

# The Influences of Gymnastics and Motivation Toward The Reduction in Body Fat Level

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**Abstract—** The purpose of the study is to know the influences of Zumba towards the fat level reduction in body. This research was done at Studio Gymnast 88 for 12 weeks. The types of the study are quantitative research, experimental method, and 2x2 factorial designs. The research shows that there is a significant difference between zumba and body gym to reduce body fat level, a significant reduction in body fat level between high and low motivation, and influence of motivation in the training exercise.

**Keywords—***gymnastic, motivation, body fat level*

## I. INTRODUCTION

Sport has become a social phenomenon spread all over the world. In fact, the excessive fat is not due to over eating but there is also a fairly complex fabric, among others: genetic factors, never exercise, daily eating habits, hormones, and sex [22]. The excess energy is stored under the skin called the fat. When it is accumulated high, the human will become fat.

When the total amount of fat in body enlarge, the human will be overweight. One way to cope with weight gain and body fat due to unbalanced calories, an effective program to control is to determine the balance between incoming energy and outgrown energy [2]. According to Sumosardjono in 2000, a sports fitness expert explains how to overcome obesity in the best healthy is to set the diet along with exercise in the form of a combination of weight training and aerobics. body fat levels can be said as a comparison between fatty tissue in the body with fat-free body components [23]. This gymnast is useful to lower body fat levels, train cardiorespiratori, muscle strength, endurance, flexibility and balance and this gymnastics can be done by various age groups.

The advantage of doing exercises on weight loss programs is to reduce fat but also can form muscle tissue, and the results will look better at the desired body weight (Sumosardjuno, 2000). From statistics, women who never exercise in their 30s, the fat is about 33%, and at 60 years the fat becomes 42%. Measure the body fat level can be done by using some ways; *underwater weighing, sum of skinfold, and bioelectric impedance.*

The measurement which is done by these methods will show the body mass, the percentage of the fat body and body without the fat.

A motivation is a power in oneself that is very important to reach the goals. Motivation as an internal state of the organism that encourages to do something in this sense motivation means the power supplier to behave in a direction.

The variables of the study involves three variables; independent variables of zumba gymnastics and body language gymnastic, attribute variable that is high motivation and low motivation, and dependent variable that is reduction in body fat level. This research was done at Studio Gymnast 88, Patimura Street, Ungaran for 12 weeks. The study uses experimental method, and 2x2 factorial designs. The study population is the productive age mothers of studio 88. The sample of the study is 40 people taken by purposive random sampling technique.

### A. Research Objectives

In accordance with the above problem formulation then, the purpose of this research is to know:

1. Differences in the influence of gymnastics zumba and gymnastics body language on the reduction in body fat levels in women of productive age Member of gymnastics 88 Ungaran Semarang District.
2. Differences in body fat loss between high motivation and low motivation in mothers of productive age Member of gymnastics 88 Ungaran Semarang District.
3. There is influence of interaction between gymnastics and motivation to reduction of body fat level at productive age mother Member of gymnastics 88 Ungaran Semarang District.

### B. Research Benefits

The results of this study are expected to have the following benefits:

1. Provide information for fitness centers (gymnastics centers) and references for enthusiasts of zumba gymnastics and gymnastics body language for reduction of body fat levels, that exercise and motivation can lower body fat levels.
2. Contributing to the treasures of science for the general public and women in particular, that zumba gymnastics and body language gymnastics can be used as a way to reduce body fat levels.

### C. Theoretical Review

#### **Body Fat Levels and Measurements**

Fats are a group of organic bonds composed of Carbon (C), Hydrogen (H) and Oxygen (O<sub>2</sub>) elements, which have a soluble property in certain solvent-solvent fatty substances) such as petroleum benzene, ether. Fatty tissue contains triglycerides, phospholipids, and cholesterol, each gram contains quite a lot of calories. Actually fat is very beneficial for the human body, fat serves as:

1. Essential components of cell membrane and nerve fibers,
2. It is the main source of energy, where fat provides about 70% of our total energy when in a state of rest,
3. Internal organs supported and wrapped by fat so protected,
4. All steroid hormones are produced from cholesterol, where fat contains the cholesterol,
5. Fat-soluble vitamins can enter the body and are transported throughout the body due to fat,
6. Keeping body heat steady (Larry, Jack and David, 2012).

During this time to measure body fat as a mirror obesity is often used method of body mass index (BMI), by dividing the value of body weight (kg) with height (in meters squared). If the result is  $> 25$ , it means the body is overweight or obese.

