of the United Statets Department of Defense responsible for the development of emerging technologies for use by the military.

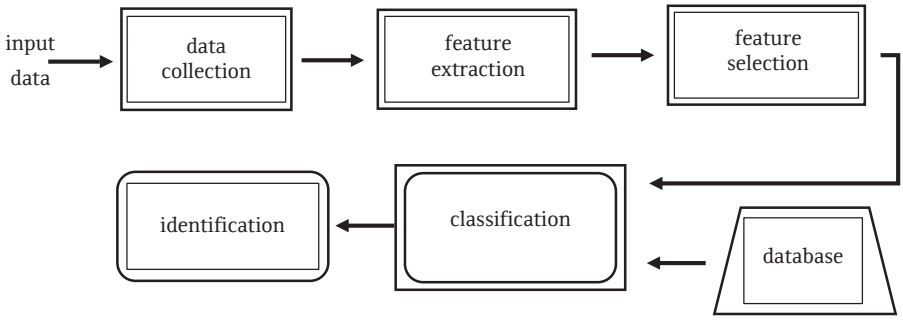


Figure 1: Block diagram of the biometric system for gait-based person recognition

A similar block diagram of a biometric system for gait-based person recognition was proposed by Kastaniotis et al., which contains a preprocessing module, a feature extraction module, a pattern classification module, and a result module (Kastaniotis, Theodorakopoulos, Economou, & Fotopoulos, 2016).

Data Collection

The data collection module includes the acquisition of spatiotemporal data related to human gait. The data was collected using video cameras, accelerometers, floor sensors and continuous-wave radar (Wan et al., 2018). One or more RGB cameras are often used. The use of one camera enables identification based on the so-called 2D gait signature in contrast to the use of multiple synchronized cameras, which significantly increase the possibility of applying input data (3D gait model creation, 2D gait signature creation with additional elements (the so-called 2.5D gait signature), invariant gaze tracking) (Makihara, Nixon, & Yagi, 2021; Santos, Tavares, & Rocha, 2022).

Similar results can be achieved by using the so-called depth sensors of which the most famous is Microsoft Kinect[4] (Khoshelham, 2012), on the basis of which several gait recognition systems have been developed (Dikovski, Madjarov, & Gjorgjevikj, 2014).

4 Kinect is a line of motion detection input devices manufactured by Microsoft, which was released in 2010. These devices generally contain RGB cameras, infrared projectors, and detectors that map depth through structured light or time-of-flight calculations, which in turn can be used to perform real-time motion recognition and body skeleton detection, among other capabilities. They also contain microphones that can be used for speech recognition and voice control.

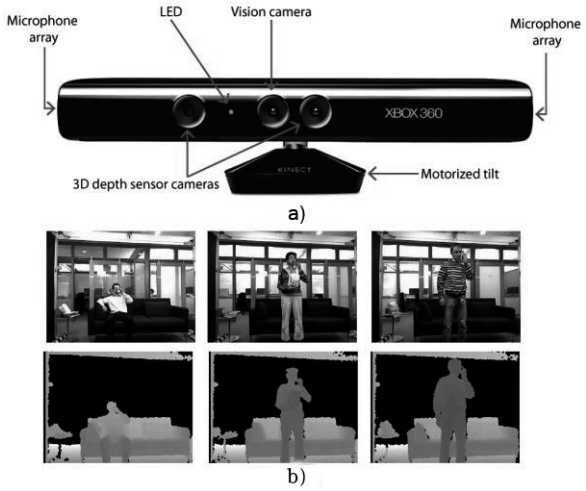


Figure 2: Presentation of 3D camera and input RGB-D data a) Microsoft Kinect device b) input RGB-D data (images) captured by Microsoft Kinect device (Ly Quoc Ngoc, Vo Hoai Viet, Tran Thai Son, & Pham Minh Hoang , 2016).

The input data collected by the accelerometer[5] was used to develop biometric identification systems based on gait (Derawi & Bours, 2013). In general, the accelerometer-based systems are placed on the human body, recording the three-dimensional accelerations of characteristic points on the body during walking, which represent the input data for the given system (Semwal, Gaud, Lalwani, Bijalwan, & Alok, 2021).

When walking, people produce different intensity of pressure on the surface on which they move, which provides the possibility of identification. On the basis of input data obtained by means of floor sensors, walking pattern is modeled and then the person is identified (Nakajima, Mizukami, Tanaka, & Tamura, 2000). The classification algorithm for processing steps called Distinction Sensitive Learning Vector Quantization (DSLVQ) was developed (Suutala & Röning, 2004). It has been shown that the impact of footwear on input data can be reduced (Orr & Abowd, 2000). The floor sensors used include OR6-7 force plate, a sensor mat, load cells, and electro-mechanical film (EMFi)[6] (Wan et al., 2018).

5 Accelerometers are sensors that measure acceleration, that is, inertia force. They can measure acceleration in one or more directions, where those directions are perpendicular to each other.

6 A thin, flexible material, which consists of cellular, biaxially oriented polypropylene film coated with metal electrodes. An external force affecting the surface of the EMFi causes a change in the thickness of the film, resulting in an electric charge between the conductive metal layers. It can be detected as a voltage, which describes changes in the pressure affecting the film.

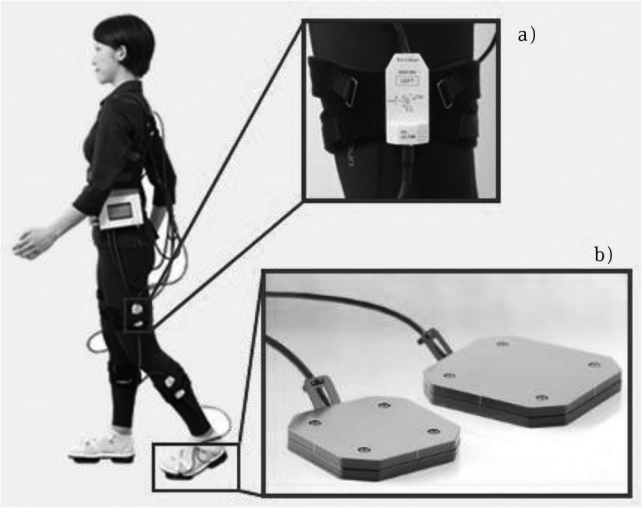


Figure 3: Wearable sensor system a) inertial sensor (accelerometer) b) floor sensors (Muro-de-la-Herran, Garcia-Zapirain, & Mendez-Zorrilla, 2014).

In addition to the previously mentioned ways of collecting input data, research was carried out related to the use of radar systems for the purpose of identifying persons based on human gait. The system functions based on the Doppler effect using a continuous spectrum radar[7] with electromagnetic waves characteristic of the microwave region of the spectrum of electromagnetic radiation. Tests were also conducted using ultra-wideband Doppler radar[8] and micro-Doppler effect in the radar[9] (Wan et al., 2018). Based on previous research, Yamada et al. presented a biometric identification method for gait recognition using real-time multi-line LiDAR[10] (Yamada, Ahn, Martinez Mozos, Iwashita, & Kurazume, 2020) to collect input data.

Extracting gait characteristics

Gait characteristics used in gait recognition systems can be classified into two groups, static and dynamic (Rao, Sahu, & Parida, 2021). Static character-

7 A continuous wave or continuous waveform (CW) is an electromagnetic wave of constant amplitude and frequency, typically a sine wave, which, for mathematical analysis, is considered to be of infinite duration.

8 Ultra-wide-band (UWB) radars produce very short radio-frequency (RF) pulses in the range of a sub-nanosecond and are used for sensing and imaging applications.

9 If the observed/recorded subject has mechanical vibrations or rotations, modulation frequencies can be induced on the return signal that generate sidebands spaced at the Doppler frequency of the observed subject.

10 LiDAR (Light Detection and Ranging) – an optical system that emits laser beams to an object and detects the beams reflected back.

istics refer to the anthropometric parameters, while the dynamic parameters are related to the trajectory of individual elements of the skeletal system. These two approaches have been developed for processing input raw data and presenting the processed data collected through video cameras. The model-based approach represents movement modeling and calculation of gait characteristics based on a created movement model based on spatial and temporal data (Lee & Grimson, 2002). The structure of the human body is used, mainly the kinematic characteristics of the human locomotor system. It requires higher resolution input data (images) and is conditioned by higher computer processing costs (Makihara et al., 2021). After the formation of the movement model, the characteristics are extracted from the given model. In the model-based approach, the extracted characteristics predominantly include the distance and angles of individual points on the human body.

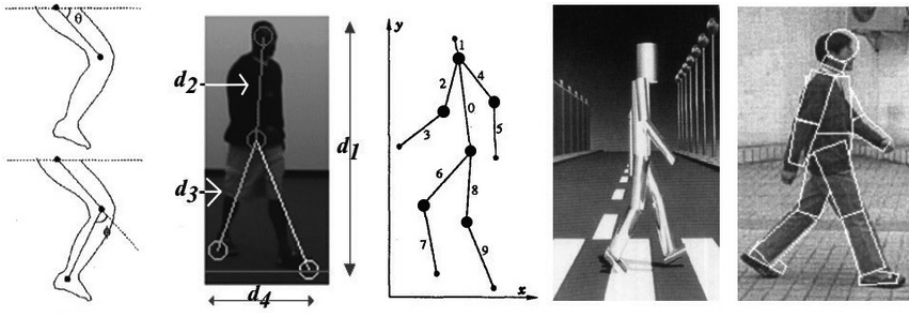


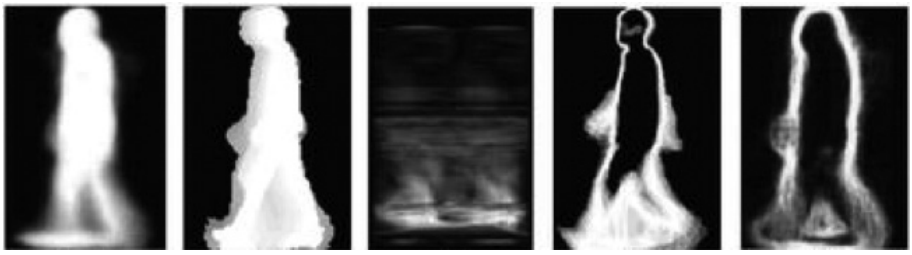
Figure 4: Input data processing using the model-based approach a) joint model; b) static human parameters; c) stick model; d) volumetric model; e) static and dynamic characteristics (Sun, Wang, & Li, 2017).

Several biometrics personal identification systems based on gait, which are based on different models, have been presented (Table 1).

Table 1: Models used to create the movement model (Makihara et al., 2021; Wan et al., 2018)

Model	
Single oscillator	Joint Model
Ellipsoidal fits	Dual oscillator
Kinematic features	Linked features trajectories
Stride parameters	Stick model
Human parameters	Layered deformable model
Joint trajectories	Marionette mass-spring model

Model-free approaches use the whole motion pattern of the human body, that is, the input data are taken directly from the movement sequence of the observed subject without fitting a model (Makihara et al., 2021).



a) b) c) d) e)

Figure 5: Input data processing using a model-free approach a) gait energy image; b) motion silhouette image; c) shape variation-based image; d) gait entropy image; e) compressed silhouettes image; (Sun et al., 2017)

During the extraction and presentation of the characteristics of human gait, different algorithms were used for the processing of individual characteristics (Table 2).

Table 2: Model for representing and extracting gait features based on a model-free approach (Makihara et al., 2021; Wan et al., 2018)

Model
Silhouette similarities
Motion-history image, MHI
Motion-energy image, MEI
Gait History Image, GHI
Gait Energy Image, GEI
Gait energy volume, GEV
Frame Difference Energy Image, FDEI
Gait Gaussian Image, GGI
Gait Entropy Image, GEI
Flow Histogram Energy Image, FHEI
Gradient Histogram Gaussian Image, GHGI
Active energy image, AEI
Distance-based features
Gabor filter
Learned features using a convolutional neural network, CNN
Hidden Markov model

The methods of extracting features based on the input data collected by means of the accelerometer can be divided into two groups. Gait-cycle-based features are based on the average gait cycle, which is the basis for the classifi-

cation procedure (Wan et al., 2018). Frame-based feature extraction and representation divides the input data into multiple individual groups, from which a feature vector is extracted for each group. The set of extracted vectors is the basis for classification (San-Segundo, Cordoba, Ferreiros, & D'Haro-Enriquez, 2016). Previously, the development of biometric identification systems based on gait using multiple accelerometers was started, that is, the merging of isolated features using multiple accelerometers simultaneously (Chen, Liang, Zhao, Hu, & Tian, 2009).

The features extracted from floor sensor data include body mass, cadence, and stride length (Jenkins & Ellis, 2007).

Doppler frequency shift is the basis for extracting features when using radar biometric personal identification systems based on gait (Wan et al., 2018).

The selection (reduction) of features

The selection (reduction) of features previously extracted represents the extraction of irrelevant and bad features by means of appropriate algorithms. There are different approaches to feature reduction: a) the filter-based approach,[11] b) the wrapper-based approach,[12] c) the embedded-based approach[13] (Jović, Brkić, & Bogunović, 2015).

The most commonly algorithms used to select and extract features are the principal component analysis (PCA), Linear Discriminant Analysis (LDA), a combination of the principal component analysis and the linear discriminant analysis, and Piecewise Linear Representation (PLR) (Rao, et al., 2021), Discrete Cosine Transform (DCT) (Fan, Jiang, Weng, He, & Liu, 2016), and I-vector (San-Segundo, Echeverry-Correa, Salamea-Palacios, Lutfi, & Pardo, 2017).

In addition to the aforementioned algorithms used for feature selection, the existing studies also mention the application of the Gabor features and General Tensor Discriminant Analysis, Modified Independent Component Analysis (MICA), Discrete Wavelet Transformation (DWT), Fourier descriptors, Canonical Analysis, Sparse Bilinear Discriminant Analysis (SBDA), General Tensor Discriminant Analysis (GTDA) and Discriminant Analysis with Tensor Representation (DATER) (Wan et al., 2018).

In this module, in addition to the feature selection (reduction) process, which mainly refers to the removal of irrelevant features, modern biometric recognition systems based on gait also remove bad quality outliers. Bad quality outliers include outliers in one frame, outliers in datasets, outliers in one gait video, and outliers caused by cloths (Wan et al., 2018).

11 The filter-based approach.

12 It evaluates attribute sets using a learning scheme. Cross-validation is used to eestimate the accuracy of the learning scheme for a set of attributes.

13 Embedded methods combine the qualities of filters and wrapper methods. It is implemented by algorithms that have their own built-in feature selection methods

Classification

The classification procedure means a comparison of the collected and pre-processed features (through the feature collection, extraction and selection module) with the features collected in the databases. Distance, correlation, machine learning, the Hidden Markov model and Bayesian classification were used for the classification procedure (Rao, et al., 2021).

A distance-based classification method calculates the distances from collected gait data to the gait pattern in the database. The methods used to calculate differences include Euclidean distance,[14] Manhattan distance,[15] dynamic time warping (DTW) distance,[16] and the K-Nearest Neighbor (K-NN)[17] (Wan et al., 2018).

Correlation is a statistical relationship involving dependence, or the degree to which two variables move in coordination with each other. Studies have been conducted using Pearson's correlation coefficient (Khurelbaatar, Kim, Lee, & Kim, 2015).

Machine learning classifiers[18] use different algorithms for data processing, which include Support Vector Machine (SVM), Linear Discriminant Analysis (LDA), Decision Tree Ensemble Classifier (DTEC)[19], Neural Network Classifier,[20] and the so-called Deep Learning in Gait Recognition[21] (Wan et al., 2018).

Hidden Markov Model[22] is widely used in biometric gait recognition systems. Different variations of this algorithm have been used, such as Full Hidden Markov Models (FHMM) and Parallel Hidden Markov Models (PHMM) (Chen, Liang, Zhao, Hu, & Tian, 2009b).

14 The Euclidean distance between two points in the Euclidean space is defined as the length of the line segment between two points.

15 The Manhattan distance is a metric distance between two points in an N dimensional vector space. It is defined as the sum of the lengths of the projections of the line segment between the points on the coordinate axes. Simply put, it is the sum of absolute difference between coordinates of corresponding dimensions.

16 Dynamic time warping is an algorithm used to measure similarity between two sequences which may vary in time or speed.

17 K-NN is a non-parametric algorithm used for classification and regression.

18 Machine learning (ML) is a type of artificial intelligence (AI) that allows software applications to become more accurate at predicting outcomes without being explicitly programmed to do so. Machine learning algorithms use historical data as input to predict new output values.

19 Ensemble methods which combine several decision tree classifiers to produce better predictive performance than a single decision tree.

20 A neural network consists of units (neurons), arranged in layers, which convert an input vector into some output vector. Each unit takes an input, applies a (often non-linear) function to it and then passes the output on to the next layer.

21 Deep learning (also known as deep structured learning or hierarchical learning) is part of a broader family of machine learning methods based on data representation learning, as opposed to algorithms based on lists of commands.

22 A hidden Markov model (HMM) is a statistical Markov model in which the system being modeled is assumed to be a Markov process with unobservable (hidden) states.

The Bayesian classifier is based on the Bayesian Theorem,[23] which is used to calculate the probability that the processed characteristics match the data in the database (Bazin, & Nixon, 2005).

To evaluate and compare the efficiency of gait recognition systems, several specific databases have been developed for with different methods of collecting input data.

Table 3 shows the available databases used in the classification process of recognition systems based on input data collected by video cameras (Wan et al., 2018; Rao, et al., 2021; Makihara et al., 2021).

Table 3: Databases used in the classification process

Databases			
CMU MoBo	SOTON Temporal	OU-ISIR, Treadmill B	WOSG
Georgia Tech	USF HumanID	OU-ISIR, Treadmill C	AVA
HID-UMD	CASIA A	OU-ISIR, Treadmill D	AVAMVG
SOTON Small Database	CASIA B	OU-ISIR, LP	OU-ISIR MVLP
SOTON Large Database	CASIA C	TUM-IITKGP	NIST
SOTON Multimodal	OU-ISIR, Treadmill A	TUM-GAID	KY 4D

Databases used in the evaluation of biometric systems based on the input data collected through accelerometers are the Speed Dataset, the Motion-Recording-Sensor-Based Dataset, the Walking Pattern Dataset, the Android phone Google G1 Dataset, and the Human Activities and Postural Transitions Dataset (Wan et al., 2018).

