Component Analysis of Rhythmic Movement Ability Assessment in Virtual Gymnastics Competition

Firdaus Hendry Prabowo Yudho[1], Aisya Kemala[2], Aris Mulyono[3], Maria Herlinda Dos Santos[4], Muhammad Iqbal Hasanuddin[5], Dicky Reva Apriana Sanga Dwi[6]

[1]Universitas Suryakancana, Jl. Pasirgede Raya, Bojongherang, Cianjur District, West Java 43216, Indonesia
[2]Universitas Islam 45 Bekasi, Jl. Cut Mutia, Bekasi City, West Java 17113, Indonesia Indonesia
[3]Universitas Negeri Semarang, Sekaran, Semarang City, Central Java 50229, Indonesia
[4]Universitas Muhammadiyah Bone, Street Tanete Riattang, Bone District, South Sulawesi 92716, Indonesia
[5]Universitas Muhammadiyah Palopo, Jl. Jend Sudirman, Palopo City, South Sulawesi, 91922, Indonesia
[6] Departemen of Physical Education, STKIP Muhammadiyah Kuningan, Street. Syeh Maulana Akbar, Kuningan Districts, West Java Province, 45511 Indonesia
Email: hendri_firdaus@unsur.ac.id

Info Artikel

Abstract

The study aimed to investigate the relationship and influence between following movement (FM) and Movement Technic (MT) variables on general performance (GP) performances conducted by participants in virtual gymnastics competitions (n=361) organized by the Ministry of Youth and Sports during the pandemic in 2020. Research is conducted through quantitative approaches, descriptive analysis and linear regression hypothesis tests to determine the relationships and influences between these variables. The statistical analysis resulted in significant relationship findings and forces between independent FM and MT, variables on GP dependent variables. The study concluded a strong p.977 positive relationship between variables in the influence of ability *to* follow movements on general appearance and a negative .987 negative relationship between motion techniques and public appearance in assessing virtual exercise competition.

✉ Alamat korespondensi: Jl. Pasirgede Raya, Bojongherang, Cianjur District
E-mail: hendri_firdaus@unsur.ac.id

INTRODUCTION

Community health and fitness depends on several factors related to a healthy lifestyle, namely nutritional intake, physical and movement activities, stress levels and management, and adequate rest. Bad habits associated with a healthy lifestyle include

inadequate, excessive, or incomplete nutritional intake (Juliasti et al., 2020), smoking habits (Lim & Ha, 2019), and lack of rest (Wicaksono & Safei, 2020). Although smoking activity does not significantly impact learning achievement at school (Prabowo yudho et al., 2020), this activity has been shown to hurt body health, especially the lungs. The habit of sitting or lying down for a long time also hurts the condition of health and body fitness. It is advisable always to have an active lifestyle and do lots of physical activity rather than spending free time in front of a television or cellphone screen (Gomez et al., 2020; Gomez et al., 2020; S et al., 2020). In the current pandemic, where one of the body's organs that is vulnerable to being affected by the COVID-19 disease is the lungs as the primary respiratory organ (Lv et al., 2020), certain physical activities are needed can maintain the endurance of the respiratory organs. And the body as a whole (Chakraborty & Maity, 2020; Setiawan, 2017).

Physical activity by one's fitness condition and good exercise patterns and regularity can significantly improve body fitness and reduce the risk of sudden death (Koch & Britton, 2008). One good choice of physical activity is to do aerobic exercise, which can increase heart and lung endurance, and in some studies, it has also been shown to increase muscle mass if done with the proper planning and program (Konopka & Harber, 2014). Working conditions that are active but monotonous for long periods are also indicated to reduce the quality of body fitness and, in some cases, can even cause fatal work accidents. This can be minimized by doing recreational activities on the sidelines of the work. With stretching methods, light exercise, and some physical activities that are physically active but fun to do (Mendes et al., 2017).

Some of the principles related to increasing the body's abilities and skills in improving physical fitness are always to keep the following things in mind; namely 1) the individual principle, where each person has different conditions and potential in enhancing their physical quality over a certain period. 2) The principle of specificity, that is, every planned exercise program must have a specific purpose for a specific body condition. 3) The principle of overload where the physical activity carried out should have a portion of the load that exceeds the average ability to stimulate better muscle growth. 4) The principle of progressivity, namely the training load that continues to increase from time to time. 5) The principle of reduction, namely the body's ability to increase, will always decrease with every increase in the body's ability. 6) The principle of turning, which means that the body's condition will always return to its initial condition if no exercise is carried out within a certain period (Sands et al., 2012).

