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Identifying Factors Influencing the Martial Arts Athletes' Performance

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***Abstract*—This study aims at investigating the martial arts athletes' influential factors that correspond with their professional performance when competing in the various matches. 320 martial arts athletes who are officially joined in the Indonesian National Sports Committee (*Komite Olahraga Nasional Indonesia*) Registry of Central Java Province, Indonesia supervision participated to be the respondents. Data were collected from the self-rated questionnaire of the martial arts athletes' personal experience using a 5-Likert scale. Meanwhile, data analysis statistically applied for the descriptive and factor analysis tests. This quantitative method was used to measure the martial arts athletes' influential factors that accommodated the variables of self-confidence, anxiety, motivation and concentration. The findings showed that the principal component analyses determined the presence of 4 variables with the Eigenvalue outreaching 1, positioning 36.8%, 22.4%, 21.7%, and 18.9%of the variances accordingly. This guided the factorial analysis that claimed 2 extracted components with a total of 59.27% of the variance. The component 1 was 36.84% and component 2 was 22.42%. The interpretation of these components is suitable with the pilot outputs undertaken from the martial arts athletes' influential factors scale, in which the component 1 shows the positive affect items and the component 2 partially indicates the negative affect items.**

Keywords: factor analysis, influencing factors, martial athletes

I. INTRODUCTION

Sport activities play an important role in the athletes' lives as they can represent the accomplished ways to decrease the negative phenomena and possible psychological problems, and have a higher level of self-confidence [1]. Sport is recently defined as a concept of developing individuals' understanding and sense of responsibility which encourages athletes' cooperation. It strengthens the athletes with the social groups and the community and harmonizes the individual-family and individual-community relations [2]. Talking about this concept, hence athletes' performance will depend on a variety of the physiological and psychological factors, such as self-confidence, anxiety, motivation, and concentration. When a performance is lacking, frequently an athlete says, "I just did not play with my all out efforts and potential". Or further, as considered to be a bad day, a lack of preparation, some athletes do not simply perform their tough skills; they usually attribute it as their nerves [3].

To go further, for example, identifying a good performance in the martial arts needs some rigid indicators. This has been pointed out that the martial arts complexity possibly faces great difficulties to merge the influencing performance variables [4]. Hence, [5] believed that athletes will be realistic in indicating their expectations, focusing on the performance, positive emotions, motivation, arousal and social supports. This belief addresses the positively global self-esteem that contributes sense of sport-confidence and achievement motivation, setting goals and psychological readiness [6] as indicated among the martial arts athletes. Upon the aforementioned performance identification, the intensity of self-confidence supposes to be the crucial aspect for the athletes in engaging any mental training program initiation effectiveness. This initiation may potentially eliminate the specific performance problems [7] among the athletes, as concerned the athletes' self-confidence can be effectively influenced from the coaches [8] capacity, credibility, and commitment when athletes perceive high self-confidence and efficient self-perception, as well as believe in their abilities, hence these will enhance their motivation to perform [9].

So far, athletes' self-confidence played a mediating role in the relationship between perceived motivational climate and perceived success [10]. [11]-[12] state that the self-confidence conveys the characteristics of mental toughness. The motivational climate has a direct effect on the perceived success and the relationship significantly as mediated by athletes' self-confidence [10]. So, high self-confidence is perceived to be positively and significantly correlating with the athletes' intrinsic and extrinsic motivation whereas low self-confidence can make athletes incapable of facing any reasonable practices in some matches. However, athletes' distrust to their abilities might lead them to be unmotivated [9].

Further, to support athletes' self-confidence, we are endorsed to deal with athletes' anxiety that can negatively trigger their sportive performance prior to heading their competitors [13]. As empirically found, when athletes' experience with their ineffective statement becomes an anxiety, automatically their peak performance may suffer from an unnecessary excessiveness of being nervous that may impact to the future performances [3]. To be concerned, athletes who have a small number of competitions level need to be aware of their anxiety for the better successes. This should be considered that the high level of being anxiety in individual athletes may be

considered as an advantage in coping with a good control and analysis [14]. Athletes' image of success might create the specific outputs upon which they could concentrate, thereby be delightful with the anxiety symptoms [15]. Pointedly, athletes with the higher levels of any daily life and sports events stress had a reduced sense of athletic performance and more perceived emotional and physical exhaustion as well as devaluation of sports participation [16].

