

ANALYSIS OF PHYSICAL EXERCISE AND PHYSICAL FITNESS LEVEL OF INDONESIAN HAJJ HEALTH WORKERS

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Abstract: This study aims to determine the understanding of prospective Hajj health workers regarding physical exercise and performance from the aspects of cardio-respiration, BMI, fat percentage, and body age. This research is mixed methods research that combines quantitative and qualitative approaches with a transformative design strategy. The population of this study were all prospective Hajj health workers in the city of Yogyakarta. The sample used in this study were 31 people. The data collection technique used is observation, written release. Performance data obtained through the Rockport test, BMI, body fat percentage, and age. Qualitative data analysis was carried out through interactive analysis in the form of data collection, data reduction, data presentation, and finally drawing conclusions. Quantitative data analysis uses the average rating to find out the average performance level of prospective haj health workers. shows that the understanding of physical exercise in prospective Hajj health workers increases (from not knowing to knowing). Most of the haj health workers understand more about material on measuring physical fitness, steps of physical exercise, principles of exercise, models of physical exercise, and physical training programs for preparation for hajj. The results of the performance of prospective health workers, there are 71% in the average category based on cardiorespiratory, 48.4% are overweight based on BMI, 61.3% are categorized as normal based on fat percentage, and 71% are in the elderly category based on body age. An understanding of the physical development and performance of prospective Hajj health workers must be prepared and improved in stages, because Hajj health workers do not only work while in Mecca and Medina, but also during preparation for health and fitness coaching.

Keywords: physical training, performance, cardio-respiration, BMI, body age.

INTRODUCTION

Hajj is the fifth pillar of Islam, and it is mandatory for Muslims to perform Hajj at least once in their life if they are financially and physically able (DA. Abdelmoety et al., 2018: 1). Hajj is a series of prayers that combine physical and spiritual activities. According to Auliadina (2019) activities in the pilgrimage are 70% physical activities and the remaining 30% spiritual worship. Judging from its historical background, the Hajj is a lesson of faith in Allah SWT as was done by Prophet Ibrahim, his wife Hajar, and his son Ismail, where they reached the highest level of faith in Allah (Rasyid, 2018).

Worship during Hajj includes walking around the Kaaba, a cube-shaped building in Mecca which is considered the holiest site in Islam, followed by Sa' i i.e., walking between two hills (Safa and Marwa) seven times, each a distance of about 450 m, for a total of 3.15 km. In addition, traveling 14.5 km to the desert of Arafah, the night is spent in Muzdalifah where the collected gravel should be dumped the next day in Mena (about 5 km from Makkah) (Abdullah Al Shieni, 2012:123). As we know, Indonesia is one of the most populous Muslim countries in the world with a population of more than 231 million people (Kemenag RI, 2018) followed by Pakistan and India. This makes Indonesia get a quota of more pilgrims than the Saudi Arabian government. The basic quota for Hajj pilgrims from Indonesia is currently in slot number 211,000, which is divided into 194,000 regular quotas and 17,000 special quotas. The request for additional hajj quota is made because the number of hajj candidates from Indonesia continues to increase every year. In addition, the government also proposed an increase in the hajj quota from 4,100 slots to 4,200 slots (Fiqhislam.com., 2020).

Pilgrims and health workers are dominated by adults and the elderly. As we know that with age, body functions will decrease. Decreased body function can cause problems in the cardiorespiratory system, flexibility, muscle

strength, and muscle endurance. Therefore, Hajj pilgrims and Hajj health workers should prepare well physically, so they can participate in the series of Hajj rituals safely to become a Mabror Hajj (Auliadina, 2019). Indonesian Hajj health workers, have an important role to complete its implementation. The team of Indonesian Hajj health workers who will serve Allah's guests, of course, are required to stay healthy and fit, considering that the task as the Indonesian Hajj health team is very heavy starting from preparation and while in Mecca and Medina, to returning to Indonesia. In addition to being required to have good fitness, Indonesian Hajj health workers also need to understand physical exercise. For this reason, measuring the knowledge of the pilgrims is very important because it will provide evidence that they are really ready to serve the pilgrims as well as possible (Bokhary, 2020). According to Putra (2020) Hajj pilgrims need to prepare physically because most of the Hajj is physical, namely Tawaf (walking around the Kaaba), Sa'i (running slowly from Mount Safa to Mount Marwah and turning around), throwing the jumrah, etc. An understanding of the physical exercise program that has been implemented since the beginning, will contribute to the personal self of the Hajj Health Workers to always maintain his fitness. If the hajj health officer as a change agent who directly handles everything in the field knows well the physical training program, he will be easier to explain to prospective pilgrims to prepare for fitness. This is because the hajj health officer is the right person for the prospective hajj pilgrims. This will be a different view and a big question for prospective pilgrims if the health workers for Hajj do not understand the physical exercise program for prospective pilgrims.

Abd-Ellatif (2021) explains that the health risks that can affect the congregation are not only from geographical conditions, long trips, and hajj activities, but also from the history of the congregation's illness before coming to Saudi Arabia. In order to stay healthy in these conditions and carry out a series of worship properly, officers must provide understanding and education about the importance of preparing for Hajj as well as possible.

As explained by Thirafi (2018), the health readiness of hajj pilgrims can affect their level of anxiety. Some indications of anxiety include shaking, sweating, palpitations, panic, tension, confusion, and loss of concentration. Indeed, the ratio between officers and the number of congregants is inadequate when viewed from the conditions in the field (Abdul Choliq, 2018:39-40). With the limited number of officers, prospective hajj officers must be prepared early in their performance to serve pilgrims well. In addition, hajj officers must know how to serve pilgrims who pay attention to religious rules, fitness levels or various diseases, by protecting their privacy (Ridda, 2019). Hajj activities become an annual agenda, so that improvements in various aspects of service improvement through human resources/hajj officers are always pursued by the government. Hajj officers who have a healthy and fit body need to carry out health and fitness measurements continuously. In addition, it would be very good for prospective hajj health workers to prepare for health and fitness from an early age. However, there are several prospective hajj health workers who have not routinely carried out measurements or preparations related to Cardio-respiratory, Body Mass Index (BMI), fat percentage, and previous body age.