A number of databases used in gait recognition systems based the input data collected through floor sensor have been presented and radar systems (Jenkins & Ellis, 2007; Middleton, Buss, Bazin, & Nixon, 2005).

CONCLUSION

Biometric gait recognition systems are novel systems characterized by intensive development with the application of appropriate information technologies. The advantages of these systems are reflected in the possible use of larger distances between the subject and the identification system, the use of several different simple recording devices with low resolution, recognition independent of the cooperation of the observed person, as well as a reduced possibility of imitating gait characteristics and masking movements. The development of software and hardware has enabled the application of complex mathematical algorithms, resulting in a high degree of reliability of the developed systems.

23 It describes the probability of an event, based on prior knowledge of the conditions that might be related to the event.

REFERENCES

Bazin, A, I, & Nixon, M, S. (2005). Probabilistic combination of static and dynamic gait features for verification. *Proceedings SPIE, Biometric Technology for Human Identification II,* 5779, 23–30.

Dikovski, B, Madjarov, G, & Gjorgjevikj, D. (2014). Evaluation of different feature sets for gait recognition using skeletal data from kinect, *37th International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO), Proceedings* (1304-1308). *Pujeка: Croatian Society for Information and Communication Technology, Electronics and Microelectronics – MIPRO.*

Derawi, M, & Bours, P. (2013). Gait and activity recognition using commercial phones. *Computers & Security, 39*(39), 137–144.

Jain, A, K, Ross, A, & Nandakumar, K. (2011). *Introduction to biometrics*. Boston: Springer.

Jenkins, J, & Ellis, C. (2007). Using ground reaction forces from gait analysis: Body mass as a weak biometric. 5th International Conference, PERVASIVE 2007, proceedings (251-267). Berlin, Heidelberg: Springer

Јовић, А, Бркић, К, & Богуновић, К. (2015). A review of feature selection methods with applications. *38th International Convention on Information and Communication Technology, Electronics and Microelectronics* (MIPRO), *Proceedings* (1200-1205). *Pujeка: Croatian Society for Information and Communication Technology, Electronics and Microelectronics – MIPRO.*

Kale, A, Sundaresan, A, Rajagopalan, A, N, Cuntoor, N, P, Roy-Chowdhury, A, K, Kruger, V, & Chellappa, R. (2004). Identification of humans using gait. *IEEE Transactions on Image Processing, 13(*9*),* 1163–1173.

Kastaniotis, D, Theodorakopoulos, I, Economou, G, & Fotopoulos, S. (2016). Gait based recognition via fusing information from euclidean and riemannian manifolds. *Pattern Recognition Letters*, *84*(1), 245–251.

Kim, D, & Paik, J. (2010). Gait recognition using active shapemodel andmotion prediction. *IET Computer Vision, 4*(1), 25–36.

Khoshelham, K. (2012). Accuracy analysis of kinect depth data. *ISPRS—International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, 3812*(5), 133–138.

Khurelbaatar, T, Kim, K, Lee, S, K, & Kim, Y, H. (2015). Consistent accuracy in whole-body joint kinetics during gait using wearable inertial motion sensors and in-shoe pressure sensors. *Gait & Posture, 42*(1), 65-69.

Lee, L, & Grimson, W, E, L. (2002). Gait analysis for recognition and classification. *5th IEEE International Conference on Automatic Face and Gesture Recognition, Proceedings (155–162).* New York: Institute of Electrical and Electronics Engineers.

Ly Quoc Ngoc, Vo Hoai Viet, Tran Thai Son, & Pham Minh Hoang. (2016). A Robust Approach for Action Recognition Based on Spatio-Temporal Features in RGB-D Sequences, *International Journal of Advanced Computer Science and Applications*, *7*(5), 166–177.

Makihara, Y, Nixon, M, S, & Yagi, Y. (2021). *Gait Recognition: Databases, Representations, and Applications*. Cham : Springer.

Man, J, & Bhanu, B. (2006). Individual recognition using gait energy image. *IEEE Transactions on Pattern Analysisand Machine Intelligence 28*(2), 316–322.

Mathivanan, B, & Perumal, P. (2021). Gait Recognition analysis for Human Identification Analysis-A Hybrid Deep Learning. Приступљено 20. 5. 2022. https://www.researchsquare.com/article/rs-549846/v1

Middleton, L, Buss, A, A, Bazin, A, & Nixon, M, S. (2005). A floor sensor system for gait recognition. *4th IEEE Workshop on Automatic Identification Advanced Technologies, Proceedings (171–176)*. New York: Institute of Electrical and Electronics Engineers.

Muro-de-la-Herran, A, Garcia-Zapirain, B, & Mendez-Zorrilla, A. (2014). Gait Analysis Methods: An Overview of Wearable and Non-Wearable Systems, Highlighting Clinical Applications. *Sensors*, *14*, 3362–3394.

Nakajima, K, Mizukami, Y, Tanaka, K, & Tamura, T. (2000). Footprint-based personal recognition. *IEEE Transactions on Biomedical Engineering 47*(11), 1534-1537.

Nixon, M, S, & Carter, J, N. (2004). Advances in automatic gait recognition. *6th IEEE International Conference on Automatic Face and Gesture Recognition, Proceedings (139–144).* New York: Institute of Electrical and Electronics Engineers.

Niyogi, S, A, & Adelson, E, H. (1994). Analyzing and recognizing walking figures in XYT. *IEEE Conference on Computer Vision and Pattern Recognition*, *Proceedings (469–474).* New York: Institute of Electrical and Electronics Engineers.

Orr, R, J, & Abowd, G, D. (2000). The smart floor: a mechanism for natural user identification and tracking. *CHI00: Human Factors in Computing Systems, Proceedings (275–276).* New York: Association for Computing Machinery.

Rao, P, S, Sahu, G, & Parida, P. (2021). Methods for Automatic Gait Recognition: A Review. *10th International Conference on Innovations in Bio-Inspired Computing and Applications (IBICA 2019), Proceedings (57-65).* Cham: Springer.

Sarkar, S, Jonathon Phillips, P, Liu, Z, Vega, I, R, Grother, P, & Bowyer, K, W. (2005). The human ID gait challenge problem: Data sets, performance, and analysis. *IEEE Transactions on Pattern Analysis and Machine Intelligence 27*(2), 162–177.

Santos, G, Tavares, T, & Rocha, A. (2022). Reliability and generalization of gait biometrics using 3D inertial sensor data and 3D optical system trajectories. *Scientific Reports*, *12*, 8414.

San-Segundo, R, Cordoba, R, Ferreiros, J, & D'Haro-Enriquez, L, F. (2016). Frequency features and GMMUBM approach for gait-based person identification using smartphone inertial signals. *Pattern Recognition Letters, 73*(C), 60–67.

San-Segundo, R, Echeverry-Correa, J, D, Salamea-Palacios, C, Lutfi, S, L, & Pardo, J, M. (2017). I-vector analysis for gait-based person identification using smartphone inertial signals. *Pervasive & Mobile Computing, 38*(38), 140–153.

Semwal, V, B, Gaud, N, Lalwani, P, Bijalwan, V, & Alok, A, K. (2022). Pattern identification of different human joints for different human walking styles using inertial measurement unit (IMU) sensor. *Artificial Intelligence Review, 55,* 1149-1169.

Suutala, J, & Röning, J. (2004). Towards the adaptive identification of walkers: Automated feature selection of footsteps using distinction-sensitive LVQ. *International Workshop on Processing Sensory Information for Proactive Systems (PSIPS'04), Proceedings (61-67).* Oulu: University of Oulu.

Sun, J, Wang, Y, & Li, J. (2017). Gait Recognition. In Carlos Travieso-Gonzalez, C. (Ed), *Motion Tracking and Gesture Recognition* (pp.143-164). London,UK: IntechOpen Limited.

Takemura, N, Makihara, Y, Muramatsu, D, Echigo, T, & Yagi, Y. (2018). Multi-view large population gait dataset and its performance evaluation for cross-view gait recognition. *IPSJ Transactions on Computer Vision and Applications*, *10*(4), 1-14.

Troje, N, F. (2002). Decomposing biological motion: A framework for analysis and synthesis of human gait patterns. *Journal of Vision, 2*, 371–387.

Fan, Z, Jiang, J, Weng, Sh, He, Z. & Liu, Z. (2016). Human gait recognition based on discretecosine transform and linear discriminant analysis. *2016 IEEE International Conference on Signal Processing, Communications and Computing (ICSPCC),* Proceedings *(1-6).* New York: Institute of Electrical and Electronics Engineers.

Cutting, J, E, & Kozlowski, L, T. (1977). Recognizing friends by their walk: Gait perception without familiarity cues. *Bulletin of Psychonomic Society, 9*(5), 353–356.

Chen, Ch, Liang, J, Zhao, H, Hu, H, & Tian, J. (2009a). Frame difference energy image for gait recognition with incomplete silhouettes. *Pattern Recognition Letters, 30*(11), 977–984.

Chen, Ch, Liang, J, Zhao, H, Hu, H, & Tian, J. (2009b). Factorial HMM and parallel HMM forgait recognition. *IEEE Transactions on Systems, Man, and Cybernetics, Part C (Applications and Reviews), 39*(1), 114–123.

Wang, L, Ning, H, Tan, T, & Hu, W. (2004). Fusion of static and dynamic body biometrics forgait recognition. *IEEE Transactions on Circuits & Systems for Video Technology, 14*(2), 149–158.

Wan, CH, Wang, L, & Phoha, V, V, A. (2018). A Survey on Gait Recognition. *ACM Computing Surveys, 51*(5), 1-35.

Whittle, M, W. (2007). *Gait Analysis an Introduction*. Michigan, USA: Butterworth-Heinemann

Yamada, H, Ahn, J, Mozos, O, M., Iwashita, Y, & Kurazume, R. (2020). Gait-based person identification using 3D LiDAR and long short-term memory deep networks. *Advanced Robotics, 34*(18), 1201–1211.

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PSYCHOSOCIAL SUPPORT BY RESCUERS AND VOLUNTEERS IN THE CIRCUMSTANCES OF NATURAL DISASTERS

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Abstract: The potential of natural disasters to cause direct and indirect damage to human health is great. Recognizing the hazards of natural disasters and effective disaster risk management at the national and local levels, as well as a focus on preventive action, are necessary. The efforts of rescue teams (professionals) and volunteers (nonprofessionals) who provide psychosocial assistance in the circumstances of natural disasters should be aimed at re-establishing a satisfactory and acceptable physical, mental, psychological, social and economic condition of the individuals and the community. However, severe events have consequences for the mental health of rescuers and volunteers. Preparing rescuers and volunteers is the initial support activity. Maintaining the psychological well-being of rescuers and volunteers is also achieved through self-care activities. According to the guidelines of the Reference Center for Psychosocial Support, in order to ensure continuous maintenance of the psychological well-being of rescuers and volunteers, the organization that hires them must carry out support activities prior, during and after the response to the accident. In this regard, the way of treatment of rescuers engaged in the protection and rescue system was analyzed.

Keywords: rescuers, volunteers, psychosocial support/assistance, natural disasters

INTRODUCTION

At the global level, the international community's interest in the psychological and social impact of natural disasters on people has increased. This is evidenced by frequent international conferences whose theme is support and increasing care for mental health, such as last the 2019 Amsterdam conference. The promotion of health resilience is defined as one of the priorities in the

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Sendai framework, [2] where health is one of the key elements. As final products, guidelines and manuals have been published regarding the provision of psychosocial assistance after major accidents and disasters, which are intended for both crisis management employees and volunteers (Bisson, & Tavako, 2008; TENTS, 2009; TENTS, 2011a; TENTS, 2011b; Meyer, 2013; Welton-Mitchell, 2013; Todorović et al., 2018).

The diverse approach to the provision of psychosocial assistance at national levels is being overcome by the formation of coordination networks. The Reference Center of the International Federation of Red Cross and Red Crescent Societies and the Reference Group of the Inter-agency Standing Committee on Mental Health and Psychosocial Support of the UN are leading international organizations that raise the standard of care for the population affected by a disaster in the field of mental health and organized provision of psychosocial assistance. The issue of psychosocial assistance to the population affected by a natural disaster is exclusively addressed at the global level in the existing scientific literature. Several scientists have published research results and conclusions (Seynaeve, 2001; Wessells & Van Ommeren, 2008; Allden, et al., 2009; Kramer, 2009; Birkmann et al., 2010; Knowles, 2013; Gagliato, Hijazi & Blaauw, 2017). In addition, the most representative examples of research summaries and conclusions are manuals or guidelines on mental health and psychosocial support in emergencies, which are not binding (IASC, 2007; IASC, 2008; IFRC, 2009; IASC & IASC RG MHPSS, 2010; Sphere Association, 2018).

PROFESSIONALS AND NONPROFESSIONALS AND PSYCHOLOGICAL ASSISTANCE IN NATURAL DISASTERS

By accepting the Sendai framework, Republika Srpska is determined to reduce disaster risks through its institutional action and to reduce losses and resources for the life and health of the population of Republika Srpska. The degree of functionality of the system for the provision of psychosocial assistance in the circumstances of natural disasters is reflected in the ability of rescuers and volunteers to provide the best possible psychosocial assistance and support to those who need help in the circumstances of natural disasters. Previously

2 The current document for global action The Sendai Framework for Disaster Risk Reduction 2015–2030 (UNISDR, 2015) was adopted on March, 2015, at the Third UN World Conference on Disaster Risk Reduction, which was held in Sendai (Japan). By adopting *the Sendai Framework for Disaster Risk Reduction 2015-2030*. the global framework for disaster risk prevention and reduction has been strengthened. An international response to challenges was determined and coordinated, and multilateral international treaties and resolutions were adopted. The consequences of the above are the initiatives that influence the change of national legislation. By referring to health, as many as 39 times, health is presented as one of the key elements of the *Sendai Framework*. Out of a total of seven global goals, four have direct links to health and focus on mortality reduction, population well-being, early warning and promoting health system resilience (Reifels, 2018). In Priority 4, mental health is defined as a responsibility at national/local levels with a clear goal – *To enhance recovery schemes to provide psychosocial support and mental health services for all people in need*.

published studies have mainly focused on the psychological impact of disasters on survivors. However, many recent studies have focused on rescuers. Rescuers are individuals who provide assistance to people in emergencies such as a disaster (Sifaki-Pistolla, Chatzea, Vlachaki, Melidoniotis, & Pistolla, 2017). These are professionals such as firefighters, police officers, military personnel/soldiers, and rescuers in the health system and nonprofessional volunteers who help victims affected by various disasters, provide acute medical care and transport them to facilities where they can receive more adequate care (Berger et al., 2012).

Three typical responses of this group of people to danger are mentioned in the literature: the development of burnout syndrome, countertransference reactions, and indirect/secondary traumatization of rescuers and helpers (Vlajković, 2009). The burnout syndrome most often develops in those rescuers and helpers who strive for perfectionism, idealization of the work they do, complete devotion to work, excessive expectations. The self-image of these helpers and rescuers has been described as the "superman syndrome". Poor work organization, lack of training for a job, lack of social support or supervision, and professional isolation also help the burnout syndrome to develop faster (Van der Veer, 1992). Countertransference reactions represent a phenomenon in which the helper's feelings and thoughts are stimulated by the client's experience that he communicates to the helper. The dramatic stories that the helper listens to can contribute to the awakening of various defense mechanisms (suppression, denial, projection) that can threaten the provision of psychological help to victims. The term indirect or secondary traumatization of rescuers and helpers is used to mean the traumas that these categories of people experience while working with traumatized people (Figley, 1995).

Due to the nature of their job, rescuers always encounter severely injured people or dead bodies and witness survivors' emotional reactions (hopelessness, sadness, and anger), they experience disappointment when they fail to save a life and expose themselves to potential physical harm (Mao, Fung, Hu, & Loke Yuen, 2018). All of these stressors may increase the likelihood of negative psychological outcomes among rescuers, compared to the general population who are not exposed to a disaster (Van der Velden, Van Loon, Benight & Eckhardt, 2012; Walker, McKune, Ferguson, Pyne & Rattray, 2016). The negative psychological impact of a disaster on rescue workers includes acute distress disorder, anxiety and depression, post-traumatic stress disorder (PTSD), and addiction/substance use disorders (Pinto, Henriques, Jongenelen, Carvalho & Maia, 2015; Javidi, & Yadollahie, 2012). The severity of the helper's traumatic experience, the level of his/her training, the impossibility of using different sources of psychosocial support and the current psychological and physical health of the helper favor the development of secondary traumatization of te helper (Vlajković, 2009: 76).

The engagement of nonprofessionals (volunteers) in the remediation of the psychological consequences of accidents is another common denomina-

tor that unites different forms of psychological assistance. The involvement of non-professionals in the provision of services in the field of mental health raises two key issues – the issue of the selection of nonprofessionals and the issue of their education. Regarding selection, Goodman (Goodman, 1972:953) talks about interpersonal sensitivity, understanding, openness, modesty, acceptance/warmth and therapeutic talent, as the basic criteria for the selection of nonprofessionals. Furthermore, the education of nonprofessionals is not based on psychotherapy, psychological or psychiatric treatment. According to the Red Cross of Serbia (2018), psychological education should be adapted to the needs of the vulnerable population and includes giving information to vulnerable people and groups about the nature of stress, post-traumatic stress and other reactions and familiarizing them with coping mechanisms, skills and resources. Volunteers should have knowledge and understanding of crisis response and skills to help people cope with their problems. Also, it is very important to encourage nonprofessionals to develop group solidarity, group identity and support of their own group, because this is the only they can avoid the need to imitate professionals.

Through the action of specialized and volunteer forces, appropriate measures and activities are implemented, which contributes to the systematic and effective provision of psychosocial assistance in the circumstances of natural disasters during all three stages of disaster risk management (before, during and after a natural disaster). In this regard, it was analyzed to what extent rescuers and volunteers in Republika Srpska are trained to provide psychological first aid to people affected by natural disasters, given that there is no continuous education and training of rescuers and volunteers to provide psychological first aid.

Plans and guidelines for providing psychosocial support to engaged rescue teams have not been created or developed for all three stages of disaster management. The assistance provision program and the treatment of engaged members of the rescue teams and volunteers is not at the recommended level in relation to the guidelines of the reference centers. In order to verify the aforementioned hypotheses, it was examined to what extent an appropriate psychosocial assistance program intended exclusively for rescuers during the disaster management stages is implemented among the members of the rescue teams, since they are not immune to psychosocial effects of a disaster.