One form of activity that can reduce the impact of an unhealthy lifestyle and at the same time increase endurance and respiratory organs is to do various rhythmic-based physical activities at a specific frequency in a week. The proper rhythmic movement carried out continuously can positively improve the

body's resistance (Georgios et al., 2017). Rhythmic-based physical activity also has a positive influence on students' intrinsic motivation in carrying out learning activities at school in traditional motion materials (Georgios et al., 2017), where teachers are advised to be able to instruct students to carry out moderate to moderate physical activity. for at least 60 minutes per day (Ningthoujam & Nongthombam, 2017). Physical activity that is carried out continuously and periodically can also reduce body weight (Sartono & Adityatama, 2018; Ali et al., 2021) and reduce obesity significantly (Pelclov et al., 2020). Physical activity that uses rhythm as an instrument can increase the intensity and mood of a person who performs the physical activity (Karageorghis & Priest, 2012). Programmed and well-planned rhythmic activities are also highly recommended to be carried out in maintaining physical fitness during the covid-19 pandemic, as one of the suitable and safe methods to do every day (Yudho, Hariadi, et al., 2020), in line with what is suggested by the Ministry of Youth and Sports so that people always maintain their physical fitness by following the Health protocols, one of which is always keeping their distance at every opportunity (Kemenpora, 2020). Aerobic gymnastics is a common and well-known choice for everyone to do regularly because of its positive effect in maintaining body condition and weight (Sientia & Puruhita, 2012). Indonesian people have the habit of doing various physical activities that vary in daily life, from low-level to high-impact

cardio activities martial arts activities, to rhythmic movements with multiple methods and levels of impact on the body (Islamy, 2017). About the level of public perception of the rhythmic activity itself, there are significant differences in perceptions where female people prefer rhythmic movement compared to male people (Yudho, Aryani, et al., 2020).

Based on this, we conducted a data analysis of the results of the stay at home gymnastics competition which was carried out virtually by following the guidelines provided by the Ministry of Youth and Sports during the 2020 COVID-19 pandemic, by following the Health protocol recommended by the government (Ministry of Health of the Republic of Indonesia, 2020). The gymnastics movements carried out are simple aerobic exercise physical activity movements that are widely circulated and informed throughout Indonesia by various online information and social media methods. The data taken is data from the judging results, which was carried out immediately after the deadline for the video of the participants' movements to be collected by the competition committee. This is intended as a mapping and survey of the abilities of virtual gymnastics competition participants throughout Indonesia so that in the future, it can be used as a reference in implementing the same event in the future. There are no standard rules in the evaluation process for gymnastics competitions, both virtual and face-to-face, although the areas that are assessed are relatively not much different. Sometimes the

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components considered in gymnastics competitions that have been carried out so far are still not focused on substantive things such as movement ability but rather on costumes, where this is a subjective variable that is not by the objectives of the gymnastics competition that prioritizes physical ability, or physical component variables that cannot be measured by the naked eye but must use specific tools or instruments, such as the strength of motion, the explosive power of movement, or flexibility of movement. This is the basis for this research so that the assessment process in this kind of subjective physical activity competition can be carried out more objectively and systematically. The best motion analysis at this time is to use various motion analysis tools such as 3D motion software (Issn, 2020).

METHODS

This study uses a quantitative approach with descriptive methods and correlation techniques (Sá, 2013) to determine how much influence the value of the participants' ability (n=361) in following the movement and movement techniques performed on the general appearance value. The research data itself was obtained from the judging results from the official judges of the virtual gymnastics competition, where the data from the Stay at Home (SAH Gymnastics) competition in the form of excel table data from the results of the competition were then grouped into three variables studied, namely

the ability to follow movements (FM), Techniques motion (MT), and generalized movement performance (GP). The data obtained consisted of 393 participants divided into 345 individual participants and 45 group participants. The data is then analyzed using SPSS 23 statistical software to get a conclusion. Descriptive and inferential analysis. Classical assumption statistical tests, correlation tests, and simple regression tests were carried out on research data to obtain correlation results and the form of regression applied to the data.

RESULTS AND DISCUSSION

Results

Descriptive analysis was obtained from research data for mean values for several variables and data categories. The number of individual sample category data n = 325 with a mean value of 72.33 for the Following Movement (FM) variable, 70.23 for the Movement Technic (MT) variable, and 71.21 for the General Performance (GF) variable. The number of group category data is n = 48 with a mean value of FM= 77.06, MT= 76.06, and GF = 77.06.

Frequency

Category			Following Movement	Movement Technic	General Performance
Individu	N	Valid	325	325	325
	Mean		72.33	70.23	71.21
	SD		9.210	9.384	9.191
Group	N	Valid	36	36	36
	Mean		77.06	76.06	77.06
	SD		5.082	5.737	5.667

The results of the data normality test resulted in a p-value of 0.115 for the Individual category residual data and p 0.466 for the Group category residual data with a significance level of 0.005.

