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YOGYAKARTA SPECIAL DISTRICT SPRINTER PROFILES OF THE YEAR 2009

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ABSTRACT

The aim of this research is to identify somatotype sprinter of Daerah Istimewa Yogyakarta of the year 2009. The research methodology uses a descriptive one with the population with the population and sample amount 25 athletes; they are senior and junior whole in Daerah Istimewa Yogyakarta (18 males and 7 females). The research instrument is using test and measurement by the technique of data analysis descriptive presenting. The result of this research is female sprinter athletes which have ideal body is one person (14.29%), the ideal approach amount three people (42.86%) and far away from ideal amount three people (42.86%). Male sprinter athletes who have ideal body are three people (16.67%), ideal approach amount ten people (66.67%). Ideal bodu for female sprinter is central type that is balance between ectomorph, mesomorph, and endomorph. Ideal body for male sprinter is ectomorphic mesomorphy, that is mesomorph more dominant and endonorphy is bigger than ectomorphy.

Keywords: Somatotype, Sprinter

INTRODUCTION

There are various numbers in athletic branches; among them are running, jumping and throwing. Running, jumping and throwing need different energy requirement. Running requires the strength and speed, jumping requires the strength while throwing requires the good coordination and strength.

Beside that required energy, it needs also the different body types on each branch so that it connects each other and creates some effective and efficient move. It is differed in determining the body types of each athletics branch. The body type determination which precise for athletics branches usually uses anthropometric measurement. Anthropometry is chosen because it uses save methods because it is treated without including any equipment into the body.

This body type and body part measurement by anthropometry is having less precise treatment even though it requires some body type with certain characteristics to achieve the top achievement of each athletics branch. For each athletic branch needs existing harmony with body type comparison and consideration either.

The body type and its quality are the most important thing in doing activities. The body form and its quality will have a positive effect when adapted to activities which is conducted to reach the maximal result. The body type for an athlete of *sprint* represents the determining factor in reaching the achievement because in *sprint* running, besides movement speed and muscle strength, and good coordination it is needed also to consider the matter of body posture, with good body posture combined with the speed and strength hence it can assist the *sprinter* to reach the perfect movement. During the time in Yogyakarta there is no identification of *somatotype sprinter* of whole Daerah Istimewa Yogyakarta. The intention of this study is to identify the *somatotype sprinter* of whole Daerah Istimewa Yogyakarta in the Year of 2009.

LITERATURE REVIEW

Somatotype is a body system which is classified into three categories; *endomorph*, *mesomorphy* and *ectomorphy*. Everyone can be classified into those categories. As for the characteristics of them are: (a) *Endomorphy* is fat body, tending to big on whole parts of the body, short and thick neck, short arm and leg, tending to save a lot of body fat, generally this type has difficulties when doing any physical test, (b) *Mesomorphy* is wide muscles in chest and shoulder, strong arm and leg muscles, has less fat in the body, generally this type has good strength and endurance, (c) *Ectomorphy* is tall and thin figure, narrow body width, small arm and leg, tending to have less fat and has long muscles, generally this type has good flexibility and endurance. (<http://translate.google.co.id/translate?hl=id&sl=en&u=http://www.topendsports.com/testing/somatotype.htm>.)

Besides those definitions above there are also some components in body types referring to kinds, size, and composition of each type, they are:

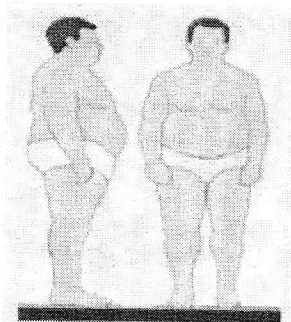


Figure 1.1 Endomorphy Type

Endomorphy Type, generally this type has short arms and legs, generally it has large lung capacity, strong lifting energy and able to increase muscle mass easier so that they are suitable to do any exercise requiring strength, but sometimes they can't do any quick neither continuing movement.

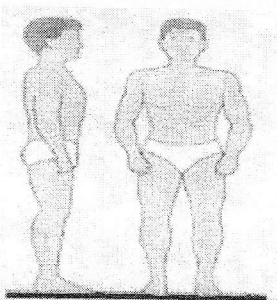


Figure 1.2 Mesomorphy Type

Mesomorphy Type, on this type generally it has good strength and speed, it has good physiological response, able to maintain low level fat, all muscles can receive good progressive training.