METHODOLOGICAL FRAMEWORK

This paper presents part of the findings of a larger research project (Marčeta, 2021), which was carried out in order to determine the level of preparedness of the institutions in Republika Srpska in relation to the provision of psychosocial assistance (experience and achievements) in the circumstances of natural disasters. Here, the current functioning of the system for the provision of psy-

chosocial assistance to the population by rescue teams in the circumstances of natural disasters in Republika Srpska was examined.

Research sample

The sample of respondents in this research consisted of members of the protection and rescue forces from the cities of Banja Luka and Gradiška and the municipalities of Čelinac, Laktaši, and Kozarska Dubica, who were engaged during the floods in 2010 and 2014 in Republika Srpska. The research was conducted on a sample of 62 respondents, from August to October 2020. The deliberate sample consisted of rescuers who were engaged in the mentioned period as part of the civil protection units and teams formed by the authorities of local government units, the competent organizational unit of the Ministry of the Interior, including members of the professional and emergency services (firefighters and medical services) and Red Cross teams of Republika Srpska. Sociodemographic characteristics of this sample are presented below.

The ratio between male and female respondents in the sample is 1:2.1 in favor of the males, which represents a realistic picture of gender equality of employees in the surveyed work organizations of public institutions of Republika Srpska. Male respondents made up 67.74% (42 of them) of the total sample, while 32.26% (20 of them) were females.

Regarding the age of the respondents, it corresponds to a normal distribution. A largest number of respondents, 25 (40.32%), belong to 40–49 age group, while other age groups are evenly distributed: three respondents (4.84) belong to 19–29 age group, while 16 of them (25.81 %) to 30–39 age group. Thirteen respondents (20.97%) are 50–59 years old, while 5 of them (8.06%) make up the category of the oldest respondents aged 60–65.

The structure of respondents by their educational background can be presented as follows: the largest number of respondents, 30 of them (48.39%), have a university degree, while 21 respondents (33.87%) have secondary education. Five respondents (8.06%) have higher education, while three respondents (4.84%) are specialists. Two respondents (3.23%) have magister's degrees, while one respondent (1.61%) has a master's degree.

Data on the respondents who make up this sample based on work and employment in work organizations[3] of public institutions of Republika Srpska indicate that 11 respondents (17.74%) are employed in the Ministry of the Inte-

3 It was planned to carry out the research on a sample of 66 respondents, who were engaged during the floods in 2010 and 2014 as part of the civil protection units and teams formed by the authorities of the local government units, the competent organizational unit of the Ministry of the Interior, members of professional and emergency services (firefighters and medical services), and units, teams and crews of the Red Cross of Republika Srpska, which was formed on the basis of a deliberate sample of 11 respondents from each work organization. The planned sample of 11 respondents from the Civil Protection Administration of Republika Srpska (RUCZ RS) was not reached, consid-

rior, Local Government Units, Fire Service, Emergency Service and Red Cross, while 7 of them (11.29%) are employed in the Civil Protection Administration.

Regarding the structure of respondents by the respondent's city/place of work,[4] out of a total of 62 respondents in this sample, 16 of them (25.81%) are employed in Banja Luka, while 12 of them (19.35%) are, on the same basis, from Čelinac, Gradiška and Kozarska Dubica. Ten respondents (16.13%) are employed in Laktaši.

The largest number of respondents, 21 of them (33.87%), have 11 to 20 years of work experience, while 20 respondents (32.26%) have 21 to 30 years of work experience. Thirteen respondents (20.97%), on the basis of work experience, fall into the category of 6 to 10 years, while eight (12.90%) fall into the category of 31 to 40 years. In this sample, there are no respondents with less than five years of work experience, given that the intentional sample included people engaged during the floods of 2010 and 2014. Using the survey technique, research was conducted on a sample of respondents who were members of the protection and rescue forces.

In order to test the hypotheses, data were collected using a survey questionnaire on the described sample of members of the protection and rescue forces who were engaged during the floods in 2010 and 2014 in Republika Srpska. The study was conducted on a sample of 62 respondents between August and October, 2020.

RESEARCH FINDINGS

Below are presented research finding on a sample of members of the rescue teams from the cities of Banja Luka and Gradiška and the municipalities of Čelinac, Laktaši and Kozarska Dubica, who were engaged during the floods in 2010 and 2014 in Republika Srpska.

ering that in the RUCZ RS of the city of Banja Luka only one respondent responded to the survey out of the planned three, while the municipality of Laktaši does not have elements of the RUCZ RS.

4 It was planned to carry out the research on a sample of 66 respondents - members of the protection and rescue forces from the cities of Banja Luka and Gradiška and the municipalities of Čelinac, Laktaši and Kozarska Dubica, who were engaged during the floods in 2010 and 2014 in Republika Srpska. The group of respondents was formed on the basis of a deliberate sample, 18 respondents from the city of Banja Luka and 12 respondents from the city of Gradiška and the municipalities of Čelinac, Laktaši and Kozarska Dubica. The planned sample of 18 respondents from the city of Banja Luka was not reached, given that only one of the three respondents from the RUCZ RS Banja Luka responded to the survey, while the municipality of Laktaši does not have elements of RUCZ

Table 1: Question Q1 - Organizing entities and society and the implementation of measures and activities in the work organization through three stages of disaster risk management

Q1	In my work organization, in order to protect national security, the task of organizing of entities and society is undertaken through three stages of disaster risk management, and appropriate measures and activities are implemented before, during and after a natural disaster.	Number	%
	Completely yes	23	*37,10*
	Mostly yes	22	*35,48*
	Partially	13	*20,97*
	Mostly no	2	*3,23*
	Not at all	0	*0,00*
	I don't know	2	*3,23*
TOTAL		62	*100*

Table 2: Question Q2 – Ways of overcoming stress

Q2	In the course of my employment, I have been in stressful situations. I have overcome stress:	Number	%
	By myself (self-help)	18	*29,03*
	With the help of a work colleague/colleagues	11	*17,74*
	With the help of the family	3	*4,84*
	With the help of religion	0	*0,00*
	I have not been in stressful situations	4	*6,45*
	Something else	0	*0,00*
	Multiple responses	24	*38,71*
TOTAL		62	*100*

Overcoming stress with the help of religion was not noted as an individual response among the respondents. However, 24 respondents (38.71%) state this style of overcoming stress in combination with other ways of overcoming stress, for example, by myself (self-help and with the help of family).

Table 3: Question Q3 - Ways to overcome stress caused by performing daily tasks

Q3	Performance of my daily tasks (contact with people who have lost their loved ones, their homes and/or livelihood; or who have had traumatic and difficult experiences) affects me so that:	Number	%
	I have learned to live with it	31	*50,00*
	I try to look for emotional support from family, friends or relatives	3	*4,84*
	I find other activities to redirect my thoughts and distract my mind	8	*12,90*
	I try to find solace in religion	2	*3,23*
	I sleep longer than usual	1	*1,61*
	I constantly have physical and mental problems and I worry about my health	1	*1,61*
	Multiple answers	16	*25,81*
TOTAL		62	*100*

Sixteen respondents (25.81%) use different ways of overcoming stress caused by daily work (contact with people who have lost their loved ones, their homes and/or livelihood or who have had traumatic and difficult experiences). The stress caused by performing daily tasks was mostly overcome by learning to live with it and find other activities to redirect their thoughts and distract their mind – six respondents (37.50%).

Table 4: Question Q 4 - Implementation of training related to overcoming stressful situations

Q4	In my work organization, training related to overcoming stressful situations is conducted in the following way:	Number	%
	Peer support based on the "older brother/sister" model	3	*4,84*
	Psychological education	22	*35,48*
	Peer support group meetings	1	*1,61*
	Training is not conducted	35	*56,45*
	No answer	1	*1,61*
TOTAL		62	*100*

Table 5: Question Q5 - Frequency of conducting training related to overcoming stressful situations

Q5	In my work organization, training related to overcoming stressful situations is conducted:	Number	%
	Several times a month	2	*3,23*
	Once a month	1	*1,61*
	Quarterly (once every quarter of a year)	2	*3,23*
	Twice a year	10	*16,13*
	Once a year	12	*19,35*
	Training is not conducted	35	*56,45*
TOTAL		62	*100*

Table 6: Question Q6 - Training in providing psychological first aid

Q6	In my work organization, training is conducted in providing psychological first aid to the affected population, in which I am being trained how to:	Number	%
	Assess the state of mental health of the victim	0	*0,00*
	Provide the victims with the necessary information	0	*0,00*
	Establish communication with the victim	3	*4,84*
	Provide first aid	3	*4,84*
	Convince the victim to act according to my instructions for the purpose of rescue	0	*0,00*
	Assess the victim's physical injuries	0	*0,00*
	Recognize the individual needs of the victim	0	*0,00*
	Help calm down the victim's stress reactions	0	*0,00*
	Get necessary information from the victim in order to rescue	0	*0,00*
	Training is not conducted	28	*45,16*
	Multiple answers	28	*45,16*
TOTAL		62	*100*

Twenty-eight respondents (45.16%) believe that, in their work organization, multiple training is conducted in providing psychological first aid to the affected population (they list two to all nine methods of providing psychological first aid).

Table 7: Question Q7 - Frequency of conducting psychological first aid training

Q7	In my work organization, training in providing psychological first aid to the affected population is conducted:	Number	%
	Several times a month	3	*4,84*
	Once a month	1	*1,61*
	Quarterly (once every quarter of a year)	0	*0,00*
	Twice a year	13	*20,97*
	Once a year	16	*25,81*
	Training is not conducted	29	*46,77*
TOTAL		62	*100*

Table 8: Question Q8 - Outcomes of the training in providing psychological first aid

Q8	Through the training in providing psychological first aid to the affected population, I am prepared for the situations in which:	Number	%
	The victim is in a state of shock	2	*3,23*
	The victim refuses to communicate	1	*1,61*
	The victim cannot meet fundamental needs	2	*3,23*
	The victim behaves aggressively	1	*1,61*
	The victim receives assistance	1	*1,61*
	Training is not conducted	29	*46,77*
	Multiple answers	26	*41,94*
TOTAL		62	*100*

Twenty-six (41.94%) respondents, as their answers, combined two to five different situations for which they were prepared through the training in providing psychological first aid to the affected population. Only five respondents (19.23%) of these 26 gave an answer that corresponded to the guidelines of the European Network for Traumatic Stress (TENTS). In accordance with the TENTS guidelines, it is recommended to train and prepare helpers to act according to the responses of the victims to the trauma and how they deal with it.[5]

Table 9: Question Q 9 - Acquired skills in providing psychological first aid

Q9	Through the training of providing psychological first aid to the affected population, I have acquired the following skills:	Number	%
	Recognizing physical signs of the victim's distress (does not respond to questions or commands, disorientation, hyperventilation)	0	0,00
	Assessing the level of victim resistance (assessing whether help is needed or encouraging self-help is sufficient)	0	0,00
	Establishing a good psychological atmosphere in which communication with the victim takes place smoothly	1	1,61
	Establishing non-verbal communication with the victim	0	0,00
	Gathering information about the needs of the victim	0	0,00
	Providing practical help	1	1,61
	Recognizing the victim's emotional signs of distress (uncontrollable crying, physical/verbal aggression, shock)	1	1,61
	Emotional calming of the victim with the grounding technique	1	1,61
	Recognizing the need for the referral of the victim to specialist services	0	0,00
	Teaching the victims the ways to cope with difficulties (psycho-education)	1	1,61
	Assessment of danger to self and others	0	0,00
	I had no training	29	46,77
	Multiple answers	28	45,16
TOTAL		62	100

Twenty-eight (45.16%) respondents, as their answer to this question, combined three to nine different skills they have acquired in providing psychological first aid. The analyzed data indicate that none of the respondents possess all the skills[6] recommended by the TENTS guidelines.

5 In accordance with the TENTS guidelines, which are not binding in nature, psychosocial assistance to emergency services personnel/rescuers and spontaneous volunteers in the general assistance model foresees the planning of procedures that will help prevent burnout and traumatization. These procedures include: 1) regular shifts (so that people do not work longer than necessary); 2) technical debriefing after the end of the shift; 3) support systems. Support systems include regular supervision, consultation with colleagues and external advisors, and techniques for building a collective spirit aimed at unity and support in the team (Bisson & Tavako, 2008).

6 According to the recommendations, the basic skills that rescuers must possess are the assessment of danger to themselves and others. Then communication skills through which information is gathered about the needs of the victim in order to provide practical help. Possessing skills such as

Table 10: Question Q 10 - Relationship between training and challenge

Q10	The training in my work organization corresponds to the challenges I faced during the floods in 2010 and 2014.	Number	%
	Completely yes	6	*9,68*
	Mostly yes	28	*45,16*
	Partially	18	*29,03*
	Mostly no	3	*4,84*
	Not at all	6	*9,68*
	I wasn't engaged	0	*0,00*
	No answer	1	*1,61*
TOTAL		62	*100*

Table 11: Question Q 11 – Introducing new topics into the training process

Q11	After the floods in 2010 and 2014, the topics that had not been implemented until then were introduced into the training process.	Number	%
	Yes	14	*22,58*
	Partially	23	*37,10*
	No	6	*9,68*
	I don't know	18	*29,03*
	No answer	1	*1,61*
TOTAL		62	*100*

Table 12: Question Q12 - Compliance of the training program with the guidelines of the reference centers

Q12	To what extent the training programs are in line with the guidelines of the reference centers:	Number	%
	Completely	8	*12,90*
	Partially	23	*37,10*
	They are not in line	8	*12,90*
	I don't know	22	*35,48*
	No answer	1	*1,61*
TOTAL		62	*100*

recognizing physical and emotional signs of the victim's distress, assessing the victim's resistance level and recognizing the need to refer the victim to specialist services helps in preventive action and early detection of more serious psychological disorders.

Table 13: Question Q 13 - The need for training of rescuers and volunteers in providing psychological first aid to the affected population

Q13	In my opinion, in my work organization, there is a need to train rescuers and volunteers in providing psychological first aid to the affected population.	Number	%
	Yes	38	*61,29*
	Partially	9	*14,52*
	No	9	*14,52*
	I don't know	5	*8,06*
	No answer	1	*1,61*
TOTAL		62	*100*

CONCLUSION

Our study determined that work organizations implement measures and activities before, during and after a natural disaster and organize entities and society in three stages of disaster risk management. The prevailing view is that the planned and implemented training corresponds to the challenges they faced during the floods. Thus, a third of the members of the rescue forces believe that they have appropriate training which is partially in line with the reference centers. However, our study demonstrates that work organizations do not implement an appropriate program for psychosocial assistance intended exclusively for rescuers during all stages of natural disaster management and that no training is conducted in relation to overcoming stressful situations.

In addition, there is no systematic approach in work organizations regarding the education of helpers with clearly defined outcomes and goals, that is, the skills that trainees should acquire. The employees do not possess abilities and skills prescribed by the reference center, since there is no continuous education and training of rescuers and volunteers for providing psychological first aid. The findings of this study indicate that the need to establish a program of education and training of rescuers and volunteers in providing psychological first aid prevails among the respondents.

The findings of this study should be indicators in finding practical solutions in natural disaster management in all three key stages, by including the activities related to the provision of psychosocial assistance in the planning and implementation of preparedness measures, immediate response measures and quick response and recovery measures. The social justification of this research is reflected in the assessment of the preparedness of the rescue teams to respond to the needs of the vulnerable population in an organized and functional manner within the framework of the psychosocial support system. Therefore, it is important that helpers become aware of their own emotional reactions and learn to use them when providing psychological assistance.

REFERENCES

Allden, K., Jones, L., Weissbecker, I., Wessells, M., Bolton, P., Betancourt, T., Hijazi, Z., Galappatti, A., Yamout, R., Patel, P. & Sumathipala, A. (2009). Mental Health and Psychosocial Support in Crisis and Conflict: Report of the Mental Health Working Group. *Prehospital and Disaster Medicine, 24*(2), 217–227.

Amsterdam Conference Declaration. (2019). *Amsterdam Conference.* Retrieved 29. 2. 2020. from Government of the Netherland: https://www.government.nl/ministries/ministry-of-foreign-affairs/documents/diplomatic-statements/2019/10/08/amsterdam-conference-declaration

Berger, W., Coutinho, E. S., Figueira, I., Marques-Portella, C., Luz, M. P., Neylan, T. C., Marmar, C. R., & Mendlowicz, M. V. (2012). Rescuers at risk: a systematic review and meta-regression analysis of the worldwide current prevalence and correlates of PTSD in rescue workers. *Social psychiatry and psychiatric epidemiology, 47*(6), 1001–1011.

Birkmann, J. & Buckle, P. & Jaeger, J. & Pelling, M., Setiadi, N., Garschagen, M., Fernando, N. & Kropp, J. (2010). Extreme events and disasters: A window of opportunity for change? Analysis of organizational, institutional and political changes, formal and informal responses after mega-disasters. Natural Hazards: *Journal of the International Society for the Prevention and Mitigation of Natural Hazards*, *55*(3), 637–655. doi: 10.1007/s11069-008-9319-2

Bisson, J., & Tavako, B. (2008). *The TENTS Guidelines for psychosocial care following disasters and major incidents*. United Kingdom: Cardiff University, Wales. Retrieved 29.2.2020. from European Society for Traumatic Stress Studies: https://www.estss.org/uploads/2011/04/TENTS-Full-guidelines.pdf

Figley, C. R. (1995). Compassion fatigue as secondary traumatic stress disorder: An overview. In C. R. Figley (Ed.), *Compassion fatigue: Coping with secondary traumatic stress disorder in those who treat the traumatized* (1–20). New York: Brunner/Mazel.

Gagliato, M., Hijazi , Z., & Blaauw, M. (2017). *MHPSS Emergency Toolkit.* Retrieved 2.3.2020. from The Mental Health & Psychosocial Support Network: https://app.mhpss.net/images/2019_MHPSS_toolkit.pdf

Goodman, G. (1972). Systematic selection of psychotherapeutic talent: group assessment of interpersonal traits. In S.E. Golann and C. Eisdorfer (Eds.), *Handbook Of Community Mental Health* (939–956). New York: Appleton-Century- Crofts.