A healthy, ideal body is not only seen from the physical aspect but can also be seen from the 4 (four) basic component aspects of physical fitness, those are cardio-respiration endurance, muscle strength and endurance, flexibility, and body composition (Auliadina, 2019). The way to figure out a person's cardio-respiration endurance is the determination of the intake volume O_2 (VO_2 Max) that a person can use to oxidize nutrient molecules to produce energy. VO_2 Max is the maximum amount of oxygen that can be consumed during intense physical activity until the occurrence of fatigue condition. The VO_2 Max value depends on the condition of cardiovascular, respiration, hematology, and muscle ability. Putra (2020) explained that maximum aerobic capacity or maximum oxygen consumption (VO_2 Max) is the indicator of personal physical fitness. VO_2 Max is the maximum oxygen that can be distributed from the lungs to the muscles of the body in millimeters or minutes/kilograms of body weight. The higher the VO_2 Max, the better a person's ability to exercise and concentrate and be fitter than people with a low VO_2 Max. Auliadina (2019) adds that VO_2 max is determined by some aspects such as age, gender, heart function, muscular aerobic metabolism, exercise habit, genetics, multivitamin, and nutrition statuses such as Body Mass Index (BMI), belly circumference, and fat percentage. Fat percentage becomes one of important factors to determine VO_2 max ability. If someone has higher fat percentage, so VO_2 max ability will lower. In contrary, the higher muscle mass, the higher VO_2 max (Jayanti, 2019). BMI represents a weight adjusted to the height of the body and aims to represent fat mass, fat free mass, and body fluids. Scientific evidence suggests that a high BMI is associated with overweight and obesity that is a predictor for all causes of mortality (Somlak Vanavanan et al, 2018:241). From the data collected by Utami (2021) about Body Mass Index (BMI) condition of Hajj pilgrims in West Java, Indonesia during 2017-2019, found that 45.47%

has normal BMI level, 4.6% has under normal BMI level, 36.36% Hajj pilgrims has above normal BMI level, and the rest 13.54% categorized as obesity. To be a Hajj health worker who is healthy and has high mobility and fast service, prospective Hajj health workers must be able to control their weight.

Considering that the role of Indonesian Hajj health workers is very important in carrying out their duties and providing professional health services, responsive to the needs of prospective pilgrims who will be served, it is necessary to provide Hajj health workers with an understanding of physical exercise, cardiorespiratory performance measurement, BMI, Fat Percentage, and Age.

METHODS

This study uses a quantitative and qualitative approach, with a transformative design strategy. This study aims to determine the understanding of physical exercise and the performance of prospective Indonesian Hajj health workers in terms of the aspects of cardiorespiration, BMI, fat percentage, and body age. The research was conducted at the UNY Sports Building, specifically at the fitness center and track. Understanding Physical exercise for Hajj health workers, in understanding activities that aim to improve or maintain physical fitness. Cardiorespiratory endurance is the ability to continue or endure strenuous tasks involving large muscle groups for long periods of time. BMI is measured by dividing body weight in kilograms by height in meters squared. Fat percentage is the amount of body fat obtained from measurements using the Omron Karada Scan body composition monitor. Body Age is a numerical calculation that shows the age of the body’s metabolic type using the Omron carada scan body composition monitor.

The research population in this study is all prospective Hajj health workers in the city of Yogyakarta, with a total of 31 prospective health workers. Sample with the criteria of prospective Hajj officers who work in the city of Yogyakarta and are registered as prospective officers. The instruments used in this study were: (a) Observation, (b) Documentation, (c) Rockport test, (d) BMI, (f) Percentage of fat, (e) Body age. Cardiorespiratory endurance was tested using the Rockport method, namely sprint or run out according to the maximum ability of the participants with a distance of 1.6 kilometers. The BMI value is obtained by dividing the body weight in kilograms by the height in meters (kg/m²). Body fat percentage and body age measurements were carried out using the Omron Karada scan body composition monitor. BMI is a relatively good indicator of total body composition in population and health-related studies. A person’s BMI can be determined using a nomogram.

Table 1. The Categories of BMI

Category	BMI (kg/m ²)
Skinny	< 18,5
Normal	18,5-24,9
Overweight	25,0-29,9
obesity, Level	
I	30,0-34,9
II	35,0-39,9
III	≥ 40,0

Source: Linda S. Pescatello; associate editors, Ross Arena, Deborah Riebe, Paul D. Thompson. (2014: 64).

Data were analyzed using the SPSS to get an overview of results with its frequency distribution.

RESULTS

Characteristics of prospective Hajj health workers in the City of Yogyakarta based on age and gender. Characteristic data were analyzed using percentage descriptive analysis. The results of the data analysis on the characteristics of the research respondents are as follows.

Table 2. *The Description of Respondents' Age*

Age	Frequency	Percentage (%)
18 – 35 years (early adult)	16	51.6
36 – 55 years (middle age)	15	48.4
56 – 65 years (late adulthood)	0	0.0
Total	31	100.0

The age distribution of the respondents in table 2 shows that most of the respondents are in the early adult age category

The gender characteristics of the respondents are males and females. The results of the characteristics of respondents' gender are as follows:

Table 3. *The Description of Respondents' Gender*

Gender	Frequency	Percentage (%)
Males	15	48.4
Females	16	51.6
Total	31	100.0

The distribution of respondents' gender in table 3 shows that most respondents were female as much as 16 people (51.6%). A total of 15 people (48.4%) were male respondents.