Another fundamental variable of being a performed athlete corresponds with the motivation that is expressed in the special state of psychological tension based on the correlation between perception and thinking. Motivation is based on all the needs and interests for sport performance. Motivation determines the focus of the attention and good will and supports in an energetic way the efforts regarding the preparation and participation in contests [17]. In this respect, motivation may potentially allow the martial arts athletes to commit to practicing some exercises that enhances their performance [18] with the quality of delivering facilities to upgrade athletes' self-confidence as the domain of the autonomy-supportive way [19].

Some studies portrayed the empirical practices on how the martial arts athletes experienced with some influential factors when they compete in the various matches through the amateur and professional caliber. [20] stressed that athletes' anxiety increased since the higher state anxiety ratings led to decreased athletes' performance efficiency because the responding times and mental effort increased, too. Anxiety influenced towards search strategies with the higher skilled athletes who performed in the various matches, as compared with lower skilled ones. The study also suggested that coaches of junior amateur athletes still provided less individual, concrete and reflective feedback. On the other hand, the approach seemed to be less valuable for the athletes' development of technical and tactical skills [21]. Strength and conditioning coaches developed any trusts and respects to influence their athletes' development through the effective instruction, communication and motivation [22].

The objectives of this present study aims at perceiving the influence of contributing factors in the martial arts athletes' performance when they face any amateur and professional matches. In this respect, [23] believed that the technical and tactical movement patterns and overall performance characteristics associated with the successful martial arts matches will contribute to the athletes' best performance. Hence, this study strives to answer the following research questions, as follows: (1) Do self-confidence, anxiety, motivation, and concentration influence to the martial arts athletes' performance when competing in the various matches? (2) What is the most influential factor among the martial arts athletes when facing their amateur and professional matches?

II. RESEARCH METHODS

This study was brought about 320 martial arts athletes who were officially joined in the Indonesian National Sports Committee (*Komite Olahraga Nasional Indonesia*) Registry of Central Java Province, Indonesia supervision randomly selected to be the respondents. The scoring rubric involved a five-point Likert scale for each of the four variables, namely: self-confidence, anxiety, motivation, and concentration. The scaling system was purposely indicative, where 5 = very adequate, 4 = adequate, 3 = moderate, 2 = less adequate, and 1 = poor. This rubric was modified through a rigid content-validation process to adjust the indicators in each variable [24].

The data were collected from the self-rated questionnaire to analyze the martial arts athletes' influential factors when they competed in the various matches during their amateur and professional career. Prior to handling four influential factors, other 50 martial arts athletes had completely filled the questionnaires to obtain the validity and reliability outputs. However, the Cronbach's alpha coefficients gained .649. The results showed that the martial arts athletes' self-confidence was .550, anxiety was 519, motivation was 557, and concentration was .677, whereas, the mean scaled in between 3.480 to 3.720.

Data Analysis statistically examined the descriptive and factor analyses. This quantitative method referred to self-rated questionnaire that was completely fulfilled by the respondents. Hence, the rating scales were based on the total number of the martial arts athletes perceived their own performance.

III. RESULTS AND DISCUSSION

A. Descriptive Analysis

Firstly, the data analysis that corresponded with the martial arts athletes' self-confidence recorded the descriptive and frequencies statistics as shown in Table I and Figure 1. They were displayed in the following sequences: 47 (14.7%) martial arts athletes perceived their self-confidence with the less adequate influence, 109 (34.1%) martial arts athletes indicated that their self-confidence were moderate influence, 108 (33.8%) martial arts athletes showed their self-confidence were adequate influence, and 56 (17.5%) martial arts athletes showed their self-confidence reached very adequate influence when competing in the matches. Empirically, these findings showed that the lowest score of the martial arts athletes' self-confidence was 2.00 and the highest score was 5.00. Meanwhile, the mean gained 3.54 and the standard deviation was .946 (n = 320). The peak perception of the martial arts athletes' self-confidence established *moderate* category with the frequency of 109 (34.1%). The frequencies score distribution of the martial arts athletes' self-confidence was graphically presented in histogram (Figure 1).