IASC & IASC RG MHPSS (2010). *Mental Health and Psychosocial Support in Emergency Settings: What should Protection Programme Managers Know?* Switzerland, Geneva: IASC. Retrieved 2.3.2020. from United Nations – OCHA Services – The Inter-Agency Standing Committee: https://interagencystandingcommittee.org/system/files/legacy_files/MHPSS%20Protection%20Actors.pdf

IASC (2007). *IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings.* Switzerland, Geneva: IASC. Retrieved 2.3.2020. from United Nations – OCHA Services – The Inter-Agency Standing Committee: https://interagency-

standingcommittee.org/system/files/iasc_guidelines_on_mental_health_and_psychosocial_support_in_emergency_settings.pdf

IASC (2008). *Mental Health and Psychosocial Support in Emergency Settings - Checklist for Field Use.* Switzerland, Geneva: IASC. Retrieved 2.3.2020. from United Nations – OCHA Services – The Inter-Agency Standing Committee: https://interagencystandingcommittee.org/system/files/legacy_files/Checklist%20for%20field%20use%20IASC%20MHPSS.pdf

IFRC, Reference Centre for Psychosocial Support. (2009). *Psychosocial interventions: A handbook.* Copenhagen: International Federation Reference Centre for Psychosocial Support.

Javidi, H., & Yadollahie, M. (2012). Post-traumatic Stress Disorder. *The International Journal of Occupational and Environmental Medicine, 3*(1), 2–9.

Knowles, S. G. (2013). *The disaster experts: Mastering risk in modern America.* Philadelphia: University of Pennsylvania Press.

Kramer, W. M. (2009). *Disaster planning and control.* Tulsa: Penn Well.

Mao, X., Fung, W. M. O., Hu, X., & Loke Yuen, J. T. A. (2018). Psychological impacts of disaster on rescue workers: A review of the literature. *International Journal of Disaster Risk Reduction*, *27*, 602–617. https://doi.org/10.1016/j.ijdrr.2017.10.020

Meyer, S. (2013). *UNHCR's Mental Health And Psychosocial Support: For Persons Of Concern.* Switzerland, Geneva: UNHCR. Retrieved 20.3.2020. from The UN Refugee Agency – UNHCR: https://www.unhcr.org/research/evalreports/51bec3359/unhcrs-mental-health-psychosocial-support-persons-concern.html

Pinto, R. J., Henriques, S. P., Jongenelen, I., Carvalho, C. & Maia, Â. C. (2015). The strongest correlates of PTSD for firefighters: number, recency, frequency, or perceived threat of traumatic events? *Journal of Traumatic Stress, 28*(5), 434–440. doi: 10.1002/jts.22035.

Seynaeve, G. J. R (2001). European Policy Paper: Psychosocial support in situations of mass emergency. European Policy Paper concerning different aspects of psychological support and social accompaniment for people involved in major accidents and disasters. Retrieved 9.4.2020. from Stadt Wien: https://www.wien.gv.at/menschen/sicherheit/krisenmanagement/pdf/mass-emergency.pdf

Sifaki-Pistolla, D., Chatzea, V. E., Vlachaki, S.A. Melidoniotis, E. & Pistolla G. (2017). Who is going to rescue the rescuers? Post-traumatic stress disorder among rescue workers operating in Greece during the European refugee crisis. *Social Psychiatry and Psychiatric Epidemiology, 52*, 45–54. https://doi.org/10.1007/s00127-016-1302-8

Sphere Association. (2018). *The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response* (4th edition). Switzerland, Geneva: Sphere Association. Retrieved 9.4.2020. from spherestandards.org: https://spherestandards.org/wp-content/uploads/Sphere-Handbook-2018-EN.pdf

TENTS. (2009). (The European Network for Traumatic Stress). *Интервенције после великих несрећа и катастрофа.* Amsterdam: Academic Medical Center Uni-

versity of Amsterdam. Retrieved 29.2.2020. from European Society for Traumatic Stress Studies: https://www.estss.org/uploads/2011/04/serbian-booklet.pdf

TENTS. (2011a). (The European Network for Traumatic Stress). *Модел пружања психосоцијалне помоћи после великих несрећа и катастрофа*. Retreived 29.2.2020. from European Society for Traumatic Stress Studies: https://www.estss.org/uploads/2011/04/78Translation_Serbian_-_model_of_care_FINAL.pdf

TENTS. (2011b). (The European Network for Traumatic Stress). *Смернице за пружање психосоцијалне помоћи после великих несрећа и катастрофа*. Retrieved 29.2.2020. from European Society for Traumatic Stress Studies: https://www.estss.org/uploads/2011/04/serbian-full-guidelines.pdf

The United Nations Office for Disaster Risk Reduction, UNISDR. (2015). *Sendai Framework for Disaster Risk Reduction 2015-2030.* Switzerland, Geneva: UNISDR. Retrieved 9.4.2020. from preventionweb.net – managed by the UN Office for Disaster Risk Reduction (UNDRR): https://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf

Van der Veer, G. (1992). *Counseling and therapy with refugees: Psychological problems of victims of war, torture and repression*. Chichester: John Wiley.

Van der Velden, P. G., Van Loon, P., Benight, C. C., & Eckhardt, T. (2012). Mental health problems among search and rescue workers deployed in the Haiti earthquake 2010: a pre-post comparison*, Psychiatry Research, 198* (1), 100–105. doi: 10.1016/j.psychres.2012.02.017.

Walker, A., McKune, A., Ferguson, S., Pyne, D. B. & Rattray, B. (2016). Chronic occupational exposures can influence the rate of PTSD and depressive disorders in first responders and military personnel. *Extreme Physiology & Medicine, 5* (8), 1– 12. doi:10.1186/s13728-016-0049-x

Welton-Mitchell, C. E. (2013). *UNHCR's Mental Health And Psychosocial Support: For Staff*. Switzerland, Geneva: UNHCR. Retrieved 20.3.2020. from The UN Refugee Agency – UNHCR: https://www.unhcr.org/research/evalreports/51f67bdc9/unhcrs-mental-health-psychosocial-support-staff.html

Wessells, M. G., & Van Ommeren, M. (2008). Developing inter-agency guidelines on mental health and psychosocial support in emergency settings. *Intervention: International Journal of Mental Health, Psychosocial Work & Counselling in Areas of Armed Conflict, 6*(3–4), 199–218.

Марчета, Ж. (2021). Психосоцијална помоћ у околностима природних катастрофа. Мастер рад. Бања Лука: Универзитет у Бањој Луци, Факултет безбједносних наука.

Тодоровић, Н., Врачевић, М., Риц Рихтер, Л., Богдановић, Н., Милићевић Калашић, А., Милорадовић, С., Јанковић, Б. (Ур.). (2018). Психосоцијална подршка у несрећама. Приручник за професионалце и волонтере Црвеног крста Србије. Београд: Црвени крст Србије.

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SELF – ASSESSMENT OF MOTOR SKILLS BY THE STUDENTS AT THE FACULTY OF SECURITY STUDIES IN BANJA LUKA

Original Scientific Article

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Abstract: The research sample consisted of 43 first-year male students at the Faculty of Security Studies Banja Luka. This study was conducted to with the aim of determining the relationship between student self-assessment of motor skill performance and the results of the same obtained based on the application of appropriate tests for the assessment of students' motor status. The assessment of motor skills was performed through a battery of seven tests: maximum number of push-ups in 10 seconds (MSKL) – used to assess the dynamic strength of the arm and shoulder girdle, standing long jump (MSDM) – used to assess the explosive power of the lower extremities, agility with a stick (MOKP) – used to assess coordination, the maximum number of trunk lifts in 30 seconds (MPTR) – used to assess the dynamic strength of the trunk, hand tapping (MTAR) – used to assess the frequency of hand movements, forward roll - backward roll – running (MKNT) – used to assess agility, and the Cooper's 12-minute running test (MKUP) – used to assess aerobic endurance. For the self-assessment of motor skills, a constructed questionnaire with six responses was used: excellent (5), above average (4), average (3), below average (2), poor (1), and very poor (0). The obtained results showed a positive transfer of the Special Physical Education (SPE) curriculum to body coordination, agility, and the dynamic strength of the arm and shoulder girdle. Students' self-assessments of motor skills in the test for the assessment of trunk dynamic strength, dexterity and agility were excellent. The students provided poor self-assessments regarding the test for the assessment of explosive power of the lower extremities, speed, and the frequency of movement, the dynamic strength of the arm and shoulder girdle and body coordination. The students provided overestimated self-assessments in the aerobic endurance test. The obtained results indicate

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the need to enrich the teaching content of SPE, primarily in the area of motor skills aimed at the development of aerobic endurance, as well as the implementation of the self-assessment method in the same.

Keywords: motor skills, assessment, self-assessment of results.

INTRODUCTION

Special physical education, as part of the system of the teaching process of the Faculty of Security Studies, whose basis are martial arts such as judo, karate and jiu jitsu, as well as the combination of the techniques of the mentioned sports, aims to improve and maintain basic motor skills,[2] as well as the acquisition of specific techniques and motor skills, which can indirectly affect the development of basic motor skills. An appropriate teaching and training process enables general and specific motor skills to be transformed and adapted to the professional needs of security workers. The modern way of life and the challenges posed to members of the security forces require highly developed basic motor skills, specific motor skills and functional skills. We can conclude that one of the basic factors for the successful functioning of institutions and agencies and for security personnel to be successful in their work is well-developed motor skills and good performance of specific motor tasks (Milošević, 1985; Dopsaj et al., 2002; Blagojević, Dopsaj & Vučković, 2006).

In order for them to act rationally and with maximum efficiency in everyday situations, it is necessary for members of the security forces to be involved in organized or individual training activities. Also, it is necessary that persons dealing with security work develop awareness of the positive impact of physical exercise on health and improvement of general physical wellness. Numerous studies point out the importance of regular physical exercise: Stojičić (1994), Milošević (1985), Milošević et al. (1994), Božić, Milošević and Zulić (1990), Mudrić, Jovanović, Milošević and Ćirković (1994), Blagojević and et al., (1994), Blagojevića (1996), and (1997), Dopsaj, et al., (1996), Milošević, Mudrić and Amanović (2002), Dopsaj et al., (2002), Amanović, Mudrić and Jovanović (2002), Suboticko (2003), Amanović, Milošević and Mudrić (2004), and Gužvice (2005), (2006), (2007), and (2008). Also, Paspalj (2008), (2009), (2010), (2012), (2013), as well as Janković, Vučković and Blagojević (2014), reached similar research results. Studies conducted by the above-mentioned authors confirmed that well-developed motor skills are of great importance, not only in mastering the Special Physical Education program, but also in their effective practical application in a real life situation.

2 The term motor skills often refers to human abilities that participate in solving motor tasks and condition successful movement (Malacko, 1991).

Regarding basic motor skills, we mean first of all motor skills that are, more or less, genetically determined, which are manifested, to a greater or lesser extent, in the daily motor functioning of a person. Unlike basic motor skills, specific motor skills are acquired over the course life and are the result of a specific training process. According to Nićin and Lolić (2010), the following division of basic motor skills is accepted today: strength, speed, endurance, coordination, flexibility, balance and precision. It is certain that the aforementioned motor skills, that is, their subsystems, play a significant role in the performance of everyday work activities, which are full of uncertainty and require police officers to quickly solve whatever problems arise. The effectiveness of throwing techniques, kicks, avoiding the opponent's attacks, quick entrances is conditioned by the development of explosive power. Speed plays a very important role when hitting and moving in the guard, and when making blocks efficiently. Often, police officers find themselves in a situation in which they need to perform attacks or defenses for a longer period of time, and if they do not have well-developed endurance, they will certainly not be able to act appropriately and make rational decisions. Speed in all its manifestations (speed of reaction, speed of individual movement, frequency of movement) is extremely important for the effective execution of various throwing techniques, movement, levers, kicks, evasion and blocks, avoiding opponent's attacks, timely blocking, back kicks, execution of combination and technical elements (kicks, sweeps, levers, throws).

As for the self-assessment of motor skills, that is, this type of research, it is mostly related to adolescents' self-assessments, who were involved in organized forms of physical exercise. Previous studies (Eccles et al., 1993; Marsh 1993; Crocker et al., 2000; Jürimäe & Rego 2002; Raudsepp et al., 2002; Daley 2002; Planinsec et al. 2005; Bosnar and Vukmir 2008) showed a high level of correlations on the development and self-assessment of the state of motor skills, with special emphasis on endurance, strength, flexibility and physical structure. According to Lintunen (1995), self-assessment is a very important indicator that characterizes physical and psychological adaptation to the world. Research conducted by Marsh (1993), on a sample of Australian school children aged 9-15 years, in which answers to general questions about self-assessed physical abilities (fitness) were given, a significant correlation of self-assessment with numerous indicators of general physical skills (fitness) was determined, such as cardiovascular endurance, muscular strength and body composition.

In order to carry out quality research of the human motor area, it is necessary to apply tests with good metric characteristics, that is, the use of tests that are objective, reliable, valid, calibrated, sensitive and economical. Also, the condition of the motor area can be predicted using the self-assessment method. According to Sporiš et al., (2011), self-assessment contributes to the self-actualization of the individual, who thereby additionally builds awareness of his/her values, physical skills, and his/her own body. Also, a large number of authors believe that the ability to self-assess depends on the level of self-confidence and

their involvement in physical activity programs. It is evident that people who regularly do physical exercise have a higher level of self-confidence, act more rationally and make more effective decisions in specific situations.

The aim of this paper is to determine the relationship between the self-assessment of the motor skills involving students at the Faculty of Security Studies, and the results obtained based on the application of appropriate tests for the assessment of the students' motor status. This research includes tests that evaluate the explosive strength of the lower extremities (long jump), dynamic strength of the arm and shoulder girdle (maximum number of push-ups in 10 seconds), dynamic trunk strength (maximum number of trunk lifts in 30 seconds), body coordination (agility with a stick), agility (forward roll, backward roll, running), speed of movement (hand tapping), and aerobic endurance (Cooper's 12-minute running test), which are an integral part of the curriculum within the Special Physical Education course.

The obtained and objective results of the motor skills self-assessment will enable students at the Faculty of Security Studies to more realistically assess their own skills and knowledge, and more adequately apply them in real situations.

RESEARCH METHODS

Sample of respondents

The sample consisted of the respondents, that is, 43 first-year male students at the Faculty of Security Studies in Banja Luka. The average age of the students was 19 ± 0.6 years, body height 181.85 ± 6.13 cm, body weight 78 .43 ± 9.83 kg, and body fat index 23.71 ± 2.43 kg/m2. All respondents were healthy with no visible physical defects. It is necessary to emphasize that all of the respondents who participated in this research successfully passed the medical examination and psychological tests as part of admission to the Faculty of Security Studies.

Sample of variables

The assessment of motor skills among the respondents was carried out on the basis of a battery of seven tests, which are used as entrance exams, when enrolling at the Faculty of Security Studies, such as standing long jump (MSDM) – used to assess the explosive power of the lower extremities, maximum number of trunk lifts in 30 seconds (MPTR) – used to assess trunk dynamic strength, hand tapping (MTAR) – used to assess frequency of hand movement, maximum number of push-ups in 10 seconds (MSKL) – used to assess dynamic arm strength and shoulder girdle, agility with a stick (MOKP) – used to assess coordination, forward roll -backward roll - running (MKNT) – used to assess agility,

and a test to evaluate aerobic endurance – the Cooper's 12-minute running test (MKUP). All tests for the assessment of motor skills contain the necessary metric characteristics with a clearly defined protocol and application conditions.

Data-processing methods

Statistical processing and arrangement of data was performed using statistical software program SPSS Statistics 17.0 (Hair, Anderson, Tatham & Black, 1998). Comparative and descriptive statistical procedures were used for the statistical processing of the obtained data. Using the method of primary data processing, information was obtained on the distribution of variables within the examined area, where the arithmetic mean was determined as a measure of the average value of the results, and the standard deviation as a measure of the deviation from the results of the mean of the achieved results. The regularity of the data distribution was tested using the Kolmogorov-Smirnov test. The Student's t-test for dependent samples was used to test the difference in average values during the initial and final measurements. In order to obtain the best possible research results, in addition to the numerical indicators, a qualitative assessment of the results achieved during the initial and final measurements was performed. Before the final assessment of motor and functional abilities, students used a self-assessment questionnaire to anticipate their explosive power of the lower extremities, dynamic power of the arm and shoulder girdle, the dynamic power of the trunk, coordination, agility, the frequency of hand movements and aerobic endurance. The constructed self-assessment questionnaire contained six answers: excellent (5), above average (4), average (3), below average (2), poor (1) and very poor (0), whereby the students were explained only the statistical status of the numerical symbol with self-assessment of each individual manifest variable. The reliability of the self-assessment questionnaire was determined by the Cronbach's coefficient.

RESULTS AND DISCUSSION

The results of the respondents related to assessment of the status of students' motor skills in the entrance exam and the status of students' motor skills at the end of the second semester are shown in Table 1.

Table 1: Results of motor skills in the entrance exam and at the end of the second semester

Variable	Measurement results in the entrance exam				Measurement results at the end of the second semester			
	Number of respondents	Mean value of the results	Deviation from the mean	Significance of the Kolmogorov-Smirnov test	Number of respondents	Mean value of the results	Deviation from the mean	Significance of the Kolmogorov-Smirnov test
MSDM	43	228.81	22.18	0.73	43	232.48	21.97	0.68
MSKL	43	13.65	2.18	0.01	43	12.93	2.63	0.16
MPTR	43	28.88	3.38	0.46	43	29.16	5.17	0.83
MOKP	43	6.58	1.74	0.51	43	5.87	1.61	0.04
MKNT	43	6.18	0.74	0.11	43	5.99	0.53	0.85
MTAP	43	53.00	4.29	0.48	43	53.95	3.57	0.74
MKUP	43	2624.53	363.38	0.90	43	2537.67	353.16	0.91

Notes: MSDM – standing long jump, MSKL – number of push-ups in 10 seconds, MPTR – number of trunk lifts in 30 seconds, MOKP – agility with a stick, MKNT – forward roll-backward roll-running, MTAP – hand tapping, MKUP – Cooper's 12-minute running test.