This research Data is the result of measurements of the cardio-respiration endurance, BMI, fat percentage, and body age in the prospective hajj officers from the City of Yogyakarta. Research data were analyzed descriptively in order to facilitate the presentation. The results of the descriptive analysis on this research data are as follow.

Table 4. *Results of Descriptive Analysis*

Data	Min	Max	Mea	Medi	Mod	Std
Cardio-respiration endurance	8.21	15.80	12.27	12.33	8.21	1.85
BMI	19.80	33.11	24.83	25.11	19.80	3.17
Fat Percentage	15.10	36.50	27.31	27.90	28.20	5.30
Body age	28.00	55.00	41.51	43.00	47.00	8.55

1. Cardiorespiratory Endurance
2. The results of data analysis on the cardio-respiration endurance show that the lowest score was 8.21 and the highest score was 15.80. The results of the descriptive statistical analysis determine the average score (M) = 12.27; Median (Me) = 12.33; Mode (Mo) = 8.21, and standard deviation (SD) = 1.85.
3. BMI
4. The results of data analysis on BMI show that the lowest score was 19.80 and the highest score was 33.11. The results of the descriptive statistical analysis determine the average score (M) = 24.83; Median (Me) = 25.11; Mode (Mo) = 19.80, and standard deviation (SD) = 3.17.
5. Fat Percentage
6. The results of data analysis on fat percentage show that the lowest score was 15.10 and the highest score was 36.50. The results of the descriptive statistical analysis determine the average score (M) = 27.31; Median (Me) = 27.90; Mode (Mo) = 28.20, and standard deviation (SD) = 5.30.
7. Body Age
8. The results of data analysis on the body age show that the lowest score was 28.00 and the highest score was

55.00. The results of the descriptive statistical analysis determine the average score (M) = 41.51; Median (Me) = 43.00; Mode (Mo) = 47.00 and standard deviation (SD) = 8.55.

RESULTS OF DATA ANALYSIS

1. Data Categorisation

Data analysis was performed descriptively through categorizing the individual data of the cardiorespiration endurance, BMI, fat percentage, and body age of the prospective hajj officers from the City of Yogyakarta in accordance with the norm. The results of data categorisation are as follows.

a. Cardio-respiration endurance

The data of cardio-respiration endurance were categorized into 3 namely good, adequate, and less. The results of the analysis on cardio-respiration endurance data are as follows.

Table 5. Data Categories of Cardio-respiration Endurance

Cardio-respiration Endurance	Frequency	Percentage (%)
Good	4	12.9
Adequate	22	71.0
Less	5	16.1
Total	31	100.0

According to table 5, it is revealed that most respondents (71%) were at the category of adequate cardio-respiration endurance (22 respondents). A small part (12.9%) of respondents was at the good category (4 respondents).

b. BMI

The data of BMI were categorized into 4 namely skinny, normal, overweight, obesity level I, obesity level II and obesity level III. The results of analysis on BMI data are as follows.

Table 6. Data Categories of BMI

BMI	Frequency	Percentage (%)
Skinny	0	0,0
Normal	14	45,2
Overweight	15	48,4
Obesity Level I	2	6,5
Total	31	100,0

According to table 6, it is revealed that most respondents (48.4%) were at the overweight category of BMI (15 respondents). A small portion (6.5 %) of the respondents was in the category of obesity (2 people).

c. Fat Percentage

The data of fat percentage is categorized into 3 namely ideal, normal, and over. The results of the analysis on fat percentage data are as follows.

Table 7. Data Categories of Fat Percentage

Fat Percentage	Frequency	Percentage (%)
Ideal	5	16.1
Normal	19	61.3
Over	7	22.6
Total	31	100.0

According to table 7, it is determined that most respondents (61.3%) were at the normal category of fat percentage (19 people). A small percentage (16.1%) of respondents was at the ideal fat percentage (5 people).

d. Body Age

The data of body age were categorized into 3 namely younger than the actual age, same as the actual age, and older than the actual age. The results of analysis on body age data are as follows.

Table 8. Data Categories of Body Age

Body Age	Frequency	Percentage (%)
younger than the actual age	4	12.9
same as the actual age	5	16.1
older than the actual age	22	71.0
Total	31	100.0

DISCUSSION

The Ministry of Health of the Kingdom of Saudi Arabia in collaboration with the company Sanofi launched a health campaign entitled “Together for a Healthy Hajj”. This campaign aims to increase the awareness of hajj pilgrims about health requirements during the hajj season (Ridda Iman et al., 2019: 17). Some suggestions for maintaining personal hygiene and health in general are always conveyed by the Saudi Ministry of Health, such as: Guidelines for effective hand washing, following cough procedures, wearing face masks in crowded places, and maintaining personal hygiene (Memish Ziad A et al. al, 2013:331). Meanwhile, the Kingdom of Saudi Arabia also recommends that pilgrims get vaccinated against influenza, tetanus, mumps, and measles (Alqahtani, 2020).

It should be noted that the peak condition of a person’s cardiorespiratory endurance is around the age of 20-30 years and will decrease with age. This happens due to several factors, one of which is an unhealthy lifestyle, ignoring exercise on the grounds of being busy, this has an impact on heart muscle contraction (Auliadina, 2019). Apart from that, Alkhairi (2019) added that routinely doing exercises in preparation for Hajj, pilgrims and health workers must also pay attention to their rest schedule for muscle recovery, so they don’t tire easily.

A person’s understanding of other people, situations or other objects is the result of the learning process. According to According to S. A. Hoeger, W. W. K. & Hoeger (2018), physical exercise is a physical activity that requires planning, structure, and repetition to improve and maintain one’s fitness. Epidemiologists divide physical activity into two categories, namely structured physical activity (sports activity) and unstructured physical activity (daily activities). Understanding of physical training for Hajj health workers needs to be prepared through debriefing that is carried out from the start in an integrated manner between the Ministry of Health and the Ministry of Religion. Good physical exercise preparation needs to be done, because about 70% of hajj activities involve physical activity. In addition, we should know both Hajj pilgrims and health workers should focus on personal hygiene, measure the level of health and fitness, apply proper treatment for congenital diseases i.e., diabetes, allergies, cancer, etc and try to seek medical help if needed (Ibrahim, 2019).

