# Smoke Behavior And Exercise Duration: Analysis Blood Pressure Increase Of Badminton Player

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ABSTRACT

Background: Blood pressure increase is one of many thing that can be a trigger of infark miocard acute. Now people who play sport also be a smoker. Duration of sport as such burdening heart, moreover with smoke behavior. Certainly it make a serious problem for heart. The purpose of this research to find there is influence of smoke behavior and duration exercise with blood pressure increase.
Method: This research is observational with cross sectional approach, sample use simple random sampling 63 people, type of data involve respondent characteristic, smoke behavior, exercise duration, blood pressure increase, with use questioner and observational paper. This research use logistic regression.
Result: The result of cross tabulation that most of the rsponden who smoke had a increase blood pressure there is 47 people (74,61%), most of the responden who short exercise duration had increase blood pressure there is 41 people (65,08%). Analyze of statistic say there is influence smoke behavior to increase blood pressure (p value 0,000 < α 0,05). There is no influence exercise duration to increase blood pressure (p value 0,174 > α 0,05). Overall shows there is influence smoke behavior and exercise duration to increase blood pressure (p value 0,000 < α 0,05).
Conclusion: Based on result there is influence smoke behavior to increase blood pressure because most of respondent had a long history of smoke who this fact make artery became a narrow, so that pressure of blood flow will be increase. While there is no influence exercise duration to increase blood pressure because the increase more caused from stress and mindset of badminton players who must to be winner in that game.

## I. Introduction

Blood pressure is a very important factor in the circulatory system. Increased blood pressure will affect homeostaths in the body. Blood pressure is always needed for the thrust of blood flow in the arteries, arterioles, capillaries and venous system, resulting in a persistent blood flow. If the blood circulation becomes inadequate, there will be disruption to the oxygen transport system, carbon dioxide, and other metabolic outcomes. In addition the function of the body organs will experience disorder. There are two kinds of blood pressure abnormalities, among others known as hypertension or high blood pressure and hypotension or low blood pressure. Hypertension is a state where the systolic pressure is above 140 mmHg and diastolic pressure above 90 mmHg. This is caused by an increase in cardiac output while the peripheral resistance is elevated due to the autoregulation reflex through the precast valve constriction mechanism These hemodynamic abnormalities are also followed by changes in the structure of blood vessels (blood vessel hypertrophy) and heart (ventricular wall thickening). If it happens in the long term it can cause damage to the arteries in the body until the organs that get blood supply from it like heart, brain and kidney so that will arise diseases such as stroke, aneurysm, heart failure, heart attack and kidney damage (Ina, 2008).

Hypertension plays a role in triggering the occurrence of Acute Myocardial Infarction or better known as heart attack (Rendy & Margareth, 2012). Acute myocardial infarction is a decrease in

the supply of oxygenated cardiac ischemia caused by various things, among others: atherosclerosis, arterial thrombosis, spasm, coronary embolism, congenital anomaly which is a disorder of coronary arteries. Myocardial infarction refers to the destruction of cardiac tissue due to an inadequate blood supply resulting in reduced coronary blood flow (Brunner & Sudart, 2002). One that can affect the increase in blood pressure is cigarettes, Cigarettes are associated with hypertension, although the mechanisms are definitely not known. Smoking is known to have an effect of metabolic changes in the form of growth hormone release and increase fatty acids, glycerol and lactate, leading to a decrease in HDL (High Density Lipid) cholesterol, increase LDL (Low Density Lipid) cholesterol and triglyceride, also serve as a cause of increased insulin resistance and hypersulinemia ultimately leading to heart defects, blood vessels and hypertension and increasing the risk of coronary heart disease and cardiac death (Sianturi, 2004). According to data from the World Health Organization (WHO) in 2011, one billion people worldwide suffer from hypertension, 2/3 of whom are in low- and middle-income developing countries. The prevalence of hypertension will continue to increase sharply, predicted in 2025 as much as 29% of adults worldwide are affected by hypertension. The results of Zamhir (2004) showed the prevalence of hypertension in Java 41,9%, with range in each province 36,6% -47,7%. Prevalence in urban areas was 39.9% (37.0% -45.8%) and in rural 44.1% (36.2% -51.7%). Data from the Ministry of Health showed an increase in smoking prevalence from 27% in 1995, increasing to 36.3% in 2013. That is, if 20 years ago from every 3 Indonesians 1 of whom were smokers, today from every 3 Indonesians 2 of whom are smokers. Smoking is a factor that has a huge impact on the emergence of various diseases. A smoker has a 2 to 4 fold risk for coronary heart disease. A more astonishing fact, if WHO estimates that many smokers in other countries will decline, the number of active smokers in Indonesia is believed to increase to 90 million by 2025.