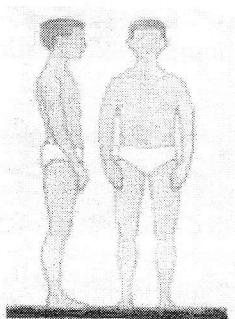


Figure 1.3. *Ectomorphy* Type

Ectomorphy Type, this type has thin and attenuate body, near to some accident, doesn't have strong muscle, narrow chest and stomach, attenuate arm and leg, but with small body condition they can increase the body endurance because of better temperature management in their body. (<http://translate.google.co.id/translate?hl=id&sl=en&u=http://www.brianmac.co.uk/bodytype.htm>)

According to Nancy Clark (2001: 146-147), *somatotype* or body type is differed into three types, they are: (1) *Ectomorph*, with characterization of relatively long arm and leg, short arm and leg fingers, and soft bones' structures, (2) *Mesomorph*, with characterization of developing heavy bones and muscles, wide arms and muscled chest, (3) *Endomorph*, with characterization of soft and rounded body, slim wrist and leg ankle and slim face looking. This is the *somatochart* of *somatotype* diagram

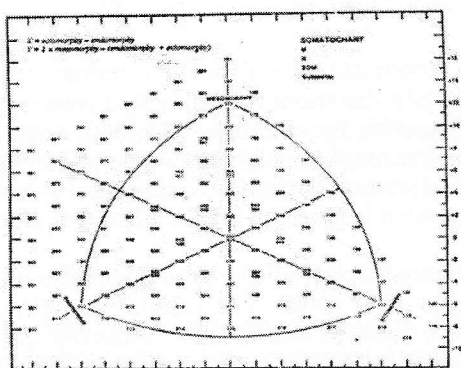


Figure 2.1. Somatochart diagram

Meanwhile, Carter and Heath (1990) stated that body type can be differed into thirteen categories, they are: (1) Central is there is no component differing with one unit to two others, (2) Ectomorphic endomorph is endomorphy is more dominant and ectomorphy is bigger than mesomorphy, (3) Balanced endomorph is endomorphy is more dominant, while mesomorphy is same to ectomorphy, (4) Mesomorphic endomorph is endomorphy is more dominant and mesomorphy is bigger than ectomorphy, (5) Mesomorph endomorph is endomorph and mesomorph is the same and ectomorph is smaller (6) Endomorphic mesomorph is mesomorphy is more dominant and endomorphy is bigger than ectomorphy, (7) Balanced mesomorph is mesomorph is more dominant, while mesomorphy is same to ectomorphy, (8) Ectomorphic mesomorph is mesomorphy is more dominant and ectomorphy is bigger than endomorphy, (9) Mesomorph-ectomorph is mesomorphy and ectomorphy is the same and endomorphy is lower, (10) Mesomorphic ectomorph is ectomorphy is more dominant, mesomorphy is bigger than endomorphy, (11) Balanced ectomorph is ectomorphy is more dominant and endomorphy and mesomorphy are the same and low, (12) ndomorphic ectomorph is ectomorphy is more dominant and endomorphy is bigger than mesomorphy, and (13) Endomorph-ectomorph is endomorphy and ectomorphy is the same.

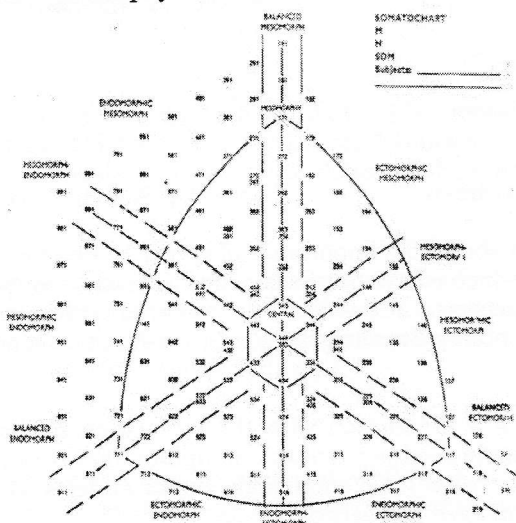


Figure 2.2. Somatotype categories based on Carter and Heath

Based on Kevin Norton and Tim Old (1996: 149), there are three methods in determining the body shape, they are (1) *Anthrophometric* and *photospic* method, that is combining the anthropometry and a picture which is called as size method, (2) *Photospic* method wghich is in the measurement it is made from a picture, (3) *Anthrospic* method which in anthropometry is used to measure the somatotype size.