Before undergoing debriefing, the Hajj health officers take a pretest about the knowledge of Hajj and its organizers. Then, after undergoing debriefing, a posttest is given which produces the lowest score of 60 and the highest score of 90.

During their work in Saudi Arabia, the officers will serve in three working areas, namely Makkah, Medina, and Jeddah and Medina airports. Officers working in the Medina and the airport serve about 74 working days. Meanwhile, the officers working in the area of Makkah will be in charge of about 62 working days (Muhammad Hafil, 2019:1). Based on interviews, most of healthcare officers on the City of Yogyakarta understand the materials about measurements of physical fitness, physical training, training principles, physical training models, and the physical training programme for Hajj preparations. According to Alamri (2018), from the findings of a study conducted, pilgrims have a short-term level of understanding. The suggestion is that Hajj officers should provide knowledge about health and preparation for Hajj in small groups with specific and important topics so that they are easy to understand and implement.

In the aspect of physical training loads, the understanding of the healthcare officers of the City of Yogyakarta is good. It is evidenced that the Hajj healthcare officers responds quickly to training frequency, training duration, and training types. For the training intensity, the Hajj healthcare officer is still in need to equalize the perception between the maximal heart rate and workout intensity from outside loads such as the Gym Machine. In the principles of physical training, the understanding of healthcare officers of the City of Yogyakarta can be demonstrated with the ability to explain well about the principles of *overload*, *progression*, *reversibility*, and the principle of *specificity*. In addition, circuit training is effective for improving physique fitness (Susanto et al, 2021: 100).

In the model of physical training, the understanding of Yogyakarta's healthcare officers is focused on brisk walk. Hajj healthcare officers think that by conducting regular brisk walk, physical fitness can be maintained so that it is beneficial in the service of pilgrims while in the Holy Land. According to Yudik Prasetyo et. Al. (2017:112) a combination treatment of aerobic – weight training conducted by providing brisk walk-weight training in the form of brisk walk with a distance of 1.6 km, repetition per training session 1-2 times, 2-3 minutes break between sessions, 18-20 minutes of duration, then resting for 5 minutes, continued with 8 repetitions of weight training, set 1-2, 2 minutes recovery between sets, and 8-10 posts can be used as an increase in physical fitness (cardio-respiration endurance, flexibility, muscle fitness, body composition) of prospective elderly pilgrims. The understanding of the Hajj healthcare officer is already good, but it needs to be improved in terms of physical training models, so that not only brisk walk, but also for the better performance of the Hajj healthcare officers to be combined between the brisk walk with weight training.

In the physical training program, the understanding of healthcare officers of the City of Yogyakarta can be demonstrated with the ability to explain training sessions, regular and systematic trainings, training programmes, training objectives, training aimed at one's ability, gender, and age. The healthcare officers of the City of Yogyakarta argue that physical trainings for the improvement of physical fitness for adolescent are different from one for the elderly. The Hajj healthcare officers need to understand elderly characteristics in guiding the elderly hajj pilgrims. In the studies of psychology and guidance and counseling, there is a psychosocial theory delivered by Erik H. Erikson. He describes the development of individual psychosocial ranging from children to elderly (Erikson, 1993). So that, health officers have to build Hajj pilgrims' motivation to do exercise for Hajj preparation both internal factors like the high willingness in doing healthy habits and external factors such as bringing professional coach, relationship, etc. (Prasetyo, 2020).

Over the years, Hajj has been the challenge of large public health that requires full attention from a number of sectors. The Ministry of Health has the fundamental mission during the Hajj season focusing on the best health care provision for pilgrims, continuous expansion of healthcare facilities, and the assignment of qualified healthcare personnel. Besides of that, Al-Hajri (2020) says that the confidence of all Hajj health workers in doing their duties can make the programs run well. Some factors that affect officers' quality such as the readiness in organizing services, focusing on technique of Hajj pilgrimage, having informative and communicative understanding, also can maximize managing times. Hajri (2020) also adds that having ability in making relationship, translating, and understanding in medical aspects also can make pilgrims more confident in doing Hajj. However, Hajj pilgrimage every year has different challenges for both officers and pilgrims. This explained by Mirza (2020), he says that every healthy system and services quality is based on some barometers include the confidence of workers in doing their jobs.

All sectors work in a multidisciplinary team approach to include prevention, curative, and promotion of the health needed by pilgrims in order to achieve the stated objectives (Abdel Hadi Hassn Eltahir, 2000: 14). To provide the best service, prospective healthcare officers should have a good performance. The performance of the prospective healthcare officers can be seen from the aspects of cardio-respiration, BMI, fat percentage, and body age.

Almuzaini, et. al. (2021) quotes the data from World Health Organization (WHO) where the climate change is one of five the most dangerous condition causing death. Temperature differences because of geographical location is a challenge for Hajj pilgrims. The Holy City Mecca as the location of Hajj pilgrimage is located in west side of Kingdom of Saudi Arabia (KSA), which characterize desert with extremely high temperature during the day. It is totally different with climate condition in Indonesia. Some indication of Heat Related Illness (HRI) such as fatigue, vomit, faint, hyperthermia, neurologic distraction, low blood pressure, and organs failure. Responding this case, Almuzaini adds that it's important to train Hajj health officers regularly, so they will be more maximal to give service Hajj pilgrims.