Individual category data processed by linearity test between FM and GP variables produced an F value of 1.45 with F - table 0.626, p-value 0.00 at the sig 0.05 level, while group category linearity test data produced an F value of 2,014 in F table 0.313 and p-value 0.00 at a significance level of 0.05.

ANOVA Table of Linearity

Category					df	F	Sig.	F – Tabel
Individu	General Performance Following movement	*	Between Groups	(Combined)	35	202.825	0.000	
				Linearity	1	7049.471	0.000	
				Deviation from Linearity	34	1.453	0.055	0.626255
			Within Groups		289			
			Total		324			
Group	General Performance Following movement	*	Between Groups	(Combined)	13	63.095	0.000	
				Linearity	1	796.063	0.000	
				Deviation from Linearity	12	2.014	0.075	0.313358
			Within Groups		22			
			Total		35			

Individual category data processed by linearity test between MT and GP variables produced an F value of 1.45 with F - table 0.626, p-value 0.00 at sig 0.05 level, while group category linearity test data resulted in F 1.63 value in F table 0.408 and p-value 0.00 at a significance level of 0.05.

Linearity Test Table

Category					df	F	Sig.	F table
Individu	General Performance Movement Technic	*	Between Groups	(Combined)	35	389.147	0.000	
				Linearity	1	13550.197	0.000	0.626255
				Deviation from Linearity	34	2.057	0.001	
			Within Groups		289			
			Total		324			
Group	General Performance	*	Between	(Combined)	14	54.724	0.000	

Movement Technic	Groups					
		Linearity	1	744.947	0.000	0.408506
		Deviation from Linearity	13	1.630	0.154	
	Within Groups		21			
	Total		35			

Based on the results above, it can be concluded that the data processed by the linearity test can be continued to the following linear test stage. Even though the F value for all variables is greater than the table f value, the curve estimation results show a robust linear relationship model data between the variables being tested.

Grafik Linearitas sebaran data
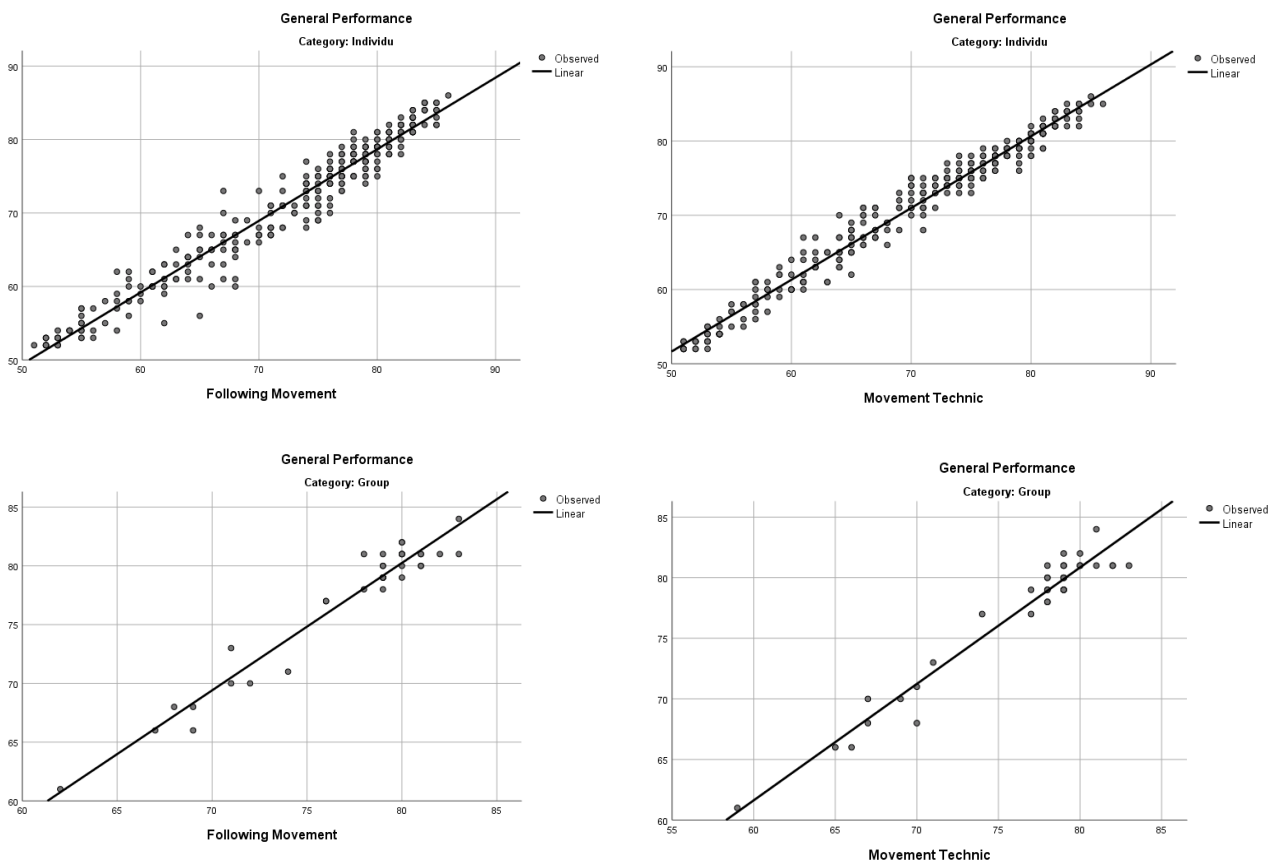
The correlation test results between variables showed a significant relationship in individual categories between FM and GP with a p-value of .977 and a strong relationship between MT and GP with a p-value of .987. Relatively similar results were shown in the group category with a p-value of .972 between FM and GP and a p-value of .973 between MT and GP.