Anthrophometric method proved that this method is the most precise for various applications. Anthropometric measurement needs data which required to be acknowledged, firstly from the body weight, height, fat thickness, bone wideness and body roundness.

The required equipments are: (1) Weighing-machine, to measure the body weight with accuracy up to 0.5 Kg. the setting used is Kg, (2) Stadiometer, a tool to measure the height of the subject that is body height with accuracy up to 0.1 cm the setting used is Kg, (3) Sliding caliper, a tool to measure the wideness of the bone with the setting is Cm, (4) Measuring ribbon, a tool to measure the circle (body roundness) with the setting is Cm, and (5) Skin fold caliper, a tool to measure the fat thickness with the setting is Mm.

Sprint Definition

Based on Aip Syarifudin (1992: 41) short-distance running or sprint is a way of running where an athlete has to go through certain distances with max that means he/she has to use all of his/her power from the beginning until passing the ending line (finish). According to IAAF level 2 (2001: 20) the sprint running events is going through the distance up from 50 m which is divided senior athletes race indoor only to the distance of 400 m, the needs of every sprint running is the result of strong and fast contraction of the muscles which is changed into smooth and efficient moves which are required by high speed runner.

Sprint as one of the championship's branches which includes all distances up to 400 meters, in which 400 meters is classified as long sprint. The running moves existing on every race included marathon, this is because the race distance increases from shortest distance sprint to further distance. In short distance sprint the demand towards the athletes is changing, athletes race with saved energy supply (non aerobic capacity), this is because the race distance increases so that the demand towards the athletes' non aerobic capacity increases also and the aerobic capacity is starting to be spent. Good *sprint* needs fast reaction, good acceleration and efficient running type, beside that *sprinter* also must develop a good sprint start and maintain the top speed as long as possible, for *sprint* is an explosive race branch hence sprinter shall do the warm-up properly before all training session and competition begin, this is to reduce the muscle tending so that it will not be broken nor pulled (Gerry A. Carr 1997: 13-14).

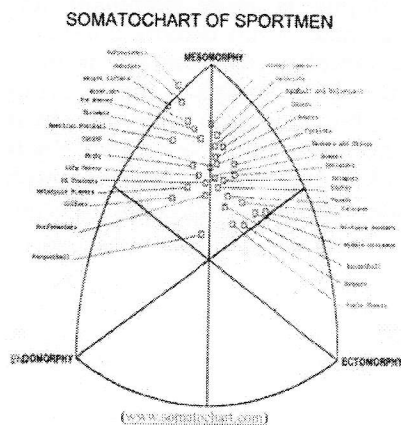


Figure 2.3. Somatochart of Sportmen

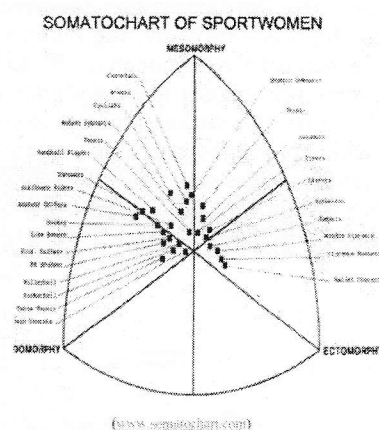


Figure 2.4. Somatochart of Sportwomen

Based on some opinion above, the importance of *sprint* in athletics is a branch of running races which is all running races in which every contributor runs in maximum speed along the distance to go through, the distance is 50 meters to 400 meters, the required powers type in athletic especially the branch of sprint are: Reactive power, Starting power, Acceleration power and power endurance.

RESEARCH METHOD

The research method is a description with the population is the *sprinters* all over Daerah Istimewa Yogyakarta. The sample used is *purposive sampling*, that is sample determination which is based on the IAAF 2007; 102, that is male and female Junior athletes who aged 18-19 years old, and male and female Senior athletes aged 20 years old or above.

The instruments used in the data collection are: (1) Weighing-machine, to measure the body weight with accuracy up to 0.5 Kg. the setting used is Kg, (2) Stadiometer, a tool to measure the height of the subject that is body height with accuracy up to 0.1 cm the setting used is Kg, (3) Sliding caliper, a tool to measure the wideness of the bone with the setting is Cm, (4) Measuring ribbon, a tool to measure the circle (body roundness) with the setting is Cm, and (5) Skin fold caliper, a tool to measure the fat thickness with the setting is millimeter.