According to Mughal Faraz et. al. (2018: 1-2) in the year of 2017, The Saudi Arabian Ministry of Health stated that there were 643 deaths occurring during a Hajj season. From this death, 18% is associated with heart attack, 15% due to myocardial infarction, 3% sepsis, and 2% heatstroke. Pilgrims can come to health centres with various illnesses; Respiratory diseases accounted for 61% of the presentation, problem of musculoskeletal for 18%, dermatological for 15%, and gastrointestinal for 13%. According to Rahman Juma et al. (2017: 388), the cardiovascular disease was the leading cause of hospitalization and intensive care. Respiratory problems or infection is the most common disease happen during Hajj and Umrah. As stated by Dauda (2019) and explained by Utama (2019) that most of Hajj pilgrims got respiratory infection when they stay at Mecca and Madinah. This condition happen because of crowded, extreme climate, pollution, and infected by other pilgrims. Khan (2020) adds, besides of respiratory infection, there are some disease that commonly happen such as digestion problems, skin and eyes allergic, etc. Niu (2019) explains that viruses can spread quickly if there are 3 aspects, those are person/animal who carry the virus, medium to spread the viruses (in the air/water drop/touch) and person who are easily infected viruses.

Almalki reported in the hajj study that from 110 hospitalised patients from 20 different countries, there was 34% of them having ischemic heart disease, 20% having high blood pressure, and 17% having the prevalence of stroke. According to Madani, more than 60% of receptions of intensive care units in 7 hospitals in Mina and Arafat are due to cardiovascular. Among these cases, myocardial infarction and left-ventricular failure is the highest occurrence. Furthermore, cardiovascular events are the leading cause of death during the pilgrimage. In 2008, 66% (446) of deaths were caused by cardiovascular disease among Indonesian pilgrims. Based on the data, the implementation of Hajj can be run properly if the function of cardiorespiratory endurance as the indicator of one's fitness to be observed and prepared in advance.

Cardiorespiratory endurance is one of the most important components of physical fitness (Getchell, 1979:13). The higher the oxygen intake, the more a person's life reserves. This shows that cardiorespiratory endurance is a representative indicator to describe physical fitness status. Based on research data, most of the respondents (71%) are in the adequate category on their cardiorespiratory endurance. A small proportion of respondents (12.9%) are in the good category of cardiorespiratory endurance (4 respondents). This shows that prospective hajj health workers still need to improve their cardiorespiratory endurance by conducting systematic, regular, and measurable training. Exercises are performed by involving the large muscles of the body, performed 3-5 times per week, continuously, starting with warm-up, core activity, and cool-down.

Meanwhile, Rustika (2020) says that the health of Indonesian Hajj pilgrims is a complicated case because based on audit management result in Hajj 2012-2014 ago, there are many Hajj pilgrims are not implement *isthitaah* during Hajj pilgrimage. *Isthitaah* is a term that combines three requirements of Hajj pilgrimage, those are faith ability, financial ability, and physical ability. Those three aspects is important because it will make Hajj pilgrims feel more confident and safe.

The healthier participants, the more participants prepared for mass meetings, the more likely it will be to succeed. To ensure success, efforts must be made to be able to know the risks and actions taken before attending the pilgrimage. It includes vaccination campaigns, information about environmental conditions, and fitness or stamina levels required to participate in the pilgrimage securely (Ridda Iman et al., 2019: 6).

Abe et al. (1997) convey that aerobic exercise with the frequency of 3-5 times per week as recommended by ACSM can decrease subcutaneous fat mass and visceral fat. Hodder & Stoughton (1997) convey that aerobic gymnastics can lower the body fat percentage, as well as adding muscle myofibril, solid bone structure, and connective tissues. Fitness is influenced by nutritional status (body fat composition). VO_2 max largely depends on body mass and lean body mass, whereas excessive fat mass imposes an unfavorable burden on cardiac function and oxygen intake by working muscles. It is suggested that the reduction of oxygen uses by adipose tissues during exercise reduces the

overall $VO_2\max$ (Chatterjee et al., 2004). Auliadina (2019) adds that $VO_2\max$ also affected by gender. The differences of $VO_2\max$ between male and female is related to the differences of body size and composition. Physiologically male body is different with female body, which female body has more body fat than muscle if compared with male's body. That is why female has low $VO_2\max$ level. Besides of that, the differences in hemoglobin concentration level also affecting body ability to get high $VO_2\max$ level. Female hemoglobin degree is higher than male, this fact shows that oxygen tied by hemoglobin cannot be distribute well.

Body composition is a comparison of body weight with fat to weight without fat. Body fat is stored in adipose tissues that resides between the skin and the muscles, especially on the abdomen, pelvis, arms, and back (Djoko PI, 2000:56). Evaluation on body composition is one of the essential components for Body Fitness assessments. Based on the research data, most respondents (61.3%) were at the normal category of body fat percentage (19 people). The small portion of the respondent (16.1%) was at the ideal category of body fat. This indicates that the prospective healthcare officers of Hajj still need to keep his body fat percentage to be ideal in order to be able to perform mobility services to the Pilgrims well. Someone's nutritional status can be measured by Body Mass Index, belly circumference, and body fat percentage. Body Mass Index (BMI) can be measured by counting body height (meters) per body weight (kilograms). The lower Body Mass Index, the higher maximum oxygen capacity. On the other hand, the higher Body Mass Index, the lower maximum oxygen capacity (Auliadina, 2019).

Excessive Body Mass Index can be caused by over consumption or due to lack of activity. Fat deposits in the body can cause narrowing of the blood vessels so that the cardiorespiratory system works extra to be able to supply the need of oxygen of the cells and the entire body tissues (Saudail Ghomim, 2017: 84). Based on obtained data, most of the respondents (48.4%) were at the category of overweight (15 people). A small portion of the respondents (6.5%) was in the category of obesity (2 people). Auliadina (2019) explains, it is important to measure belly circumference which is can determine the height of fat degree inside the stomach generally. Belly circumference can be measured by girth measuring tape on the belly. From the explanation above, it indicates that the healthcare officers of Hajj need to control the body weight along with healthy and nutritious meal menus, as well as doing aerobics such as: brisk walk, jogging, biking, and aerobic gymnastics. Prospective healthcare officers of Hajj who do not want to make adjustment between energy input and energy output will result in overweight. Doing exercise can improve personal health both dynamic and static. Dynamic health is the ability to perform physical activity in a good way (Prasetyo, 2020).