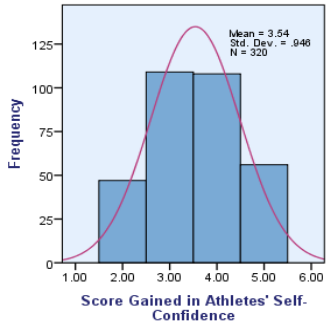

Fig.1. Martial arts athletes score gained in self-confidence

Secondly, the data analysis that corresponded with the martial arts athletes' anxiety results the descriptive and frequencies statistics as shown in Table II and Figure 2. They were displayed in the following sequences: 51 (51.9%) martial arts athletes perceived their anxiety obtained less adequate influence, 100 (31.3%) martial arts athletes' anxiety were on moderate influence category, 115 (35.9%) martial arts athletes' anxiety were adequate influence, and 54 (16.9%) martial arts athletes' anxiety reached very adequate influence when they competed in the matches. These findings showed that the lowest score of the martial arts athletes' anxiety was 2.00 and the highest score was 5.00. Meanwhile, the mean gained 3.54 and the standard deviation was .953 (n = 320). The peak perception of the martial arts athletes' anxiety established *adequate* category with the frequency of 115 (35.9%). The frequencies score distribution of the martial arts athletes' anxiety was graphically presented in histogram (Figure 2).

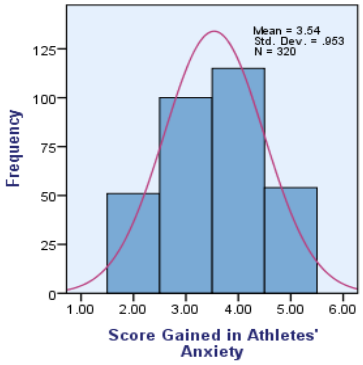

Fig.2. Martial arts athletes score gained in anxiety

Thirdly, the data analysis determined the martial arts athletes' motivation through the descriptive and frequencies statistics (Table III and Figure 3), as described in the following sequences: 38 (11.9%) martial arts athletes perceived their motivation gained inadequate influence, 109 (34.1%) martial arts athletes' motivation were on moderate influence category, 121 (37.8%) martial arts athletes' motivation were adequate influence, and 52 (16.3%) martial arts athletes' motivation reached very adequate influence when they competed in the matches. These findings showed that the lowest score of the martial arts athletes' motivation was 2.00 and the highest score was 5.00. Meanwhile, the mean gained 3.58 and the standard deviation was .899 (n = 320). The peak perception of the martial arts athletes' motivation established *adequate* category with the frequency of 121 (37.8%).The frequencies score distribution of the martial arts athletes' motivation was graphically presented in histogram (Figure 3).

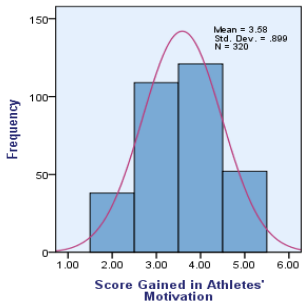

Fig.3. Martial arts athletes score gained in motivation

Fourthly, the data analysis determined the martial arts athletes' concentration through the descriptive and frequencies statistics, as follows: 51 (15.9%) martial arts athletes' concentration gained less adequate influence, 103 (32.2%) martial arts athletes' concentration set the moderate influence, whilst 109 (34.1%) martial arts athletes perceived the concentration placed the adequate influence, and 57 (17.8%) martial arts athletes' concentration attained very adequate influence when the athletes competed in the matches. These findings showed that the lowest score of the martial arts athletes' concentration was 2.00 and the highest score was 5.00. Meanwhile, the mean gained 3.54 and the standard deviation was .963 (n = 320). The peak perception of the martial arts athletes' concentration established *adequate* category with the frequency of 109 (34.1%). The frequencies score distribution of the martial arts athletes' motivation was graphically presented in histogram (Figure 4).