Correlations

Category			Following Movement	Movement Technic
Individu		N	325	325
	General Performance	Pearson Correlation	.977**	.987**

		Sig. (2-tailed)	0.000	0.000
		N	325	325
Group	General Performance	Pearson Correlation	.972[**]	.973[**]
		Sig. (2-tailed)	0.000	0.000
		N	36	36

The results of Linear Regression analysis in individual categories show that the equation Y=1.34+0.346X explains the effect of FM on GP at p-value .000, and MT affects GP at constant equation Y=1.34+0.639X at p-value .000. While the results of the linear regression test in the group category show that the equation Y= explains the effect of FM on GP -2.2+0.537X, at p-value .004, and MT affects GP at the constant equation Y= -2.2+0.498X, at the p-value. 002.

Coefficients

Category	Model		Unstandardized Coefficients	Standardized Coefficients	t	Sig.
			B	Beta		
Individu	1	(Constant)	1.34		2.464	0.014
		Following Movement	0.346	0.346	11.874	.000
		Movement Technic	0.639	0.652	22.357	.000
Group	1	(Constant)	-2.2		-0.664	0.511
		Following Movement	0.537	0.481	3.137	0.004
		Movement Technic	0.498	0.505	3.289	0.002

Discussion

The findings in this study reveal factors that contribute to the appearance of a person's rhythmic activity in general. The aspect of a person's ability to follow the instructor's movements strongly correlates to the achievement of movement performance in general, while for the movement technique variable. However, the results of the inferential test have a negative intercept constant conclusion of -2.2 which means that the movement technique variable will reduce the value of -2.2 from each FM point. The technique in question is the basic technique such as the Footstep Technique, Hand movement, fibre awareness of body movement orientation. It is to be noted that the results of the data taken in this study are judging data which is usually done in every gymnastics competition, both face-to-face and virtual. The consistent negative results that appear in the regression test carried out can be findings discussed further in future research. And can be used as a reference in determining the evaluation variables for competitions and similar rhythmic activity competitions, which are more accurate.

The results of this study are limited to data for the category of individuals and groups of advanced aerobics instructors. More varied

findings may be obtained if research is carried out for the general public. There are still many variables that might be investigated to assess a person's ability in other rhythmic activities, such as what happened in the change in the rhythmic gymnastics scoring scenario carried out by the Federation Internationale de Gymnastics (FIG) during the covid 19 pandemic (Mihaela & Lavinia, 2014). (Gantcheva et al., 2021) also mentions that a person's artistic ability in performing gymnastic movements dramatically influences the overall appearance and assessment of the jury. The ability to follow the rhythm is also another factor that is no less important in executing gymnastic movements according to the instructor's guidelines (Elisana & Vasiliki, 2012). The knocking factor on the music is also one of the determinants of whether or not the performance of the gymnastics participants is good, which also affects the results of the jury's assessment (Toledo et al., 2018). The success of the movement carried out by a person is strongly influenced by several aspects related to the complexity of the body's motor coordination, movement orientation, differentiation, balance, rhythm, and the ability to learn motion (Olajos et al., 2020).

CONCLUSION

Inferential statistics conducted on research data showed a positive influence on individual and group category data. Although the constant in the group category linear regression is negative, adjustments can be made to the X factor included in the equation. The results of this study can be concluded that the variables FM (x1) and MT (x2) are significantly related and have an effect on GP (y), however it is hoped that there will be further research that can reveal factors and other related variables in order to find a formula for assessing activity performance. better rhythm.

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