Metabolic age is a numerical calculation that shows the age of the body in terms of the type of metabolism. If the body age is higher than the birth age, it indicates overweight or obesity. If the metabolic age is lower than the birth age, it indicates that the body is in good condition, healthy, getting lower, and getting healthier. Based on the data, there are 71% of respondents who are categorized as older than their actual age. This shows that prospective health workers have experienced a decrease in the type of metabolism. Under these circumstances, prospective hajj health workers should make better preventive efforts so that the body is always healthy and fit in order to provide excellent service to pilgrims.

CONCLUSION AND SUGGESTIONS

Prospective medical officers in carrying out their duties need to have a good understanding of physical training and performance, because the pilgrims served are a lot and having different characteristics (age, gender, education levels). Cardio-respiration endurance has a relationship with body fat. The higher endurance of cardio-respiration, the lower the body fat is. In addition, the body age that becomes an indicator of cell mass age is also significant to the Hajj healthcare officers. The understanding of physical training and performance of prospective Hajj healthcare officers must be prepared and increased gradually, because the Hajj healthcare officer does not only work while at Makkah and Medina, but also during the health and fitness coaching preparation for their own selves as officers and fitness coaching for prospective pilgrims. It is important to improve the quality of Hajj services in the future.

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Conflict of Interest

The authors declare that there are no conflicts of interest.