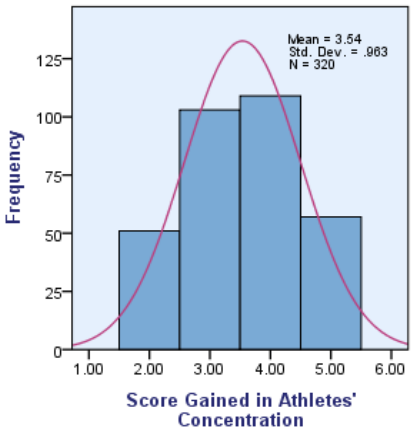

Fig.4. Martial arts athletes score gained in concentration

The martial arts athletes' influential factors empirically constituted four influential variables, namely: self-confidence, anxiety, motivation, and concentration. This study engaged 320 martial arts athletes who officially joined in Indonesian National Sports Committee (*Komite Olahraga Nasional Indonesia*) Registry of Central Java Province, Indonesia supervision. The results of the martial arts athletes' influential factors had four influential variables, as follows: self-confidence (M = 3.5406; SD = .94599), anxiety (M = 3.5375; SD = .95272), motivation (M = 3.5844; SD = .89884), and concentration (M = 3.5375; SD = .96254). The mean and standard deviation results were set in a 5-point-Likert scale to measure the martial arts athletes' performance. Further, the statistics for self-confidence's skewness (-.017) and kurtosis (-.903), anxiety's skewness (-.075) and kurtosis (-.913), motivation's skewness (-.072) and kurtosis (-.755), and concentration's skewness (-.043) and kurtosis (-.947) were inconsiderable for the martial arts athletes' performance when competing in the various matches. Of the skewness and kurtosis results in the martial arts athletes' influential factors, the data accordingly contributed normal. The lowest mean gained in the martial arts athletes' influential factors related to the anxiety and concentration variables, whereas the highest mean was motivation.

B. *Chi-Square Analysis*

This analysis explained the chi-square test for goodness of fit as derived in Table I. This analysis verified four martial arts athletes' influencing factors that constituted their performance when competing in the various matches. The overall difference among the chi-square analysis of the martial arts athletes' perceptions were statistically significant, where χ^2 = 64.500 (2, n = 320), p<.000 for self-confidence, χ^2 = 56.300 (2, n = 320), p<.000 for anxiety, χ^2 = 45.700 (2, n = 320), p<.000 for motivation, and χ^2 = 32.897 (2, n = 320), p<.000 for concentration. The chi-square test for goodness of fit, therefore indicated that there was no significant difference in the majority proportion of the martial arts athletes' influential factors recorded in the sample sizes (n = 320).

TABLE I. CHI-SQUARE TEST FOR GOODNESS OF FIT RESULTS

	Self-confidence	Anxiety	Motivation	Concentration
Chi-Square	64.500[a]	56.300[a]	45.700[a]	32.897[b]
df	2	2	2	3
Asymp. Sig.	.000	.000	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 17.0
b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 14.7

C. Factor Analysis

These four variables referred to the principal components analysis (PCA) results. Before verifying the components, the suitability of the factor analysis data was examined. The correlation matrix inspection indicated the existence of obtainable coefficients of .107 and above, whereas the Kaiser Meyer-Olkin (KMO) value was .612, that passed the recommended value of .6 and Bartlett's test of Sphericity was p = .000 [25] addressing the statistical significance and strengthening the factorability of the correlation matrix. The PCA results inferred the presence of four variables with the Eigenvalue that outreached 1, established 36.8%, 22.4%, 21.7%, and 18.9% of the variances consequently, as shown in Table II. The review of the scree plot addressed the definite part after administering four variables. The scree plot was determined to disapprove two axes for the further study (Figure 4) and endorsed by the parallel analyses. This scree plot conveyed two axes with the Eigenvalue exceeding apropos of advocating the criterion values for an aimlessly carried out of the accessible size of the matrix data (4 variables x 320 martial arts athletes).