The differences in the results of motor skills obtained in the entrance exam and the results the of motor skills measurement at the end of the second semester, which are listed in Table 1, according to the dependent samples t-test, an increase in the arithmetic means of the results achieved in the long jump (MSDM) may be observed between the measurements in the entrance exam (M = 228.81) and at the end of the second semester (M = 232.48). The increase in the arithmetic means between the two measurements was 3.67. The obtained results of trunk dynamic strength (MPTR) also showed an increase in the arithmetic mean between the measurement in the entrance exam (M = 28.88) and the measurement at the end of the second semester (M = 29.16), which was 0.28. An increase in the arithmetic mean is also observed in hand tapping (MTAR) between the measurement in the entrance exam (M = 53.00) and the measurement at the end of the second semester (M = 53.95). The increase in the arithmetic means between the two measurements was 0.95. The obtained results in Table 1 show that there was a decrease in the arithmetic means of the results achieved in certain motor skills tests. When performing the arm and shoulder girdle dynamic strength test (MSKL), there was a decrease in the arithmetic mean between the measurements in the entrance exam (M = 13.65) and the measurements at the end of the second semester (M = 12.93), and this difference was 0.72. A decrease in the arithmetic mean is observed in the stick agility test (MOKP) between the measurements in the entrance exam (M = 6.58) and at the end of the second semester (M = 5.87), which is 0.71. Bearing in mind the fact that, regarding this test, a lower value represents a better result, this difference can be considered as an improvement in the results measured at the end of the second semester compared to the measurement in

the entrance exam. The obtained results of the agility test (MKNT) also show a decrease in the arithmetic mean between the measurement in the entrance exam (M = 6.18) and the measurement at the end of the second semester (M = 5.87), which amounts to 0.19. Also, as with the previous test, a lower value represents a better result, and this difference can be considered as an improvement in the results measured at the end of the second semester compared to the measurement in the entrance exam. The results of the aerobic endurance test (MKUP) also show a decrease in the arithmetic mean between the measurements in the entrance exam (M = 2624.53) and at the end of the second semester (M = 2537.67). The reduction of the arithmetic mean between the two measurements was 86.86.

Numerical data on the scores achieved on the motor skills test as a part of the entrance exam and at the end of the second semester are shown in Table 2.

Table 2: Scores for the results of motor skills measurement in the entrance exam and motor skills measurement at the end of the second semester

Variables	Scores for the results of measurements in the entrance exam							Scores for the results of measurement at the end of the second semester						
Scores	0	1	2	3	4	5	AS	0	1	2	3	4	5	AS
MSDM	16	5	4	9	3	6	**1.90**	11	10	4	6	6	6	**2.03**
MSKL	1	0	2	5	16	19	**4.13**	1	1	5	8	14	14	**3.74**
MPTR	0	2	4	10	15	12	**3.72**	1	2	5	10	9	16	**3.67**
MOKP	6	3	7	14	8	5	**2.69**	4	0	5	9	18	7	**3.34**
MKNT	2	0	3	22	13	3	**3.23**	0	0	9	18	11	5	**3.27**
MTAP	0	1	4	13	15	10	**3.67**	0	0	4	12	17	10	**3.76**
MKUP	19	7	7	4	3	3	**1.39**	24	10	4	1	2	2	**0.90**

Notes: MSDM – standing long jump, MSKL – number of push-ups in 10 seconds, MPTR – number of trunk lifts in 30 seconds, MOKP – agility with a stick, MKNT – forward roll-backward roll-running, MTAP – hand tapping, MKUP – Cooper's 12-minute running test, AS – average score.

Table 2 shows that, when performing the standing long jump test (MSDM), 16 respondents when measuring their motor skills in the entrance exam and 11 respondents when measuring their motor skills at the end of the second semester received 0 points, while six respondents when measuring motor skills in the entrance exam and six respondents at the end of the second semester were awarded 5 points. The mean of scores, when measuring motor skills in the entrance exam is **1.90**, and **2.03** when measuring motor skills at the end of the second semester.

In the test for assessing the dynamic strength of the arms and frame girdle, that is, the number of push-ups in 10 seconds (MSKL), one respondent, when measuring motor skills in the entrance exam, and one respondent, when measuring motor skills at the end of the second semester were awarded 0 points, while 19 respondents, when measuring motor skills in the entrance exam and 14 respondents, when measuring motor skills at the end of the second semester,

were awarded 5 points. The mean value of the scores, when measuring motor skills in the entrance exam is **4.13** and **3.74** when measuring motor skills at the end of the second semester.

When performing the test for the assessment of dynamic strength of the trunk – trunk lifts in 30 seconds (MPTR), one respondent was awarded 0 points when measuring motor skills at the end of the second semester, while 12 respondents were awarded 0 points when measuring motor skills in the entrance exam, while 16 respondents, when measuring motor skills at the end of the second semester, were awarded 5 points. The average value of scores regarding the measurement of motor skills in the entrance exam is **3.72**, and the measurement of motor skills at the end of the second semester is **3.67**.

In the test for the assessment of body coordination – agility with a stick (MOKP), 6 respondents, when measuring motor skills in the entrance exam, and 4 respondents, when measuring motor skills at the end of the second semester, were awarded 0 points, while 5 respondents, when measuring motor skills in the entrance exam and 7 respondents, when measuring motor skills at the end of the second semester were awarded 5 points. The mean value of the scores when measuring motor skills in the entrance exam is **2.69**, and **3.34** when measuring motor skills at the end of the second semester.

In the test for the assessment of agility and forward roll – backward roll - running (MKNT), 2 respondents were awarded 0 points when measuring motor skills in the entrance exam, while 3 respondents, when measuring motor skills in the entrance exam, and 5 respondents, when measuring motor skills at the end of the second semester, were awarded 5 points. The average value of scores when measuring motor skills in the entrance exam is **3.23** and **3.27** at the end of the second semester.

For the assessment of the speed of movement frequency – hand tapping (MTAR), none of the respondents, when measuring motor skills in the entrance exam and at the end of the second semester were awarded 0 points, while 10 respondents, when measuring motor skills in the entrance exam, and 10 respondents, when measuring motor skills at the end of the second semester, were awarded 5 points. The mean value of the scores when measuring motor skills in the entrance exam is **3.67**, and **3.76** when measuring motor skills at the end of the second semester.

The obtained result is expected in view of previous research results obtained by authors who dealt with similar issues. Positive transformations of the teaching process of the Special Physical Education course are especially visible in the respondents who achieved poor scores when measuring motor skills in the entrance exam, and they made more progress than the respondents who also achieved results in the measurement of motor skills in the entrance exam. Precisely because of this, the authors believe that the respondents who performed poorly in the entrance exam during the motor skills test statistically contributed the most to the differences between the same measurements in the entrance exam and at the end of the second semester.

Lower results on the measurement of motor skills at the end of the second semester, in relation to the same results in the entrance exam, were shown by the respondents in the test for the assessment of aerobic endurance – Cooper's 12-minute running test (MKUP). The mean of the scores when measuring motor skills in the entrance exam is **1.39**, and **0.90** when measuring motor skills at the end of the second semester. A large number of respondents performed poorly in this test. When measuring aerobic endurance in the entrance exam, 19 respondents were awarded 0 points and even 24 respondents at the end of the second semester. Considering the small number of lessons, which were not aimed at the development of this motor skill, and due to the teaching process dominated by the adoption of new motor programs, the obtained results are not surprising.

Analysis of the results obtained through the implementation of the Special Physical Education program, that is, the mean value of the final measurement of all variables, indicates that the mean value of the achieved results has increased compared to the initial measurement of the motor skills of trunk dynamic strength, coordination, agility and the frequency of hand movements. Decreases in the average score of the achieved results compared to the initial measurement may be observed in the explosive strength of the lower extremities, dynamic strength of the arm and shoulder girdle, and aerobic endurance.

The Student's t-test results for paired samples for the observed variables of motor skills after the measurement in the entrance exam and the measurement at the end of the second semester are shown in Table 3.

Table 3: Differences in the results when measuring motor skills in the entrance exam and at the end of the second semester

Motor skills variables		Paired score differences					t test	Number of degrees of freedom	Significance (two-way)
		The mean of scores	Deviation from the mean	Standard error mean	95% confidence interval				
					Lower limit	Upper limit			
Pair 1	MSDM1 MSDM2	-3.67	14.74	2.24	-8.2130	.8649	-1.63	42	0.11
Pair 2	MSKL1 MSKL2	0.72	1.36	0.20	0.29	1.142	3.45	42	0.00
Pair 3	MPTR1 MPTR2	-0.27	4.42	0.67	-1.64	1.082	-0.41	42	0.68
Pair 4	MOKP1 MOKP2	0.71	1.37	0.21	0.28	1.136	3.38	42	0.00
Pair 5	MKNT1 MKNT2	0.19	0.53	0.08	0.02	.3586	2.35	42	0.02
Pair 6	MTAP1 MTAP2	-0.95	4.05	0.61	-2.20	.2938	-1.54	42	0.13
Pair 7	MKUP1 MKUP2	86.86	166.61	25.40	35.58	138.13	3.41	42	0.00

The results obtained when measuring the explosive strength of the lower extremities (MSDM) at the end of the second semester, regardless of the increase in the arithmetic mean, did not show statistical significance in relation to the initial measurement. The results obtained when measuring the dynamic strength of the arm and shoulder girdle (MSKL) at the end of the second semester showed significant deviations in relation to the measurement in the entrance exam, and they are statistically significant (**p=0.00**). Regardless of the increase in the arithmetic mean of the measurement of dynamic trunk strength (MPTR) at the end of the second semester compared to the measurement in the entrance exam, it is not statistically significant. The results of the measurement of coordination of the body (MOKP) at the end of the second semester showed a statistically significant difference in results (**p=0.00**) compared to the measurement in the entrance exam. Also, statistically significant increases in results (**p=0.02**) when measured at the end of the second semester are also visible in the dexterity and agility tests (MKNT) and the aerobic endurance test (MKUP) (**p=0.00**). The results obtained when measuring the hand movement frequency (MTAP) at the end of the second semester, regardless of the increase in the arithmetic mean, in relation to the measurement in the entrance exam, are not statistically significant.

Table 4 shows the differences in the motor skill scores obtained in the entrance exam and at the end of the second semester.

Table 4: Differences in the motor skill scores obtained in the entrance exam and at the end of the second semester

Motor skills variables		The mean score	Number of respondents	Deviation from the mean	Standard error of the mean
Pair 1	MSDM1	1.90	43	1.84	0.28
	MSDM2	2.09	43	1.81	0.27
Pair 2	MSKL1	4.13	43	1.05	0.16
	MSKL2	3.74	43	1.23	0.18
Pair 3	MPTR1	3.72	43	1.11	0.17
	MPTR2	3.67	43	1.34	0.20
Pair 4	MOKP1	2.69	43	1.52	0.23
	MOKP2	3.34	43	1.39	0.21
Pair 5	MKNT1	3.23	43	1.01	0.15
	MKNT2	3.27	43	0.93	0.14
Pair 6	MTAP1	3.67	43	1.01	0.15
	MTAP2	3.76	43	0.92	0.14
Pair 7	MKUP1	1.39	43	1.6	0.24
	MKUP2	0.90	43	1.39	0.21

Based on the results obtained in motor skill tests (Table 4), that is, measurements in the entrance exam and at the end of the second semester, it is evident that there was an increase in the arithmetic mean in the tests for the

assessment of explosive strength (1.90 - **2.09**), body coordination (2.69 - **3.34**), dexterity and agility (3.23 – **3.27**) and the test for the assessment of frequency of hand movements (3.67 – **3.76**). A decrease in the arithmetic mean of the score is visible in the scores for the repetitive arm and shoulder girdle strength tests (4.13 - **3.74**), trunk dynamic strength (3.72 - **3.67**) and the aerobic endurance test (1.39 - **0.90**).

The results of the motor skills scores achieved in the entrance exam and at the end of the second semester are shown in table 5, using the Student's t-test.

Table 5: Student's t-test – the results of motor skill scores obtained in the entrance exam and at the end of the second semester

Motor skills variables		Paired score differences					t test	Number of degrees of freedom	Significance (two-way)
		The mean of the score	Deviation from the mean	Standard error of the mean	95% confidence interval				
					Lower limit	Upper limit			
Pair 1	MSDM1 MSDM2	-0.18	1.15	0.17	-0.54	0.17	-1.05	42	0.29
Pair 2	MSKL1 MSKL2	0.39	0.65	0.10	0.19	0.59	3.93	42	0.00
Pair 3	MPTR1 MPTR2	0.04	1.23	0.18	-.33	0.42	0.24	42	0.80
Pair 4	MOKP1 MOKP2	-0.65	1.13	0.17	-0.99	-0.30	-3.77	42	0.00
Pair 5	MKNT1 MKNT2	-0.04	0.98	0.14	-0.33	0.23	-0.33	42	0.74
Pair 6	MTAP1 MTAP2	-0.09	1.08	0.16	-0.42	0.24	-0.56	42	0.57
Pair 7	MKUP1 MKUP2	0.48	166.61	0.15	0.18	0.79	3.25	42	0.00

Regardless of the progress, that is, the increase in the arithmetic mean of the scores for the explosive strength test (MSDM) at the end of the second semester compared to the measurement in the entrance exam (-0.18), it is still not statistically significant. In contrast to the test of explosive strength, when measured at the end of the second semester, the increase in the arithmetic mean score (-0.65) in the body coordination test (MOKP) is statistically significant (p=0.00). Also, when taking measurement at the end of the second semester, there were visible increases in the scores regarding the arithmetic means of the dexterity and agility test (MKNT) (-0.04) and the speed of movement frequency test (MPTR) (-0.09), but these increases are not statistically significant. A statistically significant decrease in the arithmetic average score can be observed in the tests for the assessment of the dynamic strength of the arm and shoulder girdle (MSKL) (p=0.00), and aerobic endurance (MKUP) (p=0.00). In the trunk dynamic strength test (MPTR), there is also a decrease in the arithmetic mean score (p=0.04), but it is not statistically significant.

Table 6 shows scores for the self-assessment of motor skills test results and the results of the assessment of motor skills among the students at the end of the second semester.

Table 6: Grades for self-assessment of motor skills results and motor skills measurement results at the end of the second semester

Variables	Scores for the self-assessment of motor skills							Scores for the measurement results at the end of the second semester						
Score	0	1	2	3	4	5	AS	0	1	2	3	4	5	AS
MSDM	4	12	5	9	7	6	**2.48**	11	10	4	6	6	6	**2.03**
MSKL	0	0	2	8	14	19	**4.16**	1	1	5	8	14	14	**3.74**
MPTR	0	1	4	10	11	17	**3.90**	1	2	5	10	9	16	**3.67**
MOKP	2	4	9	15	7	6	**2.90**	4	0	5	9	18	7	**3.34**
MKNT	0	2	5	14	12	10	**3.53**	0	0	9	18	11	5	**3.27**
MTAR	0	0	1	10	17	15	**4.06**	0	0	4	12	17	10	**3.76**
MKUP	10	13	7	7	4	2	**1.72**	24	10	4	1	2	2	**0.90**

Notes: MSDM – standing long jump, MSKL – number of push-ups in 10 seconds, MPTR – number of trunk lifts in 30 seconds, MOKP – agility with a stick, MKNT – forward roll-backward roll-running, MTAP – hand tapping, MKUP – Cooper's 12-minute running test, AS – average score.

Based on the results, it is evident that in the first variable used to assess standing long jump (MSDM), the respondents' assessments when self-assessing motor skills in relation to the results achieved in the motor skills test at the end of the second semester, were beter than the achieved results. Thus, only 4 respondents chose a result worth 0 points and 12 respondents chose a result worth 1 point, while in the motor skills test at the end of the second semester, 11 respondents were awarded 0 points and 10 respondents were awarded 1 point, which represents a worse result compared to the self-assessment of motor skills based on one's own perception. The mean of self-assessment score is **2.48**, and **2.03** when measuring motor skills at the end of the second semester.

In the test for assessing the dynamic strength of the arm and shoulder girdle – the number of push-ups in 10 seconds (MSKL), none of student chose a result which awards 0 points or 1 point, while in the motor skills test at the end of the second semester 1 respondent was awarded 0 points and 1 respondent received 1 point. Also, in the self-assessment, 19 respondents chose the result awarded 5 points, while in the measurement of motor skills at the end of the second semester, 14 respondents were awarded 5 points, which represents a worse result compared to the self-assessment of motor skills, based on their

own opinion. The mean of self-assessment score is **4.16**, and **3.74** when measuring motor skills at the end of the second semester.

During the assessment of the dynamic strength of the trunk, that is, the number of trunk lifts in 30 seconds (MPTR), when performing self-assessment, no student chose the result, which is awarded 0 points, while 1 respondent chose a result which awards 1 point. In the motor skills test at the end of the second semester, 1 respondent was awarded 0 points and 2 respondents 1 point. Further, 11 respondents chose a result which awards 4 points and 17 respondents chose a result which awards 5 points, while at the end of the second semester, when measuring motor skills, 9 respondents were awarded 4 points and 16 respondents 5 points, which represents a worse result compared to the self-assessment of motor skills based on one's own perception. The mean value of the self-assessment score is **3.90**, and **3.67** when measuring motor skills at the end of the second semester.

In terms of the variable for agility with a stick (MOKP), the respondents' self-assessment of their motor skills results was poor compared to the results achieved in the motor skills test at the end of the second semester. Thus, 2 respondents chose a result which awards 0 points, while 4 respondents chose a result which awards 1 point, while in the motor skills test at the end of the second semester, 4 respondents were awarded 0 points while none of the respondents were awarded 1 point. Also, in the self-assessment, 7 respondents chose a result which awards 4 points and 6 respondents chose a result which awards 5 points, while in the motor skills test at the end of the second semester, 18 respondents scored a result awarded 4 points and 7 respondents achieved a result which awards 5 points. The mean value of the self-assessment score was **2.90**, and **3.34** when measuring motor skills at the end of the second semester.

Regarding the test for the assessment of dexterity and agility – forward roll – backward roll - running (MKNT), the respondents showed better results in the self-assessment of their motor skills scores compared to the scores obtained in the motor skills test at the end of the second semester. Thus, 12 respondents achieved a result which awards 4 points and 10 respondents achieved a result which awards 5 points, while in the motor skills test at the end of the second semester, 11 respondents achieved a result which awards 4 points, while 5 of them achieved a result which awards 5 points. The mean value of the self-assessment score was **3.53**, and **3.27** when measuring motor skills at the end of the second semester.