REFERENCES

- Abdel Hadi Hassn Eltahir. (2000). Development Of Health Services In Hajj Seasons. PMC US National Library of Medicine National Institutes of Health: *Journal of Family & Community Medicine*, 7(1), 13.
- Abd-Ellatif, E. E., Alhomidan, L., Al-Assaf, L., AlGhamdi, L., Alharbi, A., Albeladi, O., ... & Almudarra, S. S. (2021). Assessment of Knowledge, attitudes and practices concerning travel health among Hajj pilgrims (1439 H-2018 G) at Prince Mohammad bin Abdulaziz International Airport in AL-Madina, Saudi Arabia. Research Square.
- Choliq, A. (2018). Esensi Program Bimbel Manasik Haji Upaya Pemberdayaan Masyarakat. *Jurnal At-Taqaddum*, 10(1), 23-49.
- Abdullah Al Shimemeri. (2012). Cardiovascular disease in Hajj pilgrims. PMC US National Library of Medicine National Institutes of Health: *Journal of The Saudi Heart Association*.
- Abe, T., Kawakami, Y., Sugita, M. & Fukunaga, T. (1997). Relationship between training frequency and subcutaneous and visceral fat in women. *Med. Sci. Sports Exerc.* 29: 1549 – 53.
- Alamri, F. A., Amer, S. A., & Alhraiwil, N. J. (2018). Knowledge and Practice after Health Education Program among Hajj 1438 H (2017) Pilgrims. Saudi Arabia. *Journal of Epidemiology & Health Care*, 1(1), 7.
- Alanzi, M. E., Albalawi, M. A. H., Kabrah, S., Aljehani, Y. T., Okashah, A. M., Aljohani, Z. D. E., ... & El Sayed, S. (2019). *Knowledge, Attitudes, and Practices (KAPs) of healthcare workers towards MERS-CoV infection at PHCs in Madinah, KSA during Hajj 1440, 2019.* *Am J Microbiol Res*, 7(4), 122-9.
- Al-Hajri, S. T. S., Alkaseer, K., Al-Shehri, A., Al-Harbi, H. M. A., bin Taleb, H. S. A., Al-Shehri, A. J., ... & El Sayed, S. M. (2020). Factors Influencing Healthcare Professionals' Performance during Hajj Season of 2019 in Al-Madinah. *American Journal of Clinical Medicine Research*, 8(2), 37-42.
- Alkhairi, H. A., Almatrafi, A. A., Alsulami, A. A., Alsafrani, M. A., Albogami, F. S., Almuqati, M. M., & Almatrafi, K. A. (2019). Impact of heavy physical activity and musculoskeletal pain during Umrah on the health of the Algerian population. *International Journal of Medicine in Developing Country*.
- Almuzaini, Y., Abdulmalek, N., Ghallab, S., Mushi, A., Yassin, Y., Yezli, S., & Khan, A. A. (2021). Adherence of Healthcare Workers to Saudi Management Guidelines of Heat-Related Illnesses during Hajj Pilgrimage. *International journal of environmental research and public health*, 18(3), 1156.
- Alqahtani, A. S., Tashani, M., Heywood, A. E., Almohammed, A. B. S., Booy, R., Wiley, K. E., & Rashid, H. (2020). Tracking Australian Hajj Pilgrims' Health Behavior before, during and after Hajj, and the Effective Use of Preventive Measures in Reducing Hajj-Related Illness: A Cohort Study. *Pharmacy*, 8(2), 78.
- Alqahtani, A. S., Tashani, M., Heywood, A. E., Booy, R., Rashid, H., & Wiley, K. E. (2019). Exploring Australian Hajj tour operators' knowledge and practices regarding pilgrims' health risks: A qualitative study. *JMIR public health and surveillance*, 5(2), e10960.
- Auliadina, D., Amilia, F. R., Nuarti, N., & Jayanti, R. (2019, November). Abdominal Circumference, Body Fat Percent, and VO2 Max in Pilgrims of Hulu Sungai Tengah Regency. In *Journal of Physics: Conference Series* (Vol. 1374, No. 1, p. 012058). IOP Publishing.
- Azhar, A. N., Ridzuan, A. R., Bakar, M. H., Sultan Mohideen, R., Ilyas, I. Y., & Suyurno, S. S. (2020). Factor that affects the eagerness to perform pilgrimage of Umrah and Hajj. *e-Journal of Media and Society (e-JOMS)*, 5.
- Bokhary, H., Barasheed, O., Ghany, M. A. E., Khatami, A., Hill-Cawthorne, G. A., & Rasheed, H. (2020). Pilot survey of knowledge, attitudes and perceptions of Hajj deployed health care workers on antibiotics and antibiotic prescriptions for upper respiratory tract infections: Results from two Hajj seasons. *Tropical medicine and infectious disease*, 5(1), 18.
- Chatterjee, S., Chatterjee, P., & Bandhopadhyay, A. (2005). Cardiorespiratory fitness of obese boys. *Indian journal of physiology and pharmacology*, 49(3), 353.
- Data Umat Islam: <https://data.kemenag.go.id/agamadashboard/statistik/umat>
- Dauda Goni, M., Hasan, H., Naing, N. N., Wan-Arfah, N., Zeiny Deris, Z., Nor Arifin, W., & Abubakar Baaba, A. (2019). Assessment of knowledge, attitude and practice towards prevention of respiratory tract infections among Hajj and Umrah Pilgrims from Malaysia in 2018. *International journal of environmental research and public health*, 16(22), 4569.
- Djoko. P. I. (2000). *Panduan Latihan Kebugaran (Yang Efektif dan Aman)*. Yogyakarta: Lukman Offset.
- DA. Abdelmoety et al. (2018). Characteristics of Heat Illness during Hajj: A Cross-Sectional Study. *BioMed Research International*, Volume 2018, Article ID 5629474, 6 pages.
- Ebrahim, S. H., Doumbia, S., Elachola, H., & Memish, Z. A. (2019). "Healthy Hajj 2019"—what you need to know, before you go. *Travel medicine and infectious disease*, 30, 1.
- Educe, S. A. A. H., Nizar, T. J., & Yusof, F. M. (2014). Tahap Kefahaman Jemaah Haji Malaysia Terhadap Pelaksanaan Ibadat Haji: Satu Penilaian Kuantitatif. *Jurnal Teknologi*, 68(1).
- Erikson, E. H. (1993). *Childhood and Society*. New York: W.W. Norton & Company.
- Fiqhislam.com. (2020). *Alasan Arab Saudi Belum Bisa Tambah Kuota Haji Indonesia*. Pustaka Muslim.
- Gatrad, A. R., & Sheikh, A. (2005). Hajj: journey of a lifetime. *Bmj*, 330(7483), 133-137.
- Hodder & Stonghton. (1997). *Sport Therapy : An Introduction to Theory and Practice*. Scotprint Ltd., Musselburg.
- <https://www.tokopedia.com/sierraromeo0748/omron-hbf-375-karada-scan-body-composition-monitor>. *Omron Hbf-375 Karada Scan Body Composition Monitor*.
- Ibrahim, M., Abdelaziz, S. I., Almagd, M. A., Alarouj, M., Annabi, F. A., Armstrong, D. G., ... & Umpierrez, G. E. (2018). Recommendations for management of diabetes and its complications during Hajj (Muslim pilgrimage). *BMJ Open Diabetes Research and Care*, 6(1).
- Jayanti, R., Huldani, H., & Asnawati, A. (2019). Hubungan Porsen Lemak Tubuh dengan Kapasitas Oksigen Maksimal pada Calon Jemaah Haji. *Homeostasis*, 2(1), 87-92.
- Khan, A., Bieh, K. L., El-Ganainy, A., Ghallab, S., Assiri, A., & Jokhdar, H. (2020). Estimating the COVID-19 risk during the Hajj pilgrimage. *Journal of Travel Medicine*, 27(8), taaa157.
- Khan, M. I. H., Ahmad, K. A., Shakeel, S., & Qasim, M. (2020). Health knowledge and attitude practices in Pakistani Hajj Pilgrims. *The Professional Medical Journal*, 27(02), 359-364.