In a prospective cohort study by Bowman, 2007 at Brigmans and Women's Hospital, Massachusetts on 28,236 subjects with no history of hypertension initially, 51% of the subjects did not smoke, 36% were beginner smokers, 5% smoked 1-14 cigarettes per day and 8 % of subjects who smoked more than 15 cigarettes per day. Subjects were researched and within a median time of 9.8 years. The conclusion in this study is the highest incidence of hypertension in the subjects group with smoking habit of more than 15 cigarettes per day (Bowman et al., 2007). Based on preliminary data retrieval results at badminton club PB. Gajah Mada, PB. Posma, and PB Tugu Sakti in Trenggalek Regency obtained the number of players from all three clubs is 75 people. Where 51 people are active smokers and the remaining 24 are not smokers. After that the researchers observed blood pressure and exercise duration of the players as well as brief interviews with smoking history to 10 people. Then the data obtained where 5 smokers are active and 5 people do not smoke, the duration of exercise average 30- 60 minutes, while the blood pressure from badminton players who are active smokers found increased blood pressure after the practice of badminton between 30-40 mmHg while the players who do not smoking increases between 10 - 20 mmHg. Of the three clubs have similarities that members of the club ever died in the field when playing badminton.

The occurrence of death when playing badminton can be caused by increased blood pressure due to smoking behavior and duration of the practice of badminton players where this can affect blood pressure becomes abnormally high. While high blood pressure is one of the triggers of heart disease, including heart attacks and strokes. They do not really consider smoking is harmful because it has been used to smoking for a long time and have never felt a disorder or a good complaint when being exercising or not. In fact, it is not uncommon for badminton players in the club to think that smoking is supposed to provide additional energy during exercise, of course it is very wrong and dangerous. Quitting smoking is the right way to reduce the risk of hypertension as a trigger for heart disease. Facts mention the risk of heart disease from smoking drops by 50% after quitting one year of smoking and becoming normal after four years of stopping (Brunner & Suddarth, 2002). Attempts to get used to not smoking should start from a young age. Non-smoking counseling should be encouraged both in adolescents and adults where it emphasizes the view and understanding of the dangers of smoking on heart health. And no less important is tobacco advertising should not be too encouraged. Based on the above background researchers interested in conducting research on: "Increased Blood Pressure as Triggers of Acute Myocardial Infarction Viewed from smoking behavior and duration of badminton players training in Trenggalek regency".

## II. Methods

Before the blood pressure measured before and after playing badminton, do the assessment of smoking behavior and duration of each respondent exercise by using questionnaires and observation sheets. After the issue of smoking behavior and duration of the new exercise is done measurement and compare blood pressure before playing and last played badminton.

## III. Results and Discussion

The results presented must be sequential from the main results to the supporting results. Use units of measurement based on applicable international standards. You can add diagrams, tables, pictures, and graphs by completing them with narration.

### 1. The Respondent Characteristics

**Table 1. The of Respondent by Age, Education and Employment**

| Karakteristik | N | % |
|---|---|---|
| Usia | | |
| **<26** | 5 | 8 |
| **26 – 45** | 35 | 56 |
| **>45** | 23 | 36 |
| Pendidikan | | |
| **SD SMP SMA PT** | 2 | 3 |
| Pekerjaan **Pelajar** | 8 | 13 |
| **Swasta** | 15 | 24 |
| **PNS** | 38 | 60 |
| | 5 | 8 |
| | 38 | 60 |
| | 20 | 32 |

**Table 2. The Analysis Data**

| Smoking behavior | Increased blood pressure | | | | Total | |
|---|---|---|---|---|---|---|
| | positive increase | | Negative increase | | | |
| | Σ | % | Σ | % | Σ | % |
| Smoke | 47 | 74,61 | 6 | 9,52 | 53 | 84,13 |
| Do not smoke | 1 | 1,59 | 9 | 14,28 | 10 | 15,87 |
| Total | 48 | 76,2 | 15 | 23,8 | 63 | 100 |

| Duration of exercise | Increased blood pressure | | | | total | |
|---|---|---|---|---|---|---|
| | positive increase | | Negative increase | | | |
| | Σ | % | Σ | % | Σ | % |
| Short | 41 | 65,08 | 9 | 14,28 | 50 | 79,36 |
| Long | 7 | 11,12 | 6 | 9,52 | 13 | 20,64 |
| Total | 48 | 76,2 | 15 | 23,8 | 63 | 100 |

Results of statistical tests Increased Blood Pressure as Triggers of Acute Myocardial Infarction Viewed From Smoking Behavior And Duration of Badminton Players Exercise with logistic regression test can be seen in table below: Based on table 3 it is known that the majority of respondents who smoke increased blood pressure as many as 47 respondents (74.61%) Based on table 4 it is known that most of the respondents whose duration of exercise has a brief increase in blood pressure as many as 41 respondents (65.08%). Based on the Block 1 table on the Omnibus test of model coefficients in the attachment known p value (0,000) <α (0.05) then H0 rejected and H1 accepted which means there is influence of smoking behavior and duration of exercise to increase blood pressure in badminton players in Trenggalek.