#### **Gymnastics**

##### *Zumba Gymnastics*

Zumba is one of gymnastic classes that has movement and music that come from Roman tradition. During doing the gymnastics we will do some movements that get inspiration from salsa, merengue, mambo, reggaeton, tango, chachacha and hip-hop movement [2]. Zumba is one of the most popular gyms around the world, zumba was created in 2001 and then developed, since 2012 zumba became a worldwide trend, and this gym is used more than 185 countries in various parts of the world, zumba is one aerobic gymnastics accompanied by music The thick latin is combined with the salsa, regge, cha-cha, belly dance, flamenco, hip-hop, tango and samba rhythms.

##### *Body language Gymnastics*

Body Language is a combination of several types of exercises that already exist, including forming gymnastics, postnatal gymnastics, jazz base, and ballet. Body Language that prioritizes the movements for flexibility and muscle formation of the body, concentration on the waist and hip. When this exercise is done correctly and appropriately, it can produce a beautiful body shape with good flexibility, in addition to maintaining stamina.

#### **Motivation**

Motivation is a power within a person that is very important in achieving goals, motivation as an internal state of the organism that encourages to do something in this sense motivation means the power supplier to behave in a direction.

## II. MATERIALS AND METHODS

This research used quantitative research. It used field experimental method with 2x2 factorial designs. The variables of the study involves three variables; independent variables, attribute variable, and dependent variable. Details as follows: (1) Independent variable is zumba gymnastics and body language gymnastic, (2) Attribute variable is high motivation and low motivation, (3) and Dependent variable is the reduction in body fat level. All of the data that is needed can be obtained from measuring the motivation and the reduction in body fat level by using *skinfold calipers*. The field experimental method is a method that seeks cause-effect factors, controls events in the interaction of variables and predicts the results to some extent (Winarno S., 1989). This research explained the Influence of Gymnastics and Motivation Against Reduction Body fat level (Study Experiments Zumba gymnastics with Gymnastics body language In the Early Age Productive Mothers members of Gym Studio 88 Ungaran, Semarang).

#### *A. Place and Time of Researcher*

The study was conducted at Studio 88 Ungaran, Semarang. The timing of the study is from 1 August 2016 to 17 October 2016 (Twelve weeks).

#### *B. Population and Sample*

Population is the whole object that become the research attention and the place to generalise research findings (Sandjaja, 2006). The populations in this study were mothers of productive age, which amounted to 55 people. Sample is the part of the population that want to be researched. In this study, the sample is the mother of studio gymnastics members who are productive age, which is 40 mothers from the population number used as a sample. 40 mothers divided into two different treatment groups that are divided according to the motivation that includes 20 low-motivated mothers trained with body language gymnastics and 20 highly motivated mothers trained with zumba exercises. While, 10 other mothers selected randomly. The 40 samples of these mothers also fit into Arikunto's statement in 1996, for experimental research, the sample size is greater than thirty is a large sample. This means that with a large sample of 40 people is quite representative (representative) for the population in this study.

#### *C. Techniques of Collecting Data*

Data collection techniques in this study are by measurement of Motivation and reduction of body fat levels. In preparation for the implementation of the research and data analysis, all the measurement data of the required reduction in body fat level was collected by measuring using *skinfold caliper* [6], as follows:

1. Measure the amount of fat present in the waist (Suprailliaca), by calculating body fat levels. Measuring the body fat level by using this method, we have to know about body *density* and water *density*. We also have to watch the water temperatures that affect the water density. Bellow is the table that explains the comparison between the water temperatures and its density:

TABLE 1. The comparison between water temperatures and the density of water

Temperature (°C)	Density	Temperature (°C)	Density
4	1,00000	31	0,99537
10	0,99973	32	0,99505
15	0,99913	33	0,99473
20	0,99823	34	0,99440
25	0,99707	35	0,99406
26	0,99681	36	0,99371
27	0,99654	37	0,99336
28	0,99626	38	0,99299
29	0,99595	39	0,99262
30	0,99567	40	0,99224

Source: William, Frank and Victor, (2010)

Scout and Edward state in 2009 that this method is used the formula to measure the body fat level,

$$\text{The body fat level} = \left( \frac{495}{\text{density}} - 450 \right) \times 100\% \quad (1)$$

with density is the body mass density. Meanwhile, to look for density, it is needed the formula bellow:

$$\text{density} = \frac{M}{V} = \frac{M_A}{\frac{(M_A - M_W)}{D_w} - V_r - V_{GI}} \quad (2)$$

with M is body mass in kg, V is volume after dividing body mass density by water mass density, M<sub>A</sub> is body mass density in kg, D<sub>w</sub> is water weight that spilled when the body get into the water, V<sub>r</sub> is volume of gas left in the lungs after long breathing, V<sub>GI</sub> is volume of gas in *gastrointestinal tract* [23].