On this research the data analysis technique uses the descriptive analysis which is stated by data presentation with regular table and frequency distribution either, lined graphics and stick graphics either, circle diagram, pictogram and percentage of the data analyzed.

Research Result and Discussion

The description about sprinter somatotype is gain by anthropometric measurement including weight, height, and fat component (*triceps skinfold, bicep skinfold, iliocrest skinfold, abdominal skinfold, supraspinale skinfold, fronthigh skinfold, media calf skinfold, mid axilla skinfold*), body size (*arm relaxed girth, flexed and tenced arm girth, chest girth, weist girth, calf girth, gluteal girth*), and bone width (*biepicondularhumerus width, bocondular femur width*).

The Result of Female Somatotype Category

a. Endomorph-Ectomorph

Endomorph-Ectomorph is *endomorph* and *ectomorphy* is the same. On the data collecting which is numbered 7 female *sprinter* athletes of All Over Daerah Istimewa Yogyakarta on the Year of 2009 which then was calculated manually, it is gained 1 athlete who has *endomorph-ectomorph* body type.

b. Balance-Endomorph

Balanced endomorph is *endomorph* is more dominant, while mesomorphy is same to ectomorphy. On the data collecting which is numbered 7 female *sprinter* athletes of All Over Daerah Istimewa Yogyakarta on the Year of 2009 which then was calculated manually, it is gained 3 athletes who have *balanced-endomorph* body type.

c. Ectomorphic-Endomorph

Endomorphic ectomorph is ectomorphy is more dominant and *endomorph* is bigger than mesomorphy. On the data collecting which is numbered 7 female *sprinter* athletes of All Over Daerah Istimewa Yogyakarta on the Year of 2009 which then was calculated manually, it is gained 2 athletes who have *Ectomorphic-Endomorph* body type.

d. Central

Central is there is no component differing with one unit to two others. On the data collecting which is numbered 7 female *sprinter* athletes of All Over Daerah Istimewa Yogyakarta on the Year of 2009 which then was calculated manually, it is gained 1 athlete who have *Ectomorphic-Endomorph* body type.

The Result of Male Somatotype Category

a. Central

Central is there is no component differing with one unit to two others. On the data collecting which is numbered 18 male *sprinter* athletes of All Over Daerah Istimewa Yogyakarta on the Year of 2009 which then was calculated manually, it is gained 5 athletes who have *central* body type.

b. Ectomorphic-Mesomorph

Ectomorphic mesomorph is mesomorphy is more dominant and *ectomorphy* is bigger than endomorphy. On the data collecting which is numbered 18 male *sprinter* athletes of All Over Daerah Istimewa Yogyakarta on the Year of 2009 which then was calculated manually, it is gained 2 athletes who have *Ectomorphic-Mesomorph* body type.

c. Balanced Ectomorph

Balanced ectomorph is *ectomorphy* is more dominant, while endomorphy is same to mesomorphy. On the data collecting which is numbered 18 male *sprinter* athletes of All Over Daerah Istimewa Yogyakarta on the Year of 2009 which then was calculated manually, it is gained 2 athletes who have *Balanced-Ectomorph* body type.

d. Mesomorph-Ectomorph

Mesomorph-ectomorph is mesomorphy and ectomorphy are the same, and endomorphy is low. On the data collecting which is numbered 18 male *sprinter* athletes of All Over Daerah Istimewa Yogyakarta on the Year of 2009 which then was calculated manually, it is gained 3 athletes who have *Balanced-Ectomorph* body type.

e. Balanced Mesomorph

Balanced mesomorph is *mesomorphy* is more dominant, while endomorphy is same to mesomorphy. On the data collecting which is numbered 18 male *sprinter* athletes of All Over Daerah Istimewa Yogyakarta on the Year of 2009 which then was calculated manually, it is gained 3 athletes who have *Balanced-Mesomorph* body type.

f. Mesomorph-Endomorph

Mesomorph-endomorph is mesomorph and endomorph are the same, and ectomorphy is smaller. On the data collecting which is numbered 18 male *sprinter* athletes of All Over Daerah Istimewa Yogyakarta on the Year of 2009 which then was calculated manually, it is gained 1 athlete who has *Balanced-Ectomorph* body type.