In the case of the hand tapping variable (MTAR), the respondents also achieved better results in the self-assessment of their motor skills results compared to the scores achieved in the motor skills test at the end of the second semester. Thus, 17 respondents achieved a result which awards 4 points and 15 respondents achieved a result awarding 5 points, while in the motor skills test at the end of the second semester, 17 respondents achieved a result which awards 4 points, while 10 of them achieved a result which awards 5 points. The mean

value of the self-assessment score was **4.06**, and **3.76** when measuring motor skills at the end of the second semester.

Regarding the variable for aerobic endurance – Cooper's 12-minute running test (MKUP), the respondents also showed better results in the self-assessment of their motor skills results compared to the scores obtained in the motor skills test at the end of the second semester. Thus, 10 respondents chose a result which awards 0 points and 13 respondents chose a result which awards 1 point, while in the motor skills test at the end of the second semester, 24 respondents achieved a result which awards 0 points and 10 respondents achieved a result which awards 1 point. The mean value of the self-assessment score was **1.72**, and **0.90** when measuring motor skills at the end of the second semester. A large number of respondents who achieved a poor result in this test were recorded, which leads to the conclusion that they did not work on maintaining aerobic endurance from the moment they enrolled in school, but that they had worked on developing it before enrolling in the Faculty of Security Studies.

The comparison of the mean values in the self-assessment of motor skills results and the achieved results in the motor skills test at the end of the second semester is shown in Table 7.

Table 7: Comparison of the mean values in motor skills self-assessments and the results achieved in the motor skills test at the end of the second semester

		Mean	Number of respondents	Deviation from the mean	Standard error of the mean
Pair 1	MSDM test score	2.03	43	1.81	0.27
	Self-assessment of MSDM	2.48	43	1.60	0.24
Pair 2	MCKЛ test score	3.74	43	1.23	0.18
	Self-assessment of MSKL	4.16	43	0.89	0.13
Pair 3	MPTR test score	3.67	43	1.34	0.20
	Self-assessment of MPTR	3.90	43	1.10	0.16
Pair 4	MOKP test score	3.34	43	1.39	0.21
	Self-assessment MOKP	2.90	43	1.32	0.20
Pair 5	MKNT test score	3.27	43	0.93	0.14
	Self-assessment of MKNT	3.53	43	1.12	0.17
Pair 6	MTAP test score	3.76	43	0.92	0.14
	Self-assessment of MTAP	4.06	43	0.82	0.12
Pair 7	MKUP test score	0.90	43	1.39	0.21
	Self-assessment of MKUP	1.72	43	1.46	0.22

The analysis of the results in Table 7 demonstrates that students self-assessed their results quite well in the trunk dynamic strength test (3.67 - **3.90**) dexterity and agility test (3.27 - **3.53**), in which their actual grade deviates the least from the self-assessed one. The students' self-assessment of the speed of movement frequency test results (3.76 - **4.06**) was good. Their self-assessment of the explosive strength of the lower extremities test results (2.03 - **2.48**) and

the dynamic strength of the arms and shoulder girdle test results (3.74 - **4.16**) was quite poor. In the coordination test, the students' self-assigned a poorer test result compared to the one achieved (3.34 - **2.90**). The students achieved the poorest average result in the aerobic endurance test (0.90), and they self-assessed the same skill by 0.82 more than the result achieved (1.72).

The results of the Student's t-test for the self-assessment of motor skills results and the the motor skills test results at the end of the second semester are shown in Table 8.

Table 8: Student's t-test, results of the self-assessment of motor skills test result and the result achieved in the motor skills test at the end of the second semester

		Paired result differences					t test	Number of degrees of freedom	Significance (two-way)
		Mean	Deviation from the mean	Standard error of the mean	95% confidence interval				
					Lower limit	Lower limit			
Pair 1	MSDM score Self-assessment of MSDM	-0.39	1.17	0.17	-0.75	-0.03	-2.20	42	0.03
Pair 2	MSKL score Self-assessment of MSKL	-0.41	1.05	0.16	-0.74	-0.09	-2.61	42	0.01
Pair 3	MPTR score Self-assessment of MPTR	-0.23	1.30	0.19	-0.63	0.16	-1.16	42	0.25
Pair 4	MOKP score Self-assessment of MOKP	0.44	1.07	0.16	0.11	0.77	2.69	42	0.01
Pair 5	MKNT score Self-assessment of MKNT	-0.25	0.90	.1375	-0.53	0.02	-1.85	42	0.07
Pair 6	MTAP score Self-assessment of MTAP	-0.30	0.88	.1353	-.5754	-0.02	-2.23	42	0.03
Pair 7	MKUP score Self-assessment of MKUP	-0.81	0.87	.1341	-1.084	-0.54	-6.06	42	0.00

Further analysis, and the obtained research results in Table 8, clearly show that the students' self-assessed their motor skills in the aerobic endurance tests as very poor – Cooper's 12-minute running test (**p=0.00**), body coordination – agility with a stick (**p=0.01**), the dynamic strength of arm and shoulder girdle – maximum number of push-ups in 10 seconds (**p=0.01**), speed of movement frequency – hand tapping (**p=0.03**), and the explosive strength of lower extremities – standing long jump (**p=0.03**), and as excellent in the tests of dynamic

trunk strength – trunk lifts in 30 seconds, that is, body dexterity and agility – forward roll - backward roll - running.

DISCUSSION

The results of the motor skills tests, that is, the difference between the initial and final measurements indicate that certain motor skills in the students at the Faculty of Security Studies remained at the same level, while some made significant progress. Although there was an increase in the arithmetic means between the initial and final measurements, in the tests for the assessment of explosive power of the lower extremities and the frequency of hand movements, they were not statistically significant, that is, there was no statistically significant increase in the value of these motor skills. The results of the mentioned tests should not be worrisome, considering that the measurement of the mentioned motor skills was made during the entrance exam, in the period when students were better physically prepared. Also, it is necessary to emphasize that speed and explosive power are genetically determined and there is very little possibility of influencing them through physical training. According to Nićin and Lolić (2010), speed is 95% genetically conditioned and explosive power 70%. The mentioned motor skills are in direct correlation. There was an increase in the values, which are statistically significant, in the tests for the assessment of dynamic arm and shoulder girdle strength, body coordination, dexterity and agility. A statistically significant decrease in values compared to the initial measurement is visible in the aerobic endurance test. It is evident that the program aimed at the development of aerobic endurance alone is insufficient to improve this motor skill, and requires students to self-actualize and additional individual work in order to improve this motor skill. Additionally, the development of this and other relevant skills provided by the curriculum is possible with increased intensity and a large number of repetitions of specific motor programs in SPE classes, which requires their complete adoption, that is, their automation. Certain changes in the teaching content of SPE, that is, individualization of teaching, would contribute to more effective application of specific motor programs characteristic of security professionals. Improving aerobic endurance will indirectly lead to the improvement of other motor skills. The obtained results of the motor skills tests were also confirmed by the final grades on motor skills tests.

The students provide excellent self-assessments regarding motor skills test results and the results achieved in the tests for the assessment of trunk dynamic strength and dexterity and agility tests. Good results of the assessment of the dynamic strength of the trunk correlate with the modern trends of aesthetic criteria on appearance. Taveras et al., (2004), indicate that adolescents want to look like celebrities and therefore exercise more frequently. The students self-assessed the results in the test of speed, frequency of movement and explo-

sive power of the lower extremities slightly worse. Regarding the self-assessment of the dynamic arm and shoulder girdle strength test results, the students underestimated the result achieved. According to Sollerhead et al., (2008), continuous physical activity, as an everyday occurrence, is perceived by boys as pleasurable and an integral part of growing up, which can be one of the reasons for overestimating one's own abilities. The students underestimated self-assessment of the result achieved in the body coordination test. It is evident that the students did not have, or a small number of them had, contact with martial arts (judo, jiu jitsu and karate) which, in their introductory preparatory part, pay great attention to the improvement of coordination and flexibility of the whole body, and therefore their self-assessment is underestimated. The students particularly overestimated self-assessment of their results in the aerobic endurance test. The obtained results of the overestimated self-assessment of the motor skills test results are also in line with the findings from studies by Fox and Corbin (1989) and Sonstroem et al., (1992) that boys are more self-confident, more confident and less self-critical compared to girls during the assessment of their skills. Eccles et al., (1993) reported the same results and concluded that boys, compared to girls, assess their skills with more self-confidence.

CONCLUSION

The results of this research emphasize the importance of the application and implementation of the Special Physical Education program in the education of persons in the field of security. It is evident from the results that the content of the Special Physical Education program should be upgraded and directed towards the improvement of specific motor skills and functional abilities of students, which will enable more efficient work in the field. In addition to modern measuring instruments and objective tests, in the field of human motor skills, the authors also propose the implementation and application of the self-assessment method in the field of Special Physical Education. In addition to the above, the authors believe that through the interpretation of actual results, that is, the assessment of motor skills, and self-assessment results, students can be shown the importance of regular physical exercise, and gain a realistic picture of the physical and health status of a person working in the field of security. In most tests, students' self-assessment of motor status was overestimated, which ultimately can produce self-confidence that is not accompanied by adequate motor status, and as such can lead to unwanted consequences when performing professional duties and obligations. It follows from the above that every police officer should develop an awareness of improving his health and motor skills through self-actualization and individual work in the field physical exercise.

REFERENCES

Amanović, Đ., Mudrić, R., & Jovanović, S. (2002). Razvoj različitih vidova sile pod uticajem programa Specijalnog fizičkog obrazovanja kod studenata Više škole unutrašnjih poslova. *Zbornik radova nastavnika VŠUP*, *6*, 53-70.

Amanović, Đ., Milošević, M., & Mudrić, R. (2004). *Metode i sredstva za procjenu, praćenje i razvoj mišićne sile u Specijalnom fizičkom obrazovanju.* Beograd: Inpress.

Bosnar, K., & Vukmir, V. (2008). Self reported and measured height and weight in high school students. *5th International Scientific Conference on Kinesiology,* 679-982.

Blagojević, M., Ćirković, Z., Milošević, M., Stojičić, R., Jovanović, S., Arlov, D., & Dopsaj, M. (1994). Uticaj nekih adaptacionih karakteristika pripravnika milicionara na efekte učenja motoričkih algoritama i programa u Specijalnom fizičkom obrazovanju. *Zbornik radova prvog savjetovanja iz Specijalnog fizičkog obrazovanja Policijske akademije u Beogradu,* 49-56.

Blagojević, M. (1996). Uticaj morfoloških i motoričkih karakteristika policajaca na efikasnost učenja džudo tehnika. Beograd: Policijska akademija u Beogradu.

Blagojević, M. (1997). *Uticaj određenih motoričkih tretmana Specijalnog fizičkog obrazovanja na promjenu morfoloških i motoričkih karakteristika studenata Policijske akademije.* Doktorska disertacija. Univerzitet u Beogradu: Fakultet fizičke kulture.

Blagojević, M., Dopsaj, M., & Vučković, G. (2006). *Specijalno fizičko obrazovanje 1 za studente Policijske akademije.* Beograd: Inpress.

Božić, S., Milošević, M., & Zulić, M. (1990). Uticaj nekih antropoloških karakteristika radnika na strukturiranje motoričkih algoritama u Specijalnom fizičkom obrazovanju. *13. maj, 2,* 128-135.

Gužvica, M. (2005). Povezanost nekih koordinacionih sposobnosti sa nivoom usvojenosti tehnika iz programa specijalnog fizičkog obrazovanja. *Bezbjednost, policija, građani, 2,* 353-361.

Gužvica, M. (2006). *Valorizacija novog modela situaciono-motoričke obuke studenata Visoke škole unutrašnjih poslova.* Doktorska disertacija. Univerzitet u Beogradu: Fakultet sporta i fizičkog vaspitanja.

Gužvica, M. (2007). Predikcija uticaja latentnih motoričkih sposobnosti i morfoloških karakteristika na uspješnost izvođenja tehnika iz programa specijalnog fizičkog obrazovanja. *Bezbjednost, policija, građani, 1,* 879-890.

Gužvica, M. (2008). Latente motoričke strukture značajne za izvođenje udaraca čelom pesnice *Bezbjednost, policija, građani, 1,* 21-30.

Daley, A. J. (2002). Extra-Curricular Physical Activities and Physical SelfPerceptions in British 14-15-Year-Old Male and Female Adolescents, *European Physical Education Review, 1*(8), 37-49.

Dopsaj, M., Milošević, M., Arlov, D., Blagojević, M., & Stefanović, Đ. (1996). The structure of changes in mehanic contractile characteristic of leg extensor muscles caused by combined strenght training during one-year motor learning program

in Special physical education. *Proceeding of International Congress on Sport Psychology,* 313-318.

Dopsaj, M., Milošević, M., Blagojević, M., & Mudrić, R. (2002). A new approach to discriminating athletes according to their specific fitness status when considering isometric force characteristics. *3rd International conference on strength training,* 77-78.

Dopsaj, M., Milošević, M., Blagojević, M., & Vučković, G. (2002). Evaluacija valjanosti testova za procenu kontraktilnog potencijala mišića ruku kod policajaca. *Bezbednost, 44*(3), 434-444.

Eccles, J., Wigfield, A., Rena, A. D., & Blumenfeld, P. (1993). Age and Gender Differences in Children's Self - and Task Perceptions during Elementary School. *Society for Research in Child Development, 3*(64), 830-847.

Jürimäe,T., & Rego,V. (2002). Relationships between physical activity self - perceived and actual indicators of fitness in adolescents. *Kinesiology, 34*(2), 163-168.

Janković, R., Vučković, G., & Blagojević, M. (2014). Utvrđivanje normativa za procenu specifične spretnosti policajaca za studente Kriminalističko-policijske akademije. *Bezbednost, 56*(2), 65-76.

Lintunen, T. (1995). Self-perceptions, fitness, and exercise in early adolescence: A four-year follow-up study. *Studies in Sport, Physical Education and Health, 41*, 87-87.

Malacko, J. (1991). *Osnove sportskog treninga. Kibernetički pristup. Treće prošireno izdanje.* Novi Sad: FTN, Štamparija za grafičku delatnost.

Marsh, H. W. (1993). Physical fitness self-concept: Relations of physical fitness to field and technical indicators in boys and girls aged 9-15. *Journal of Sport and Exercise Psychology, 15,* 184-206.

Milošević, M. (1985). *Određivanje strukture motoričkih svojstava milicionara.* Beograd: Visoka škola unutrašnjih poslova u Beogradu.

Milošević, M., Jovanović, S., Stojičić, R., Arlov, D., Blagojević, M., & Dopsaj, M. (1994). Model edukacije u specijalnom fizičkom obrazovanju. *Zbornik radova prvog savjetovanja iz Specijalnog fizičkog obrazovanja Policijske akademije u Beogradu*, 9-22.

Milošević, M., Mudrić, R., & Amanović, Đ. (2003): Metode i sredstva za razvoj mišićne sile u sportu. *Zbornik radova sa 3. naučno-stručnog simpozijuma. Nauka i karate sport,* 83-88.

Mudrić, R., Jovanović, S., Milošević, M. & Ćirković, Z. (1994). Predlog baterije testova za procenu složenih struktura karate tehnika u fazi usmerene obuke u SFO-u. *Zbornik radova prvog savjetovanja iz Specijalnog fizičkog obrazovanja Policijske akademije u Beogradu,* 124-133.

Nićin, Đ. & Lolić, V. (2010). *Antropomotorika teorija i metodika.* Banja luka: Panevropski Univerzitet Apeiron.

Planinsec, J., & Fosnaric, S. (2005). Relationship of perceived physical self-concept and physical activity level and sex among young children*. Perceptual and motor skills, 100*(2), 349-53.

Paspalj, D. (2008). *Uticaj bazičnih motoričkih sposobnosti na efikasnost izvođenja tehnika bacanja iz programa Specijalnog fizičkog obrazovanja.* Magistarski rad. Univerzitet u Banjoj Luci: Fakultet fizičkog vaspitanja i sporta.

Paspalj, D. (2009). Latentne motoričke strukture značajne za izvođenje tehnike čišćenja nastupajuće noge iz programa Specijalnog fizičkog obrazovanja. *Bezbjednost, policija, građani, 1,* 173-186.

Paspalj, D. (2010). Efekti različitih kontinuiteta nastave na nivo usvojenosti tehnika padova, čišćenja i bacanja iz programa specijalnog fizičkog obrazovanja. *Bezbjednost, policija, građani, 3-4,* 513-522.

Paspalj, D. (2012). Razlike u nekim motoričkim sposobnostima studenata Visoke škole unutrašnjih poslova s obzirom na efikasnost izvođenja odbrane od napada štapom odozgo. *Bezbjednost, policija, građani, 3–4,* 467-478.

Paspalj, D. (2013). Polni dimorfizam antropološkog profila studenata Visoke škole unutrašnjih poslova u funkciji rješavanja problemskih situacija iz Specijalnog fizičkog obrazovanja. *Bezbjednost, policija, građani, 3–4,* 167-180.

Pravilnik o upisu studenata na Fakultet bezbjednosnih nauka broj:27/3.183/2/20 od 24. 2. 2020. godine, Fakultet bezbjednosnih nauka Univerziteta u Banjoj Luci.

Raudesepp, L., & Liblik, R. (2002). Relationship of perceived and actual motor competence in children. *Perceptual and motor skills, 94*, 1059-70.

Sonstroem, R. J., Speliotis, E. D., & Fava, J. L. (1992). Perceived physical competence in adults: An examination of the Physical Self-Perception Profile. *Journal of Sport and Exercise Psychology,* 207-221.

Sollerhed, A. C., Apitzch, E., Rastam, L., & Ejlertsson, G. (2008). Factors associated with young children's self-perceived physical competence and self – reported physical activity. *Health Education Research, 1*(23), 125-136.

Sporiš, G., Šiljeg, K., Mrgan, J., & Kević, G. (2011). Self evaluation of motor and functional abilities among pupils. *Croatian Journal of Education, 13*(2), 66-81.

Stojčić, R. (1994). *Određivanje motoričke efikasnosti pripadnika specijalnih jedinica. Magistarski rad.* Univerzitet u Beogradu: Fakultet fizičke kulture.

Subotički, S. (2003). *Povezanost morfoloških i motoričkih karakteristika studenata VŠUP sa efikasnošću realizacije tehnika karatea iz programa Specijalnog fizičkog obrazovanja.* Magistarski rad. Univerzitet u Novom Sadu: Fakultet fizičke kulture.