Fig. 1. Skinfold Clippers

For example, a boy who has weight 75.20 kg, when getting in the bath up (full of water), the water spilled 3.52 kg, its temperatures 34°C (water density = 0.99440), the pulmonary residual volume of the lungs is 1.43 liter, volume of an additional subject is 0.1 liter. First step to be done is calculating the body density:

$$\begin{aligned} \text{density} &= \frac{M}{V} = \frac{M_A}{\frac{(M_A - M_W)}{D_w} - V_r - V_{GI}} \\ \text{density} &= \frac{M}{V} = \frac{75.20}{\frac{(75.20 - 3.52)}{0.99440} - 1.43 - 0.1} \\ \text{density} &= \frac{M}{V} = \frac{75.20}{70.55} = 1,066 \end{aligned}$$

Next step is calculating body fat level:

$$\begin{aligned} \text{body fat level} &= \left( \frac{495}{\text{density}} - 450 \right) \times 100\% \\ &= \left( \frac{495}{1.066} - 450 \right) \times 100\% = 14,3\% \end{aligned}$$

This method is considered quite difficult because of the use of many tools and the way to measure is taking much times, besides this method, there is sum method of total skinfold or known as *sum of skinfold*. The application of this method relies on *skinfold callipers* tool to measure the magnitude of fat folds in the skin layer then total the skinfold at the certain point.

Determine the motivation level of mothers in the high motivation category and low motivation by looking at the norm table of assessment sit and reach test by analysing the motivation using method bellows:

- a. Orienting to their inner satisfaction,
- b. Usually do the exercise diligently, regularly, discipline,
- c. Never depending on others,
- d. Having good characteristics, positive minded, honest, sportif,
- e. And having activity permanently [11]

### III. RESULTS AND DISCUSSION

The chapter presents the results of the study and discussions. The presentation of the results of the study is based on statistical analysis performed on the initial test and the final test of body fat levels. The following sequences are presented on the description of data, test requirements analysis, hypothesis testing and discussion of research results.

A group of mothers who received zumba gymnastics and body gym exercises have different body fat levels. The result of the research showed that A1B1, the mothers group who joined body language with high motivation were getting 6,70 reduction. A1B2, the mothers group who joined body language

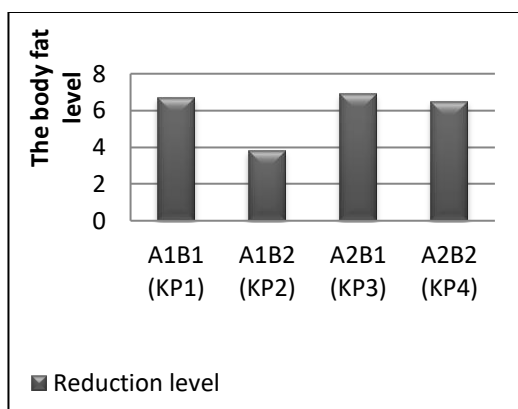


Fig. 2. Histogram average rate of reduction body fat levels each group based on type of exercise gymnastics in gymnastics training and motivation level.

with low motivation were getting 3,80 level. On the other hand, A2B1, the mothers group joined zumba with high motivation were getting 6,90 level. While A2B2, the group joined zumba with the low motivation were getting 6,50 level.

It proved that there is a significant influence between zumba gymnastics and body gym, ( $F_{hitung} = 6.149 > F_{tabel} = 4.11$ ) which is the influence of zumba is better than body language gym. There is also a significant difference of the reduction in body fat level between the mothers whose high and low motivation, ( $F_{hitung} = 4.570 > F_{tabel} = 4.11$ ) which is the reduction in the mothers' body fat level with low motivation is bigger than high motivation. The significant interaction between exercising gymnastic and motivation toward reduction body fat level, ( $F_{hitung} = 7.962 > F_{tabel} = 4.11$ ).

Motivational differences affect the reduction in body fat levels. If between the groups of mothers who have high motivation and low compared, it can be seen that the group of mothers who have low motivation has a reduction in body fat level is better than the group of mothers who have high motivation.

#### IV. CONCLUSION

Based on the results of research and data analysis results that have been done, can be obtained conclusion that There is a significant difference of influence between zumba gymnastics and body gym to reduction of body fat level. There is a significant reduction in body fat level among high motivated mothers with low motivation. Reduction in body fat levels in mothers who have lower motivation greater reduction in body fat levels than mothers who have high motivation only a slight reduction in body fat levels. There is a significant interaction between exercise training and motivation to reduction body fat levels. A group of highly motivated mothers has a significant reduction in body fat levels when trained in body language gym exercises. Groups of mothers who have low motivation have a reduction in body fat levels are better if you get zumba exercise.