### 2. Smoking Behavior On Badminton Players In Trenggalek District

Judging from the results of research on smoking behavior in badminton players in Trenggalek Regency it is known that most respondents are smoking that is 53 respondents (84%). This means that respondents are accustomed to smoking in everyday life whether they are exercising or not, where smoking is burning tobacco which is then sucked its contents, either using cigarettes or using pipes (Saleh, 2011)

Smoking behavior is caused by several things including: Sparkling about smokers As a result of a large-scale campaign of cigarettes in advertising media and print media, more and more men, women, young and old who became smokers, then the ease of getting a cigarette, the price is relatively cheap , and equitable distribution. then the lack of knowledge about the dangers of smoking for health, as well as the assumption that smoking can overcome loneliness, sadness, anger and frustration. And finally the socio- cultural factors such as the influence of parents, friends and groups (Mustikaningrum, 2010)

According to Sadikin et al. (2008) there is a special reason for someone to smoke that is because they are afraid not accepted in their environment if they do not smoke, want to know that much raised by young people, especially female smokers, For the pleasure of many reasons expressed by male smokers. Overcoming tension, is the most common reason, both male and female. Then because the association where because want to please friends or create a pleasant atmosphere, for example in business meetings. And the last is tradition, this reason only applies to certain ethnicities.
Based on the above description, the researcher believes that the number of respondents who entered the smoking category even though the respondents are exercising because they are carried away the atmosphere where the amount of free time while waiting for their turn to play, besides not a few respondents smoked to reduce stress tension before competing against the opponent that he considered heavy. In fact, there is also a suspicious of smoking before the game is a warm up before playing. Of course such excuses are very unreasonable and very dangerous for the respondent himself.

### 3. Duration of Exercise at Badminnton Players in Trenggalek District

Duration or time in sports is the time one takes in doing a sport. A good duration of exercise is performed for 150 minutes in a week or 30 minutes per day (Arinda, 2016). U.S. The Department of Health and Human Services also recommends exercising for at least 150 minutes per week in the form of moderate intensity exercise (such as brisk walking and swimming) or for 75 minutes per week in high intensity sports (such as running, other competition sports). This time can be divided regularly every day. Judging from the results of research on the duration of training on badminton players in Trenggalek Regency note that most of the duration of exercise of respondents in the short category of 50 respondents (79%). Researchers believe this happens because in playing the opponent who faced relatively unbalanced so the game will be finished quickly. While 13 respondents (21%) who experienced long training duration due to chance to meet a balanced opponent so it takes a long time in completing the game.

### 4. Increased Blood Pressure On Badminton Players In Trenggalek District

Judging from the results of research on the increase in blood pressure in badminton players in Trenggalek Regency note that most respondents experienced an increase in blood pressure that is 48 respondents (76%) Increased blood pressure occurs due to many factors such as age, sex, physical activity or exercise, drugs, and race (Kozier et al, 2009). Meanwhile, according to a prospective Cohort study by Bowman, 2007 at Brigmans and Women's Hospital, Massachussets on 28,236 subjects who initially had no history of hypertension, 51% of subjects did not smoke, 36% were beginner smokers, 5% smoked 1 to 14 cigarettes per day and 8% of subjects smoked more than 15 cigarettes per day. Subjects were researched and within a median time of 9.8 years. The conclusion in this study is the highest incidence of hypertension in the subjects group with smoking habit.

From the data of the research result of increasing blood pressure badminton players almost entirely ranged from 10 - 20 mmHg this researcher thinks normal and safe for the respondent because will not at risk of acute myocardial infarction. But there were recorded 3 respondents who experienced increased blood pressure 30-40 mmHg this is certainly at risk of acute myocardial infarction or heart attack on badminton players. From the above description of the researcher argues that the number of respondents who experienced an increase in blood pressure due to the high intensity of movement in the exercise so that the tension also increased, in addition to smoking and duration of play by the respondents there is one thing that is not less play a role in raising blood pressure that is emotion to fight who insist on winning. Emotions and stress when playing where thinking how to win the game will surely increase the blood pressure of the respondents.