Taveras, M. E., Rifas - Shiman, L. S., Field, E. A., Frazier, A. L., Colditz, A. G., & Gillman, W. M. (2004). *The influence of wanting to look like media figures on adolescent physical activity. Journal of Adolescent Health, 35*(1), 41-50.

Hair, J., Anderson, R., Tatham, R., & Black, W. (1998). *Multivariate data analysis (5th ed)*. New Jersey, USA: Prentice-Hall. Inc.

Fox, K. R., & Corbin, C.B. (1989). The physical self-perception profile: Development and preliminary validation. *Journal of Sport & Exercise Psychology, 2*, 408-430.

Crocker, P. R., Eklund, R.C., & Kowalski K.C. (2000). Children's physical activity and physical self-perceptions. *Journal of Sports Sciences, 18*, 383-94.

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THE SPECIFICITIES AND CHARACTERISTICS OF THE OFFENCE OF ENDANGERING ROAD TRAFFIC SAFTY AND POLICE ACTION REGARDING THIS OFFENSE

Review Article

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Abstract: In modern society, traffic represents one of the basic human needs. Traffic is a daily human activity, which is reflected in the change in the position of people, things or messages. The goal of the state is to establish a favorable state of security, and therefore traffic safety, in other words, to establish traffic with as few negative effects as possible. On the other hand, to regulate and improve road traffic safety, road traffic laws have been enacted. Traffic laws regulate the basis of development and participation in road traffic, including road traffic offenses as basic forms of traffic unsafety. Violations of traffic regulations result in certain consequences and even have an impact on the life, health and physical integrity of road traffic participants or the occurrence of material and non-material damage. Therefore, in order to increase the level of road traffic safety, the modern legal system envisages protection of road traffic in misdemeanor and criminal laws. This paper addresses the criminal law protection of road traffic through the prescription of the offense of endangering road traffic safety, the specificities and characteristics of the same offense in relation to other offenses and police practice in cases involving this criminal offense.

Keywords: offense, road traffic, police, traffic safety, endangerment.

INTRODUCTION

Since the first human settlements, the traffic activity has become special for man. Traffic activity was created as a human need and is closely related to the development of society as a whole. In theory, there are various definitions regarding traffic itself and traffic activity. Here it is necessary to point out that traffic and traffic activity are not the same. Traffic is an organized movement

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of traffic units on traffic roads. (Lipovac, 2008:15). This way of defining traffic includes all the elements, namely traffic units that make up means of transport, then the traffic road is the surface on which traffic takes place, that is, specially built areas intended for traffic, and the organization, that is, regulation of traffic through legal regulations. In addition to all the advantages of the very existence of traffic and traffic activity, there are also certain negative effects. In theory, a special scientific discipline called traffic safety has been developed, which aims to study and find the best mechanisms for safe traffic with as few negative effects as possible. Traffic safety can be viewed as a social phenomenon that can be managed in order to achieve certain goals. The basic forms of unsafe traffic are traffic offenses. Traffic offenses can be viewed as offenses against public traffic committed by road users, which can lead to traffic accidents as the largest socially harmful phenomenon in terms of traffic safety.

The safety of citizens is one of the basic goals and tasks of every state, which is one of the conditions for the stability of a society. With the development of society came the establishment of various and numerous mechanisms used to protect the most important values in all forms of life. One such mechanism is the protection provided by criminal legislation. Established criminal legislation in a society has the task of protecting the most significant forms of social goods and certain values in a society. Such protection is achieved by criminalizing certain human actions and behaviors, and prescribing sanctions for such behaviors and the manner of imposing and executing them. This function of criminal legislation, from the scientific aspect, is the subject of criminal law. When defining the concept of criminal law, it has been pointed out that the concept of criminal law is used to convey two meaning. It is used to denote a branch of law as a system of valid criminal law norms and a scientific discipline – the science of criminal law. (Babić, 2014:27). In addition to the previously described, criminal law protection is fully realized by implementing a certain procedure against a person, who committed an offense, which is dealt with by criminal procedural law.

To increase the level of road traffic safety and the protection of people, road-safety-related traffic offenses are prescribed in the criminal legislation of Republika Srpska. The special chapter of the Criminal Code of Republika Srpska[2] prescribes criminal offenses, that is, Article 402 endangering road traffic safety, Article 403 endangering special types of traffic, Article 404 endangering road traffic safety with a dangerous act or means, Article 405 negligent supervision of road traffic, and Article 406 failure to provide assistance to a person injured in a traffic accident. The prescription of this type of offense is completely justified, given that in terms of the suffering of people and property, this type of offense can be regarded as the most serious.

By looking at the offenses contained in this chapter of the Criminal Code, in practice, the most frequent and most recorded offenses are endangering road traffic safety. The following section addresses the basis of this offense as pre-

2 Criminal Code of Republika Srpska (Official Gazette of RS, Numbers: 64/14, 15/21).

scribed by the current criminal law in Republika Srpska, the specificities and characteristics in relation to other offenses and police practice in cases involving this type of offense.

THE OFFENSE OF ENDANGERING ROAD TRAFFIC SAFTY IN THE CRIMINAL LEGISLATION OF REPUBLIKA SERPSKA

The offense of endangering road traffic safety is prescribed by Article 402 of Chapter 31, offenses against road traffic safety, of the Criminal Code of Republika Srpska. The mentioned offense is prescribed in one article through five paragraphs and for the same the basic form is prescribed too, as well as three more serious qualifying forms. The basic form of the offense prescribed in paragraph 1 reads as follows: A road traffic participant who does not comply with traffic regulations and thus endangers traffic safety and the lives of people, and as a result causes serious bodily injury to another, shall be punished by imprisonment from six months to five years.

The more serious qualified form of this offense is prescribed by the same article, paragraph 2, and reads as follows: Perpetrator of the criminal offense referred to in paragraph 1 of this Article, who, during the commission of the offense, was under the influence of alcohol, over 1.50 g/kg of alcohol in the blood, or under the influence of narcotics or who drove at a speed exceeding 50 km/h above the speed limit, shall be punished by imprisonment from one to eight years and the revocation of the driver's license.

Paragraph three of the same article provides for the possibility of imposing a fine or a prison sentence of up to three years on the perpetrator of the offense who negligently committed the offense referred to in paragraph 1.

The same article prescribes two more qualified forms of this offence. A more severe form exists if, as a result of the offence referred to in paragraphs 1 and 2, the death of one or more persons occurred, the perpetrator of the offense referred to in paragraph 1 shall be punished by imprisonment from two to twelve years and revocation of the driver's license, and for the offense referred to in paragraph 2 shall be punished by a prison sentence of three to fifteen years and the penalty of revocation of a driver's license. Paragraph 5 of the same article also prescribes a more severe sanction for the perpetrator of the offense referred to in paragraph 1 in cases involving the death of one person, that is, a prison sentence of one to eight years and the revocation of a driver's license.

Based on the previously stated way in which the offense of endangering road traffic safety is prescribed, it can be concluded that it is a special type of offense whose goal is the safe flow of road traffic.

The provisions of Article 402 provide for the possibility of imposing imprisonment sentence and the revocation of a driver's license for all forms of this offense. [3]

This type of offense differs from other offenses by several characteristics, which are discussed in more detail in the following section.

THE SPECIFICITIES AND CHARACTERISTICS OF THE OFFENSE OF ENDANGERING ROAD TRAFFIC SAFTY IN RELATION TO OTHER OFFENSES

The offense of endangering road traffic safety is quite different from other criminal offenses due to several characteristics. The act of committing this offense consists in non-complying with the regulations on safe participation in road traffic by road traffic participants. The act of committing this offense consists in acting contrary to the regulations aimed at ensuring the normal, smooth and safe flow of road traffic. The two main regulations directly applied to the act of committing this offense are the Law on Basics of Traffic Safety on the Roads in Bosnia and Herzegovina[4] and the Law on Traffic Safety on the Roads of Republika Srpska.[5] The commission of this criminal offense consists in non-observance of traffic regulations and includes various activities and behaviors that represent violations of these regulations. Therefore, the commission of this offence includes any action by a road traffic participant that is contrary to road traffic regulations. This gives a blanket character to this offence, because the criminal code does not determine the forms of its commission, but they result from the prohibitions and instructions contained in the relevant traffic regulations for road traffic participants. These regulations are numerous and are contained in laws, decrees, and other regulations. (Babić, 2014:434). The specificity of this offense compared to other offenses regarding to the commission is reflected in the fact that it is undertaken in public traffic by a road traffic participant.

The consequence of this offence is the endangerment of road traffic safety, which poses a danger to people's lives. The consequence is a concrete danger to the life or body of people, whereby it is expressed through the danger of serious bodily injury or death to another person. In the previous legislation valid until 2017, in addition to the above, the consequence was also expressed through the

3 Until 2017, the ban on driving a motor vehicle was prescribed as a security measure for the perpetrators of this type of offense. With the entry into force of the currently Criminal Code, this measure is prescribed as a punishment for the perpetrator of offenses related to endangering road traffic safety.

4 Law on Basics of Traffic Safety on the Roads in Bosnia and Herzegovina (Official Gazette of BiH, Numbers: 6/06, 75/06, 44/07, 84/09, 48/10, 18/13, 8/17, 89/17, 9/18).

5 Law on Traffic Safety on the Roads of Republika Srpska ((Official Gazette of PC, Numbers: 63/11 and 111/21).

occurrence of a consequence to larger assets, that is, the occurrence of material damage greater than 3,000 KM.[6] For the consequence to exist, it is necessary that someone else, another person as a road traffic participant, is endangered. For example, the offense also exists in cases where another person who was in the same vehicle, including the perpetrator of the offense, is endangered. If the person who caused an accident due to non-observance of traffic regulations suffers physical injuries or dies, then the same event does not have the elements of a criminal offense, but it is an event with the elements of a misdemeanor which falls into road traffic safety.

Regarding the perpetrator of the offense of endangering road traffic safety, there is a specificity that distinguishes it from other offenses. Only a road traffic participant can be the perpetrator of this offense.[7] The perpetrators of these offences are various persons, persons who participate in road traffic every day. The difference in relation to other offenses is that these offenses can be committed by all citizens, that is, by all groups of people, and not only by persons inclined to commit offenses. The perpetrators of these offenses are primary, situational, negligent perpetrators, non-delinquent individuals. This criminal offense can be committed by any person who, in any way, in any form of activity or in any capacity, is found as a participant in road traffic. In practice, it is very rare that the perpetrators of these offenses are persons inclined to commit other criminal acts, such as major crimes or other type of crimes. Also, in practice, it rarely happens that the perpetrators of these offenses are recidivists, that is, persons who have previously committed these offenses.

This offense, in terms of culpability, can be committed intentionally or negligently. A more severe sanction is prescribed for the willful commission of this offense. Intent constitutes the subjective element and exists when the perpetrator was aware that he was not complying with traffic rules and, as a result, he would or could endanger the lives of people, so he wishes or consents to the occurrence of such consequences. If there are several perpetrators of this type of offense, who committed the same offense, the culpability of one participant cannot exclude or reduce culpability for another offense. In these cases, hidden insanity and significantly diminished capacity is often used. On the other hand, in practice, it is more common that this offense is committed as a result of negligence. If this offence is committed negligently, a milder penalty is prescribed, that is, a lighter sanction in terms of severity. Negligence is the most common form of culpability regarding this offense.

6 The current 2017 Criminal Code of Republika Srpska did not include such a feature of the criminal offense and only prescribed the objective condition for the existence of the offense is the occurrence of serious bodily injury or death to another person.

7 A road traffic participant is a person who drives a vehicle on the road or is in a vehicle or on a vehicle, who drives, leads or rides an animal that moves on the road, as well as a pedestrian or a person who performs his work and work tasks on the road - Article 9, item 76 of the Law on Basics of Traffic Safety on the Roads in BiH (Official Gazette of BiH, Numbers: 6/06, 75/06, 44/07, 84/09, 48/10, 18/13, 8/17, 89 /17, 9/18).

A special feature of this offense in relation to other offenses is the place of commission. Regarding place of commission of this offense, we should start with the definition of a traffic accident. A traffic accident is an event on the road or that started on the road, in which at least one moving vehicle was involved and in which one or more persons were killed or injured or material damage occurred. (Sredić, Mamić, 2022:7). Based on this definition, it can be concluded that this offense can only be committed on the road.[8] A road is a surface intended for traffic. Regarding the road, one can consider a public road or an uncategorized road. A public road is an area of general importance for traffic, which anyone can freely use under conditions determined by law and which has been declared a public road by the competent authority, as well as a street in a settlement. An uncategorized road is a surface used for traffic on any basis, which is accessible to a large number of users (rural, field and forest roads, roads on embankments for flood protection, areas around gas stations, parking lots, etc.).[9] The specificity of the offense of endangering road traffic safety by place of commission in relation to other offenses is evident from the above, which represents only one of several specificities and features.

Also, one of the special characteristics of the offense of endangering road traffic safety in relation to other prescribed offences is the possibility of imposing a sentence prescribed only for this offence. Article 42of the Criminal Code of Republika Srpska[10] prescribed types of penalties, and a specific penalty is the revocation of the driver's license.[11] The revocation of the driver's license, in accordance with the legal basis, may be imposed on the perpetrator who committed the offense of endangering road traffic safety. Such a sentence can be imposed on the perpetrator for a period of six months to five years, and in cases where the death of one or more persons occurred during the commission of this offense, the sentence can be imposed for a period of one to eight years. The duration of this type of sentence is calculated from the day the decision becomes final, with the provision that the time spent serving the prison sentence is not counted during its duration. Also, when imposing a suspended sentence, the court may revoke the suspended sentence in cases where the convicted person drives a motor vehicle. If this penalty is imposed on a person who has a foreign driver's license, such a penalty refers to the prohibition of driving a vehicle on the territory of Republika Srpska. In addition to the prescribed penalty, the current law also prescribes the safety measure of banning a driver from driving

8 A road is any public road and uncategorized road on which traffic takes place - Article 9, item 10 of the Law on the Basics of Traffic Safety on the Roads in BiH (Official Gazette of BiH, Numbers: 6/06, 75/06, 44/07, 84/ 09, 48/10, 18/13, 8/17, 89/17, 9/18).

9 Article 9, items 13 and 33 of the Law on the Basics of Traffic Safety on the Roads in BiH (Official Gazette of BiH, Numbers: 6/06, 75/06, 44/07, 84/09, 48/10, 18/13, 8 /17, 89/17, 9/18).

10 The Law on Amendments to the Criminal Code of Republika Srpska (Official Gazette of RS, Number: 15/21).

11 Since 2017, the then Criminal Code prescribed this penalty as a ban on driving a motor vehicle, and it was changed in 2021 through the adoption of amendments to the aforementioned Code.

a motor vehicle,[12] which was previously prescribed as a penalty. The penalty of revocation of the driver's license and the security measure of banning a driver from driving a motor vehicle cannot be imposed at the same time.

The court can impose the security measure of banning a driver from driving of a motor vehicle of a certain type or category of vehicle on the perpetrator who committed the offense of endangering road traffic safety when there is a danger that he will commit such a criminal offense again while driving the vehicle. The imposition of such a measure implies the revocation of a driver's license or a ban on the issuance of a driver's license during the duration of the imposed security measure. The duration of such a measure is possible for a period of three months to five years starting from the date of the final decision, except that the time spent serving a prison sentence or the time spent in a health institution is not included in the duration of the measure. Also, as with the revocation of a driver's license, this security measure also includes a ban on driving on the territory of Republika Srpska.

POLICE PRACTICE IN CASES INVOLVING OFFENSES OF ENDANGERING ROAD TRAFFIC SAFETY

Theoretically, and practically, there are several ways to obtain information about a criminal offense. (Simonović, Matijević, 2007:51). The police usually obtain information through regular police work, through the reports received by the police body, through the media, through public discussions in the public, reports filed by persons who has been damaged, reports filed by witnesses, reports filed by state, economic and other social entities, reports filed by anonymous persons or reports filed by persons using false name, the so-called pseudonymous reports. When looking at the criminal offense of endangering road traffic safety, the usual source of information are reports by road traffic participants or participants involved in traffic accidents. Receiving a report is one of several police powers, which is prescribed by the current legal regulation. Receiving a report as a police power implies the duty to receive and record a report on all committed offences, misdemeanors or other events and occurrences that are interesting from the aspect of security. In practice, in most cases, reports of this offense are filed by the participants involved in traffic accidents, and as such, they are the most reliable.

In practice, police bodies, in a large number of cases, obtain information about the existence of an offense. On the basis of such information, police bodies continue to perform their criminal functions, independently and in cooperation with other security agencies. Actions undertaken by the police in one state is provided for by valid norms which also prescribe police duties and tasks. Certainly, one of the police tasks is preventing the commission of offences, pre-

12 Article 18 of the Law on Amendments to the Criminal Code of Republika Srpska (Official Gazette of RS, Number: 15/21).

venting the commission of misdemeanors, detecting offenses and misdemeanors as socially unacceptable phenomena, finding and handing over the perpetrators of such phenomena to the competent authorities. Police bodies perform their criminal function by undertaking certain measures and actions prescribed by law, and some of these actions are undertaken on the request of the district prosecutor's office, that is, the district public prosecutor.

As previously stated, the offense of endangering road traffic safety has certain specificities and features in relation to other offenses, both from a normative and theoretical aspect, as well as from a practical approach. In addition to the application of basic regulations when dealing with these offenses, police bodies, in cases of this offense, also apply a number of secondary regulations. The basic by-law is the Instruction on the Investigation of Traffic Accidents.[13]

The first specificity of this offense when dealing with it in practice is immediately upon receipt of the report. Police first learn about this offense, in practice, from the receipt of a traffic accident report. In almost all cases, police first learn about a traffic accident when the participants involved in a traffic accident, road traffic participants or other entities, such as, for example, fire and medical services report an accident on the phone. When receiving a report, the police officer's duty is to collect as much information as possible about the event itself. It is rare to immediately after learning about a traffic accident determine whether it is an offense or a misdemeanor. Also, the specificity of documenting the received report differs in relation to other offenses, considering that the previously mentioned by-laws prescribe an obligation to make special official notes on the receipt of a traffic accident report.