#### REFERENCES

- [1] A. Hamidsyah Noer, "Basic Training," IEEE Transl. Keplatihan Dasar Jakarta, Depdikbud, 1994
- [2] Brick, L., "Healthy with Aerobic," IEEE Transl. Bugar dengan Senam Aerobik. PT Raja Grafindo Persada, Jakarta, 2002
- [3] Abdulkadir A., "Principles and Basis of Physical Education," IEEE Transl. Asas dan Landasan Pendidikan Jasmani. Jakarta, Departemen Pendidikan dan Kebudayaan, Dirjend. Pendidikan Tinggi, 1992.
- [4] Dali S. N., "Score Introduction in Education Measuring," IEEE Transl. Pengantar Teori Sekor pada Pengukuran Pendidikan, Jakarta, Gunadarma. 1992
- [5] Edward M. Winter, et al., Short and Exercise Physiology Testing Guidelines "Volume II Exercise and Clinical Testing, London and New York, Routledge 270 Madison Ave, New York, NY 10016, Inc.
- [6] Eri P. D. W. "Test and Measuring of Sport," IEEE Transl. Tes dan Pengukuran Olahraga. Semarang: FIK UNNES. 2000
- [7] Frank W. D., Sport Training Principles, London, A & C Black. 2007
- [8] Gregory W., The Physiology of Treaining, United Kingdom, Elseiver. 2006
- [9] Mahmud, H., "Psychology Education," IEEE Transl. Psikologi Pendidikan, bandung, cv pustaka setiah. 2010
- [10] Harsono, "Coaching and Psychology Aspects in Coaching," IEEE Transl. Coaching dan Aspek-Aspek Psikologis Dalam Coaching, Jakarta, Depdikbud, Dikti P2LPTK. 1988
- [11] Husdarta, "Physic Psychology," IEEE Transl. Psikologi Olahraga, Bandung, Penerbit Alfabeta Bandung. 2011
- [12] Tangkudung, J., "Physic Training," IEEE Transl. Keplatihan Olahraga, Jakarta, Cerdas Jaya. 2012
- [13] Hoffiman J., Norms for Fitness, Performance, and Health, New Jersey, Human Kinestic, Inc. 2006
- [14] Sardiman, M. "Psychology Learning," IEEE Transl. Psikologi belajar, Jakarta, Rineka Cipta. 2009
- [15] Sajoto, M., "Maintaining Physic Condition," IEEE Transl. Peningkatan Kondisi Fisik, Jakarta, Dahara Hrize. 1995
- [16] Khairani, M., "Psychology Education," IEEE Transl. Psikologi Pendidikan, Yogyakarta, Aswaja Pressindo. 2013
- [17] Hagger, M. & Chatzisarantis N., Instrict Motivation and Self-Determination in Exercise and Sport Australia, Human Kinetics. 2007
- [18] Michael E. Symonds, Adipose Tissue Biology Nottingham, Springer. 2012
- [19] Michael J. A., "300 Techniques of Physic Stretching," IEEE Transl. 300 Teknik Peregangan Olahraga, Jakarta, PT Jaya Grafindo Hersada. 1996
- [20] Imran, M. & Ardy N. W., "Psychology Education," IEEE Transl. Psikologi pendidikan, Jakarta, Pustaka Pelajar. 2002
- [21] Powell, M. A., Physical Fitnes Training, Effect, and Maintaining, New York, Nova Science Publisher. 2011
- [22] Sumosardjuno, S., "Movement Correction of Harmful Gymnastic," IEEE Transl. Koreksi Gerakan Senam Yang Membahayakan. Jakarta: PT. Raja Grasindo Persada. 2000
- [23] Scott K. P. & Edward T. H., Exercise physiology: theory and application to fitness and performance seventh edition, New York, McGraw-Hill Companies. 2009
- [24] Sumanto, "General Psychology," IEEE Transl. Psikologi Umum, Yogyakarta, Center of Academic Publishing Service. 2014
- [25] Bahri D. S., "Psychology Learning," IEEE Transl. Psikologi Belajar, Jakarta, Rineka Cipta. 2011
- [26] Bompa O. T., & Haff G. G., Periodiztion, United States of America, Human Kinetics. 2009
- [27] W. L. Kenney, Jack H. W. & David L. C., Physiology of Sport and Exercise, Austin, Human kinetics. 2012
- [28] Soemanto, W., "Psychology Education," IEEE Transl. Psikologi Pendidikan, Malang: Rineka Cipta. 2006
- [29] McArd, W. D, Frank I. K. & Victor L. K., Exercise Physiology, Baltimore, Lippincott Williams & Wilkins, a Wolters Kluwer business. 2010