**5. Influence of Smoking Behavior Against Increased Blood Pressure On Badminton Players**

From the result of research about the influence of smoking behavior to the increase of blood pressure on badminton players in Trenggalek regency, it is known that most of the respondents who smoked had an increase of blood pressure that was 47 respondents (74,61%) and only 1 respondent (1.59%) No smoking has elevated blood pressure. From the static test results known p value (0.000) <α (0.05), then H0 rejected and H1 accepted which means there is influence of smoking behavior to increase blood pressure in badminton player in Trenggalek Regency. Bowman's research (2007) says that the increase in blood pressure occurs due to smoking habits. Nicotine can increase adrenaline which makes the heart beat faster and work harder, increased heart frequency and increased heart contraction, resulting in increased blood pressure (Tawbariahet al., 2014). While the increase in blood pressure in badminton players who smoke occurs because of the buildup of substances contained in cigarettes and substances into plaque and cover the blood vessels, this is what causes blood pressure in badminton players to increase. Researchers also argue the increased blood pressure of respondents who smoke is still within reasonable limits. Badminton players who smoke their veins must have undergone a change in size due to the influence of smoking. Not to mention the added physical activity by playing bulutngkis, of course this will affect the blood flow to be faster and will eventually increase blood pressure as a clinical manifestation.

**6. Effect of Duration of Exercise Against Increased Blood Pressure on Badminton Players**

Judging from the result of research in cross tabulation about training duration and blood pressure increase in badminton player in Trenggalek regency, it is known that most of the respondents with short duration of exercise have increased blood pressure, that is 41 respondents (65,08%).
And only 7 respondents (11.12%) whose duration of exercise is long experienced increased blood pressure. From the statistical test, p value (0.174)> α (0,05), H1 is rejected, and H0 is accepted which means there is no effect of duration of exercise to increase blood pressure in badminton player in Trenggalek regency. Exercise or physical activity can increase blood pressure, this is due to physical activity or exercise the heart will be heavier because it will pump blood faster than usual to meet the supply of tissue oxygen and organs to perform an activity or physical exercise (Kozier et al , 2009).

From the above description of the researcher believes the duration of exercise either short or long on badminton players can increase blood pressure. So it can be said the duration of exercise is not so significant affect the increase in blood pressure. Increased blood pressure here could be caused by the emotions or stress of respondents who want a victory in a match that causes the increase in blood pressure.

**7. Influence of Smoking Behavior And Duration Of Exercise To Increase Blood Pressure**

In this research, the result of statistical test that is based on Block 1 table on Omnibus test of coefficients model in the attachment is known p value (0,000) <α (0,05) then H0 is rejected and H1 accepted which mean there is influence of smoking behavior and duration of exercise to increase blood pressure on badminton players in Trenggalek regency.

According to a prospective Cohort study at Brigmans and Women's Hospital, Massachussets on 28,236 subjects who initially had no history of hypertension, 51% did not smoke, 36% were beginner smokers, 5% smoked 1 to 14 cigarettes per day and 8% smoked subjects more than 15 cigarettes per day. Subjects were researched and within a median time of 9.8 years. The conclusion in this study is the highest incidence of hypertension in the group of subjects with smoking habits (Bowman, 2007).

Duration of exercise also triggers an increase in blood pressure, both short and long duration. This is due to the activity of the heart's work in pumping and the flow of oxygen-containing blood to the body's metabolism into power will increase so that pressure on blood vessel walls will also rise due to the high blood flowing through the blood vessels (Kozier et al 2009). From the above description the researchers argue that smoking and exercise duration affect the increase in blood pressure because smoking alone will cause narrowing of blood vessels so that blood flow pressure becomes increased. While the duration of exercise both short and long affect the increase in blood pressure researchers think this is because physical activity or exercise will spur the heart's work to supply oxygen to the network so that the flow of oxygen-rich blood flow faster than usual, it causes blood pressure will increase .

## IV. Conclusion

Smoking behavior on badminton players in Trenggalek Regency is known that most of the smoking is 53 respondents (84%) Duration of training on badminton players in Trenggalek Regency is known that mostly in short duration category that is 50 respondents (79%) Increased blood pressure in badminton players in Trenggalek Regency is known that most of the increase in blood pressure that is 48 respondents (76%). Result of statistic test of influence of smoking behavior to increase blood pressure known p value (0,000) <α (0,05) meaning there is influence of smoking behavior to increase blood pressure at badminton player in Trenggalek Regency.

The result of statistic test influence the duration of exercise to the increase of blood pressure known p value (0,174)> α (0,05) which mean there is no influence of exercise duration to increase blood pressure in badminton player in Trenggalek Regency. Result of statistic test of influence of smoking behavior and duration of exercise to increase blood pressure known p value (0,000) <α (0,05) which mean there is influence of smoking behavior and duration of exercise to increase blood pressure at badminton player in Trenggalek Regency.

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