After receiving the report, it is the duty of the police officer to send police officers to the scene of the reported traffic accident without delay, in order to provide assistance to the injured persons, prevent the possibility of endangering traffic safety, and undertake other necessary measures and actions. The most reliable source of information about the event itself and whether it is an offense or a misdemeanor are the police officers who are the first to arrive at the accident scene. In practice, it is almost possible to immediately determine which event it is. The existence of an offense requires death or serious bodily injury to another participant. In practice, the severity of injury of an injured person or persons is rarely known immediately after the arrival of police officers at the scene.[14] The medical staff does not want to declare the severity of injuries of the injured persons immediately after they are admitted. Even in situations where another participant in a traffic accident is seriously injured or has died and when such a fact is fully known, a particular event cannot be, with certainty, qualified as the offense of endangering road traffic safety. Bearing in mind the aforementioned regarding the severity of injuries of the injured par-

13 The instruction is issued by the Minister of the Interior, and the last one has been in force is since 2019.

14 In such cases, police officers independently assess the possible severity of injury based on previous incidents.

ticipant in the traffic accident and the fact that it is not possible to determine which event it is, in practice, when dealing with such events, an on-call prosecutor of the competent prosecutor's office is notified verbally. When notifying the on-call prosecutor, he or she is given the same information necessary for the said event, from the very receipt of the report to further action and the established situation, as well as the fact that the severity of the injuries is not known. In such cases, the on-call prosecutor usually authorizes police officers to conduct an investigation and undertake other necessary measures and actions. Cases when the prosecutor himself of herself personally arrives at the scene and manages the investigation are rare.[15] If after the investigation, that is, after the event about which the on-call prosecutor has been informed, it is established on the basis of medical documentation that it was a traffic accident with elements of a misdemeanor; the investigation is concluded according to the misdemeanor procedure. In cases where, on the basis of the investigation conducted, other measures and actions undertaken, as well as medical documentation, it is established that an offense has been committed, then a report on the offense committed against the suspect is submitted to the relevant prosecutor's office. On the other hand, in practice, there are cases when it is determined that a certain event has elements of a criminal offense, but, based on the measures and actions undertaken, the responsibility for the commission of the offense cannot be fully established. In such cases, the police submit a report on the measures and actions undertaken to the competent prosecutor's office, so that the same, based on the order issued by the prosecutor's office, is submitted so that further action may be undertaken, that is, forensic examination. After forensic examination has been conducted, an opinion and finding is given on the responsibility of the event itself.[16]

After the necessary measures and actions have been undertaken upon receiving the report and going to the scene, an investigation begins. An investigation is an evidentiary action prescribed by the criminal procedure code, which consists of the direct observation of changes that occurred at the crime scene, which is undertaken by the competent authority. In theory, there are different approaches to defining the term investigation – definitions of investigation in procedural law, definitions of investigation in criminalistics and a specific definition of investigation as a system of actions (Lipovac, 2008:193). A commonly accepted definition defines an investigation as a system of several activities applied on the basis of the Criminal Procedure Code[17] with the application of criminalistics and technical and tactical methods and means, whose task and

15 Even in situations where it can be determined immediately on the spot that it is an event with elements of an offense, the prosecutor authorizes police officers to independently carry out inspections and undertake other necessary measures and actions.

16 In practice, for almost all incidents of traffic accidents that the competent prosecutor's office receives from the police, an order for forensic examination is issued and the same is finalized based on the expert's findings and opinion.

17 Criminal Procedure Code of Republika Srpska (Official Gazette of RS, Numbers: 53/12, 91/17, 66/18 and 15/21).

goal is to find, secure and preserve all criminal and legally relevant material information to be used at further criminal proceedings (Simonović, Matijević, 2007:421). Criminal and legally relevant material information refers to objects and traces of crimes, as well as other situations resulting from a specific crime. Regarding traffic accidents, in practice, in the majority of cases, the investigation is conducted by police officers, that is, authorized law enforcement officials. In accordance with the applicable by-law, in practice, the investigation of traffic accidents with elements of a misdemeanor is carried out by uniformed police officers, while the investigation of traffic accidents with elements of a criminal offense is carried out by traffic accident investigation inspectors[18] or a criminal inspector[19] and a police officer who has completed a course in traffic accident investigation or criminal investigation technician. At the scene of a traffic accident, the investigation is carried out in two phases, which are known in theory and practice as static and dynamic. In the first phase, an inspection of the wider and narrower areas of the scene of the traffic accident is carried out, and after that photographs of the situation found on the spot are taken without prior marking. The first phase of the investigation is carried out on the basis of the situation found, interviews with the participants in the traffic accident, possible witnesses and mental reconstruction of the occurrence of the traffic accident. [20]After the first phase, that is, after undertaking the previously described, the marking and fixating of all trace evidence found at the scene of the traffic accident, which can be linked to the occurrence of the traffic accident, and then photographs of the wider and narrower areas of the accident scene are taken.[21] Photographs of the scene are usually taken according to the chronology of the occurrence of the traffic accident. Photographs of certain traces at the accident scene are taken with the help of a scale, and in this way proper fixing and documentation is carried out. Such photos can be used in the further course of the proceedings, depending on the need.[22] The goal of each photograph is to permanently record, that is, preserve the situation encountered. Photography has the task of showing all the elements at the scene of the traffic accident. On the basis of photos taken at the scene photo documentation is created, which is an integral part of the investigative documentation. In addition to taking photographs at the scene, sketching is also done as an integral part of the investigation. Sketching is done with a prior determination of one of the scientific methods regarding road recording if it is a curve. Also, the basis of sketching

18 In traffic police departments where such posts are systematized.

19 In police stations of general competence, where the post of inspectors for the investigation of traffic accidents have not been systematized.

20 Upon arriving at the scene and observing the condition of the vehicle, traces and other important features, a mental reconstruction of the occurrence of the traffic accident can be created, which is the basis for further investigation and taking other measures and actions at the scene.

21 Marking and fixating the trace found at the scene is carried out with the help of arrows, chalk, by placing position numbers and in other convenient ways.

22 An example of the use of such photographs is during forensic examination of the traffic accident.

is the determination of the fixed point, the starting point of the measurement and the orientation direction. As a rule, during the investigation of a traffic accident, a sketch of the scene is created. Sketching is a simple, comprehensive, graphic representation of the situation found at the scene (Lipovac, 1994:26). The sketching of the traffic accident is done at the scene, and at the same time it forms an integral part of the accident scene documentation. Sketching has various advantages in relation to the creation of other elements of the accident scene documentation, and some of them are simple and quick drawing, the appearance of the traffic surface, the situation found and the mutual position of traces, objects and the traffic surface are shown in a simpler way, and the sketch shows the original results of all measurements that were carried out at the scene. In addition to the advantages, there are also certain disadvantages. The sketch does not provide general information about the traffic accident, it is not clear to a wider circle of users; it is not faithful considering that it is a freehand drawing. In addition to the sketches, an integral part of the accident scene documentation is the situation plan, that is, the scale drawing. Situation plans – a scaled drawing technically correctly, graphically, faithfully depicts the situation found at the scene (Lipovac, 1994:26). Such drawings are made on the basis of a croquis sketch made at the scene of a traffic accident. They are made in an appropriate scale, and nowadays they are made using certain computer programs.[23] Also, situation plans have certain advantages and disadvantages. Some of the advantages are that such a drawing separates important from unimportant, the drawing does not contain all the elevations that are not necessary, it faithfully shows the condition found at the scene, considering that it is done in scale, the simplest way is to show the situation found and the mutual position of the objects and traces found at the scene, including many other benefits. On the other hand, there are certain disadvantages, such as a slow production of such drawings, which is done indirectly using sketches and notes; the situation plan does not provide a number of other general data that are important for the traffic accident.

The traffic accident, as well as any work undertaken, is documented in the manner prescribed by the applicable regulations. Documenting the case of a criminal offense begins with the creation of an official note on the receipt of notification of a traffic accident.[24] Upon arrival at the scene, one of the basic and first measures taken by the police officers, and after providing the necessary medical assistance and securing the scene, is a breath alcohol test to determine the presence of alcohol in the body of the participants involved in the traffic accident using a measuring device, and a record is made of the same.[25] In addi-

23 The use of the ScenePD program is more common in practice.

24 This official note is made by the head of the shift or the police officer on duty upon receipt of the report, which states the date and time of receipt of the report, data on the person reporting the incident, data on the type of traffic accident and injured persons if known, as well as the action taken on the report (the referral of police patrols stating the composition of the patrol).

25 When investigating a traffic accident, police officers are required to test the presence of alcohol in the body of the participant using a measuring device, and the report about it is drawn up. This

tion to the above, a report on the investigation of the traffic accident is drawn up, and photo documentation is an integral part of it. Also, in connection with the traffic accident, the questioning of the suspect, including interviews with witnesses, is carried out. Depending on the specific situation, there is a possibility that one of the participants may be questioned as a suspect based on the circumstances of reasonable suspicion of the committed offense of endangering road traffic safety, which is carried out as previously ordered by the district public prosecutor. In addition to the suspect, witnesses, that is, participants in the traffic accident or other persons whose statements can contribute to the proper documentation of the offense are questioned too.[26] In addition to the aforementioned documentation of the measures and actions undertaken, there are other measures and actions undertaken that are documented in a certain way, such as the extraordinary technical inspection of the vehicle, taking a blood and urine sample, and other measures and actions undertaken. After documenting all measures and actions undertaken, a report is drawn up and submitted to the competent district public prosecutor's office. A report on the criminal offense committed against a specific person or a report on the measures and actions undertaken may also be submitted. Which report will be submitted is ordered by the competent prosecutor, depending on the specific event.

CONCLUSION

The above indicates that the offense of endangering road traffic safety differs from other offenses in many respects. First of all, the place of the commission of the offense is only possible in road traffic, which is not a basis for other offenses. Also, there is a special feature in terms of commission. This offense can only be committed by a road traffic participant, which again can be any person, including a person who does not belong to the criminal milieu.

The position of the legislative authority regarding this offense is also visible in the latest amendments to the current Criminal Code, regarding the prescription of a new penalty that can be imposed on the perpetrator of this offense, the penalty of revocation of a driver's license, as well as the imposition of a safety measure prohibiting a driver from driving a motor vehicle.

There is a certain problem with regard to the procedure itself in the cases involving this offense in practice. Such problems relate to an adequate district public prosecutors' expertise. Often in practice there is a lack of understanding

is done on the basis of valid legal regulations and by-laws. Also, there is a possibility to exclude urine and urine samples, which is done on the basis of a special rulebook and according to a special procedure.

26 In practice, in certain situations, the prosecutor will not order the questioning of the suspect until the expert examination of the case of the traffic accident is carried out and the responsibility of the same is determined based on the expert's findings and opinion, after which the prosecutor independently conducts an examination or orders authorized officials to do so.

between the prosecutors and police officers regarding the necessary procedure. Such a problem itself leads to the further end of the process in cases involving this offence.

This offense can be highlighted as one of those that are present, but not so often present in the daily work of competent authorities. However, there are a number of situations that do not have the elements of a criminal offense upon receipt of the incident report and the first action taken regarding this incident. In such situations, after receiving certain documentation, primarily medical, and after taking all the necessary measures and actions, the event is reclassified as an offense. Such a statement can highlight the need and obligation, in cases where there is no partial certainty whether a certain incident has elements of a misdemeanor or an offense, to act as if it has elements of an offense. It is important to take all the necessary measures and actions that are necessary in the further procedure. Any action undertaken in cases where it is not known whether it is an offense cannot be redundant.

Also, one of the problems in practice, which is presented in this paper, is the investigation of traffic accidents and the handling of cases involving this criminal offense. In Republika Srpska, since 2015, with the entry into force of new by-laws, there has been a reorganization of police stations for traffic safety, which exclusively carried out traffic control and safety tasks, and thus acted on reports of traffic accidents and continued to take the necessary measures and actions. Today's problem regarding the investigation of traffic accidents is the issue of who is competent to investigate traffic accidents – police officers who perform patrol activities or inspectors of the criminal police. This type of problem exists in police stations of general competence. This is defined by the by-law; however, the lack of criminal inspectors leads to certain difficulties when it comes to dealing with reports of traffic accidents. Also, one of the problems is the inadequate expertise of police inspectors in carrying out investigations and further undertaking the necessary measures and actions, which leads to the question of what quality of investigation documentation can be expected.

Based on theoretical and practical experiences, it can be concluded that there is a need for continuous professional development of police officers who investigate traffic accidents and document cases of this type of crime, that is, police inspectors and crime scene technicians. In addition to the necessary knowledge in the field of traffic safety, dealing with these criminal offenses also requires certain level of knowledge about criminal law and criminal procedural law. Also, one of the good ideas in this regard is the joint training of police officers and district public prosecutors, as well as the adoption of joint positions regarding individual actions in cases involving this type of offense.

REFERENCES

Бабић, М. (2014). Кривично право – општи и посебни дио, Бања Лука: Висока школа унутрашњих послова Бања Лука.

Закон о кривичном поступку Републике Српске, *Службени гласник РС* бр. 53/12 и 91/17.

Закон о полицији и унутрашњим пословима, Службени гласник РС бр. 57/16, 110/16, 58/19 и 82/19.

Кривични законик Републике Српске, Службени гласник Републике Српске бр. 64/17 и 15/21.

Липовац, К. (1994). *Увиђај саобраћајних незгода – израда скица и ситуационих планова.* Београд: Виша школа унутрашњих послова.

Липовац, К. (2008). *Безбедност саобраћаја.* Београд: ЈП Службени лист СРЈ.

Симоновић, Б., Матијевић, М. (2007). Криминалистика тактика. Бања Лука: Интернационална асоцијација криминалиста

Средић, З., Мамић, Н. (2022). *Практикум IV Закони из области безбједности саобраћаја БиХ и РС.* Бања Лука: Атлантик.

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Review of the book Identity, Conflict, Security - Hate Crimes in Bosnia and Herzegovina by Velibor Lalić

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The monograph *Identity, Conflict, Security - Hate Crimes in Bosnia and Herzegovina* is the first book by Velibor Lalić, which essentially presents the author's doctoral dissertation defended at the Faculty of Security, University of Belgrade. In his book, which captivates the reader with good writing flow, Lalić deals with a topic that deserves special attention in Bosnia and Herzegovina. Indeed, hatred is an inexhaustible driver of many crimes committed in the name of religion or protection of their people in Bosnia. The author points out that many crimes were committed in the name of hatred, about which the most convincing sentences were written by Ivo Andrić, whom even Lalić could not ignore by quoting the Nobel laureate on several occasions.

In the book whose subtitle speaks most about, the author explains that "hate crimes, in a conceptual sense, are conflicts between different collective identities that create a very intense security dynamic." These are the key words (crime and hatred) and characterize the decades-long conflicts in Bosnia and Herzegovina during the entire previous century. How to stop the spiral of crime in a country where members of its own people have caused more harm to each other than all the foreign armies? The war in the 1990s seems to have been a continuation of the previous one, the war in 1940s, that is, the Second World War, which seems to have left behind many "unpaid bills" in Bosnia and Herzegovina. The interlocutors testify to this in the author's research, which is the most valuable part of the book. The parallels between the two wars are very convincing and will certainly evoke memories in the readers who have heard similar stories from their elders, those who remember the armies that passed through Bosnia and Herzegovina between 1941 and 1945. It is as if nothing has changed in inter-ethnic relations and as if there is not even a little less hatred. The only question is whether it will have the opportunity to manifest itself as a crime again.

In addition to the introductory part, the book consists of four chapters: Definitions and Methodological Framework; Bosnia and Herzegovina: Identity and Conflict; Security Implications of Hate Crimes in Bosnia and Herzegovina; Identity, Conflict, Security – A Critical Review. The author uses 214 references in the 218-page e-book written in Cyrillic script, A4 format.

The book *Identity, Conflict, Security - Hate Crimes in Bosnia and Herzegovina* is written in an accessible, easy-to-understand manner, but it is also based on a scientific view and understanding of security issues. The author explains the emerging forms of hate crimes, vulnerable groups and points out the perpetrators and their motives as well as the consequences. The key and unforgettable metaphor, which Lalić rightly points to, is the "line of separation".

Why and what Lalić says, readers will discover in the book, which will surely have a wider resonance among the expert public. All of the above are the reasons why I recommend Lalić's book *Identity, Conflict, Security - Hate Crimes in Bosnia and Herzegovina* for publication and as a desirable tool for learning/teaching process.

Lalić writes in a clear, easy-to-understand style even when he discusses difficult situations and experiences. Not a single aspect was neglected, not a single side in the "Bosnian pot" was favored. We hope that the book will contribute to better understanding of misunderstandings in inter-ethnic relations and unforgettable memory of the crimes the warring parties committed against one another, unfortunately, on several occasions.

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  Viktimološkog društva Srbije-Žrtve kriminaliteta i žrtve rata: međunarodni i domaći kontekst, knjiga apstrakta (p. 13). Beograd: Viktimološko društvo Srbije & Prometej.
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2. ***Review article*** presents an overview of recent articles regarding a specific topic with the aim of summarizing, analyzing, evaluating, or synthesizing the main ideas arguments and findings, with new syntheses that must encompass the results of the author's own research.
3. ***Short communication*** is a short article or a preliminary study which does not have to include all the IMRAD elements. It summarizes the findings of the author's completed original research or article still in progress.
4. ***Article critique or response paper*** is a discussion of a certain scientific topic, based exclusively on scientific argumentation, in which the author expresses his/her opinion which must be supported with evidence, that is, confirms or disproves the findings of other authors.
5. ***Informative review*** such as editorials or commentaries.
6. ***Review*** is an evaluation of a book, instrument, computer program, case, or a scientific event. It evaluates the correctness/incorrectness of a scientific paper, criteria, or starting points, with a particular emphasis on the quality of the work evaluated.

- When reviewing the article, the reviewers should consider the following:

1. Does the article fit the scope of the Journal of Security and Criminal Sciences?
2. Does the title clearly describe the article?
3. Does the article adhere to the journal's standards?
4. Does the article in the relevant category have all the necessary elements (for example: original research article – introduction, methods, results, discussion, conclusion)?
5. Are tables and figures easy to interpret and understand?
6. Are the sources cited in accordance with the Instruction for authors?

- Other notes (Article 35, items 2, 4 and 6)
  1. Articles are evaluated descriptively.
  2. Reviewing form must be signed if it is in printed form and sent to the editorial office via email for each article reviewed.
  3. Reviewers are required to point out possible violations of ethical standards in the work.
  4. Reviewers should provide a full reference to a representative single author/co-authored articles from the narrower scientific field, such as the work they have reviewed.