- Kusuma Wardhani, M. R., Supriyanto, S., Skripsa, T. H., & Rakhmawaty, W. (2019). Analysis of Quality Assurance on Health Development of Hajj Pilgrims in Bojonegoro District. *Indian Journal of Public Health Research & Development*, 10(8).
- Linda S. Pescatello; associate editors, Ross Arena, Deborah Riebe, Paul D. Thompson. (2014). ACSM's Guidelines for Exercise Testing and Prescription Ninth Edition. Philadelphia: *Wolters Kluwer/Lippincott Williams & Wilkins Health*. Hal 64. Diakses: <http://www.scribd.com/doc/218472842/ACSM-s-Guidelines-for-Exercise-Testing-and-Prescription-9th-edition-pdf#>.
- Mahdi, H., Alqahtani, A., Barasheed, O., Alemam, A., Alhakami, M., Gadah, I., ... & Rashid, H. (2020). Hand Hygiene Knowledge and Practices among Domestic Hajj Pilgrims: Implications for Future Mass Gatherings Amidst COVID-19. *Tropical Medicine and Infectious Disease*, 5(4), 160.
- Mansyur, M. (2020). Hajj health istithaah amid the COVID-19 pandemic. *Medical Journal of Indonesia*, 29(2), 115-7.
- Memish Ziad A et al. (2013). Hajj: preparations underway. Copyright © Memish et al. Open Access article distributed under the terms of CC BY-NC-ND. [http://dx.doi.org/10.1016/S2214-109X\(13\)70079-2](http://dx.doi.org/10.1016/S2214-109X(13)70079-2).
- Merrit College. (2019). *Bloom's Taxonomy*. <https://www.merritt.edu/wp/slo/for-faculty/blooms-taxonomy/>.
- Mirza, A. A., Badrek-Amoudi, A. H., Farooq, M. U., Senan, H. A., Aun, R. H., Mirza, A. A., ... & Halawani10, M. A. (2020). Job satisfaction amongst surgical healthcare professionals during Hajj and Non-Hajj periods: An analytical multi-center cross-sectional study in the holy city of Makkah, Saudi Arabia. *JPMA*, 2020.
- Mughal, F., Chew-Graham, C. A., & Saad, A. (2018). Hajj: what it means for general practice. *BJGP open*, 2(2).
- Muhammad Hafil. (2019). *Pemahaman Petugas Haji 2019 Meningkatkan*. ihram.co.id.
- Nieman David C. (1993). *Fitness and Your Health*. California: Bull Publishing Company.
- Ningsih Ika Setia, Junaidi. (2005). Pengaruh Latihan Senam Haji Terhadap Peningkatan Daya Tahan Jantung Paru Pada Calon Jemaah Haji Non Resiko Tinggi. *Jurnal Fisioterapi Indonusa*, 5(2), 45-9.
- Niu, S., & Xu, M. (2019). Impact of Hajj on Global Health Security. *Journal of religion and health*, 58(1), 289-302.
- Nurhasan dan Hasanudin Cholil. (2007). *Tes dan Pengukuran Olahraga*. Bandung: FPOK-UPI.
- Prasetyo, Y., SISWANTOYO, S., & MUHAMMAD, Z. (2020). Physical Fitness Modelling and Sports Motivation for Prospective Pilgrims in Yogyakarta, Indonesia. *Utopia y Praxis Latinoamericana*, 25(10), 31-46.
- Pusat Bahasa Departemen Pendidikan Nasional. (2008). *Kamus Bahasa Indonesia*. Jakarta.
- Putra, A. P., Arsyad, A., Huldani, H., Achmad, H., Sukmana, B. I., Adiputro, D. L., & Kasab, J. (2020). Differences in VO2 Max Based on Age, Gender, Hemoglobin Levels, and Leukocyte Counts in Hajj Prospective Pilgrims in Hulu Sungai Tengah Regency, South Kalimantan. Department of physiology, Medical Faculty, Lambung Mangkurat University, Banjarmasin, Indonesia
- Rahman, J., Thu, M., Arshad, N., & Van der Putten, M. (2017). Mass gatherings and public health: case studies from the Hajj to Mecca. *Annals of global health*, 83(2), 386-393. <http://dx.doi.org/10.1016/j.aogh.2016.12.001>.
- Rashid, A. A. (2018). Hajj And Its Spiritual Education In The Development Of Akhlaq: Ideal And Challenges. *Asian journal of management sciences & education*, 7(2), 152-156.
- Ridda, I., Mansoor, S., Briggs, R., Gishe, J., & Aatmn, D. (2021). Preparedness for mass gathering during Hajj and Umrah. *Handbook of health-care in the Arab World*, 1215-1235. https://doi.org/10.1007/978-3-319-74365-3_48-1
- Rustika, R., Oemiati, R., Asyary, A., & Rachmawati, T. (2020). An evaluation of health policy implementation for Hajj pilgrims in Indonesia. *Journal of Epidemiology and Global Health*, 10(4), 263.
- S. A. Hoeger, W. W. K. & Hoeger.(2018). *Fitness and Wellness*, 9th ed. United State of America: Weadswort Cengage Learning.
- Shafi, S., Dar, O., Khan, M., Khan, M., Azhar, E. I., McCloskey, B., ... & Petersen, E. (2016). The annual Hajj pilgrimage—minimizing the risk of ill health in pilgrims from Europe and opportunity for driving the best prevention and health promotion guidelines. *International journal of infectious diseases*, 47, 79-82.
- Vanavanan, S., Srisawasdi, P., Rochanawutanon, M., Kumproa, N., Kruthkul, K., & Kroll, M. H. (2018). Performance of body mass index and percentage of body fat in predicting cardiometabolic risk factors in Thai adults. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy*, 11, 241.
- Susanto, S., Siswantoyo, S., Prasetyo, Y., & Putranta, H. (2021). The effect of circuit training on physical fitness and archery accuracy in novice athletes. *Physical Activity Review*, 1(9), 100-108.
- Thirafi, F. Z., & Hakim, S. N. (2018, February). Elderly Anxiety in the Process of Regular Hajj. In *3rd ASEAN Conference on Psychology, Counselling, and Humanities (ACPCH 2017)* (pp. 227-229). Atlantis Press.
- Utama, D. N., Faturrahman, M., Rusdi, M., Saputra, I. Y., Isnaeni, F. S., & Waspodo, B. (2019, March). FHC-optimization model for deciding the objective Hajj pilgrims to restricted quota (Case Study: Hajj Pilgrimage Procedure in Indonesia). In *2019 International Conference of Artificial Intelligence and Information Technology (ICAIIIT)* (pp. 302-309). IEEE.
- International Conference of Artificial Intelligence and Information Technology (ICAIIIT) (pp. 302-309). IEEE.
- Utami, E., & Ardiana, M. (2021). 15. BODY MASS INDEX AND HYPERTENSION IN INDONESIAN HAJJ PILGRIMS. *Journal of Hypertension*, 39, e4.
- Prasetyo, Y., Doewes, M., Rahma, N., & Anantanyu, S. (2017). Effects of aerobic exercise and weight training-aerobic towards physical fitness of elderly Hajj candidates. *International Journal on Advanced Science, Engineering and Information Technology*, 7(1), 106-117.
- Yusri, Y., Zulkarnain, M., & Sitorus, R. J. (2020). Faktor Faktor yang Mempengaruhi Kebugaran Calon Jemaah Haji Kota Palembang Tahun 2019. *Jurnal Epidemiologi Kesehatan Komunitas*, 5(1), 57-68.

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