g. Endomorphic-Ectomorph

Endomorphic-ectomorph is ectomorphy is more dominant, endomorphy is bigger than mesomorphy. On the data collecting which is numbered 18 male *sprinter* athletes of All Over Daerah Istimewa Yogyakarta on the Year of 2009 which then was calculated manually, it is gained 1 athlete who has *Endomorphic-Ectomorph* body type.

h. Mesomorphic-Ectomorph

Endomorphic-ectomorph is ectomorphy is more dominant, mesomorphy is bigger than endomorphy. On the data collecting which is numbered 18 male *sprinter* athletes of All Over Daerah Istimewa Yogyakarta on the Year of 2009 which then was calculated manually, it is gained 1 athlete who has *Mesomorphic-Ectomorph* body type. One of the supporting factors in achieving sports achievement is body type properly to the demands of each certain sport's branch. Beside that other factors are also influencing towards the achievement achieving: technical, tactical, physical, mental and competing experiential skills.

FEMALE ATHLETES

The somatotype analysis results of female *sprinters* all over Daerah Istimewa Yogyakarta of the Year 2009 are:

Table 18. Research Analysis Result of Female *Sprinter* Athletes

No.	Category	Frequency	%
1.	Endomorph Ectomorph	1	14.29
2.	Balanced Endomorph	3	42.86
3.	Ectomorphic Endomorph	2	28.57
4.	Central	1	14.29
Total		7	100

The ideal body type for female *sprinter* is central type; here is no component differing with one unit to two others (balance among ectomorph, mesomorph and endomorph). The ideal of female sprinters is only 14.29% or 1 person of 7 existing athletes. The athletes closing the ideal, they who tend to have balance are 3 persons (42.86%). Otherwise the athletes avoiding the ideal, which there is none to be the same of 3 components (ectomorph, mesomorph and endomorph) counts 3 persons (42.86%), they are *Endomorph Ectomorph* and *Ectomorphic Endomorph*.

MALE ATHLETES

The somatotype analysis results of female *sprinters* all over Daerah Istimewa Yogyakarta of the Year 2009 are:

Table 19. Research Analysis Result of Female *Sprinter* Athletes

No.	Category	Frequency	%
1.	<i>Central</i>	3	16.67
2.	<i>Ectomorphic Mesomorph</i>	3	16.67
3.	<i>Balanced Ectomorph</i>	3	16.67
4.	<i>Mesomorph Ectomorph</i>	3	16.67
5.	<i>Balanced Mesomorph</i>	2	11.11
6.	<i>Mesomorph Endomorph</i>	1	5.56
7.	<i>Endomorphic Ectomorph</i>	1	5.56

8.	Mesomorphic Endomorph	2	11.11
Total		18	100

The ideal body type for male sprinter is the ectomorphic mesomorph type, that is Mesomorphy is more dominant and *endomorph* is bigger than Ectomorphy. The total ideal male sprinters are only 16.67% or 3 of 18 existing athletes. The athletes closing the ideal, they who tend to have mesomorph more dominant are 5 persons (27.78%). Otherwise the athletes avoiding the ideal count 10 persons (55.55%), they are *Central, Balabced Ectomorph, Mesomorph Endomorph, Endomorphic Ectomorph* and *Mesomorphic Endomorph*.

Of the data above we can know that of the 7 female sprinters from all over Daerah Istimewa Yogyakarta of the year 2009 who have ideal body type is 1 person while of all over those male athletes who have the ideal body type are 3 athletes, the total ideal athletes are less than the total athletes closing or avoiding the ideal of that conclusion that good body posture is not the only factor the running achievement of an athlete, this is influenced by physical, tactical, technical skills, training pattern competing experiences, healthy life style, and athletes' physiological factor.

CONCLUSION

Some matters which can be concluded are total ideal female sprinter is 1 person (14.29%), the athletes closing the ideal 3 persons (42.86%), the athletes avoiding the ideal are 3 persons (42.86%). The total ideal male sprinters are 3 persons (16.67%), the athletes closing the ideal 5 persons (27.78%), the athletes avoiding the ideal are 10 persons (66.67%). So the suggestions which can be delivered based on the research results are: for athletes who have somatotype closing the ideal should improve their desire to practice so that their growth and achievement can be maximized. For the DIY sprinters constructing programs to be having special training to maximize the athletes' growth and the development.

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