TABLE III. DESCRIPTIVE STATISTICS OF MARTIAL ARTS ATHLETE'S INFLUENTAL FACTORS

Variables	Initial Eigenvalue		Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %		Total
Self-confidence	1.474	36.841	36.841	1.474	36.841	36.841		1.089
Anxiety	.897	22.428	59.270	.897	22.428	59.270		1.052
Motivation	.870	21.744	81.014	.870	21.744	81.014		1.069
Concentration	.759	18.986	100.000	.759	18.986	100.000		1.100

Extraction Method: Principal Component Analysis.
a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

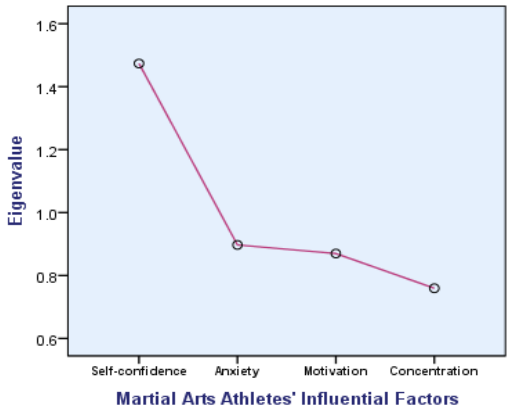

Fig.5. Scree plot of martial arts athletes' influential factors

Another part of the factorial analysis (shown in Table II) referred to two extracted components with a total of 59.27% of the variance. The component 1 was 36.84%, whilst the component 2 was 22.42%. To obtain the interpretation upon the component 1 and 2, the oblimin rotation was verified. The rotated solution performed the presence of simple structure with these components that pointed a number of squared loadings and four influential factors loading substantially on the component 1 only. Further, as shown in Table III, the interpretation of both components was confirmed with the pilot outputs on the martial arts athletes' influential factors scale, in which the component 1 indicated the positive affect items and the component 2, alternatively, partially showed the negative affect items. However, there was a weak negative correlation between the two factors with r = -.03. These analyses supported the function of both positive and negative affect items that were used in the separated scales.

TABLE III. PATTERN AND STRUCTURE MATRIX FOR PCA WITH THE OBLIMIN ROTATION OF INFLUENTIAL FACTORS

Variables	Pattern coefficients		Structure coefficients		Communalities
	Component 1	Component 2	Component 1	Component 2	
1. Self-confidence	**.668**	-.397	N/A	**-.628**	.446
2. Concentration	**.641**	N/A	**-.500**	**.525**	.274
D. Anxiety	**.524**	.822	N/A	N/A	.343
3. Motivation	**.586**	N/A	**.766**	N/A	.411

Note: major loadings for each item were in boldface

IV. CONCLUSIONS

This study empirically conveys the experiential portraits of the martial arts athletes when dealing with their sports performance in the various amateur and professional match levels. Hence, four influential factors, such as the martial arts athletes' self-confidence, anxiety, motivation, and concentration are expected to contribute influence into athletes' sports performance when facing some matches in both amateur and professional levels. These four influential factors can be functionally determined into two criteria, as follows: the descriptive analysis proves that the martial arts athletes' self-confidence was in *moderate* category, whilst other three influential factors, namely: anxiety, motivation, concentration contribute *adequate* category. Descriptively, the martial arts athletes' motivation earn the most influential factor with 121 (37.8%) respondents address this adequate category (M = 3.58; SD = .899; n = 320). On the other hand, the chi-square analysis verifies that the martial arts athletes' perceptions are statistically significant in the majority proportion of the martial arts athletes' influential factors. Last but not least, the factorial analysis concludes that the principal component analysis (PCA) infers the presence of four variables with the Eigenvalue consequently. It means that the interpretation concerns with the component 1 and 2 that are confirmed as the initial results upon the martial arts athletes' influential factors scale, in which the component 1 shows the positive affect items and the component 2, partially indicates the negative affect items.

Furtherance, these influencing factors also mostly addresses some limitations relating to the scope of the athletes' characteristics and the analysis model that relies on the sample size determination. Notwithstanding, the statistical analyses can figure out some empirical facts regarding the martial arts athletes' influential factors that support their sports performance, but these facts have not fulfilled any evidences to be generalized into other studies since the research instrument is merely based on the respondents' self-rated questionnaire that possibly contains to some ambiguities to prove. Hence, upon some empirical facts found in this study, suggestions keep determining the contributing variables or instruments to the next research that may comprehend the martial arts athletes' performance in the future.

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