

Correlation of physical activity and other factors to fruit and vegetable intake among civilian pilots in Indonesia

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Abstrak

Latar belakang: ICAO (International civil aviation organization) menyatakan pentingnya menjaga kesehatan penerbang sehingga tidak terjadi inkapasitasi. Salah satu upayanya adalah pola diet sehat dengan konsumsi buah dan sayur. Tujuan studi adalah untuk mengetahui hubungan aktivitas fisik dan faktor lain terhadap pola konsumsi buah dan sayur.

Metode: Studi potong lintang dengan sampel total dari data sekunder penerbang yang melakukan pemeriksaan kesehatan berkala di Balai Kesehatan Penerbangan Jakarta bulan April 2016. Data berupa data demografi, pekerjaan, konsumsi buah dan sayur, aktivitas fisik, pengetahuan konsumsi buah dan sayur, dan dukungan sosial. Analisis dengan regresi Logistik.

Hasil: Penerbang yang mengikuti penelitian ini berjumlah 530 orang. Aktivitas fisik tidak berhubungan dengan konsumsi buah dan sayur. Tidak adanya pengetahuan konsumsi buah dan sayur berisiko jarang konsumsi buah dan sayur sebanyak 3,9 kali [ORa = 3,93; 95% CI=1,74-8,87; p=0,001], ini sesuai dengan teori social cognitive yang menyatakan pengetahuan konsumsi buah dan sayur merupakan faktor personal.

Kesimpulan: Adanya hubungan antara pengetahuan konsumsi buah dan sayur terhadap kebiasaan konsumsi buah dan sayur yang sehat (≥ 5 kali/hari) di antara penerbang di Indonesia. (*Health Science Journal of Indonesia 2016;7(2):118-122*)

Kata kunci : buah dan sayur, penerbang sipil, Indonesia.

Abstract

Background: International civil aviation organization stated the importance of maintaining pilot's health to avoid incapacitation. One of the efforts for this is consuming healthy diet with fruits and vegetables. The purpose of this study is to identify the correlation of physical activity and other factors related to fruits and vegetables intake.

Methods: A cross-sectional study conducted with a total sampling, using secondary data of the pilot that conducted periodical medical examinations in the Civil Aviation Medical Center, Jakarta on April 2016. Data collected were demographic and job characteristics, fruit and vegetable consumption, physical activity, knowledge about fruit and vegetable intake, and social support.

Results: The pilots participate in this study were 530 individuals. No correlation between physical activity and fruits and vegetables intake. The dominant factor associated with fruits and vegetables intake is the knowledge about fruits and vegetables intake. Pilots with poor knowledge decrease consumption 3,9 times lower [ORa = 3.93; 95% CI = 1.74 to 8.87; p = 0.001]. In this study, knowledge about fruit and vegetable intake as a personal factors according to social cognitive theory.

Conclusion: The knowledge about fruits and vegetables intake according to WHO recommendations increased the frequency of fruits and vegetables intake. (*Health Science Journal of Indonesia 2016;7(2):118-122*)

Keywords: fruits and vegetables, a civilian pilot, Indonesia

Since 2010, the ICAO (International of civil aviation organization) states the basic principles of safety management is a part of the safety program with the concept of the importance of maintaining the health of pilots to minimize the risk of incapacitation factor. Cardiovascular disease can be a risk incapacitation factor.¹ The study mentioned by Inne, civilian pilots in Indonesia suffering from metabolic syndrome as much as 18.3%² so they need an effort to decrease risk factors of disease as recommended by ICAO, with a healthy lifestyle such as consumption of fruit and vegetable.³ World Health Organization (WHO) recommends consumption of fruits and vegetables as much as ≥ 5 serving / day as one of the indicators of healthy eating habits.⁴

Consumption of fruits and vegetables as a healthy eating habit is influenced by some factors based on social cognitive theory such as personal factors and environmental factors. On personal factor seen from demographic factors such as age and employment, a factor of knowledge and healthy behaviors such as physical activity undertaken aviator as a factor that may be associated with the consumption of fruits and vegetables. On the physical environmental factors can be judged from the availability of fruits and vegetables in the work environment and family support as factors that may be associated with the consumption of fruit and vegetable.^{5,6}

Fruit and vegetable consumption habit in the aviation world is important for health, so in this study it will be examined for the factors associated with the consumption of fruits and vegetables on a civilian pilots in Indonesia.

METHODS

This study used cross-sectional study design. Subjects were civilian pilots in Indonesia. The data collection was from the secondary data on periodic medical examinations in April 2016 at Aviation Medical Center (*Balai Kesehatan Penerbangan*), Jakarta. Every data that support the theory of social cognitive such as demographic data, physical activity, the knowledge about fruit and vegetable consumption as recommended by the WHO, and the availability of fruit and vegetables in work environment and family support will be collected.

The main risk factor in this study was physical activity. Physical activity include appropriate physical activity and inappropriate physical activity. Pilot's physical activity judged on physical activity score calculation in METs-

min/week. Appropriate physical activity is based on the World Health Organization (WHO) recommendations, namely the data quantity and quality of physical activity by doing 150 minutes of activity of moderate intensity throughout the week, or 75 minutes of activity high intensity throughout the week, or a combination of moderate intensity and high intensity.⁷

The age divided into two categories: age ≤ 44 years and ≥ 45 years. Job risk factors obtained from type of aircraft which are fixed-wing and rotary-wing. Knowledge about fruit and vegetable consumption for health obtained from the questionnaire. The availability of fruit and vegetables in the workplace is also asked in the questionnaires. The risk factors of family support obtained from questionnaires of their family support for fruit and vegetable consumption since adolescence. This research analyzes using logistic regression. Data were processed using STATA version 9. Ethical approval was obtained from Health Research Ethics Committee of the Faculty of Medicine, University of Indonesia. This study was conducted after obtaining the approval from the Chief of the Aviation Medical Centre.

RESULTS

The pilots participate in this study were 530 individuals. In Table 1 presented the relationship between demographic characteristics, job, knowledge about fruit and vegetable consumption as recommended by the WHO, the availability of fruits and vegetables in the workplace, physical activity, and family support. The subject who doesn't know fruit and vegetable consumption as recommended by the WHO seems decreased as much as 3.52 times, lower than who knows fruit and vegetable consumption. In table 1 show that subjects without their fruits and vegetables in the workplace seems likely to have decreased by 2.11 times to consume fruit and vegetables as recommended by WHO compared to subjects who get access to fruits and vegetables in the workplace. A subject who doesn't perform appropriate physical activity appears likely to have decreased by 1.56 times to be able to consume fruits and vegetables according to WHO recommendations. Meanwhile, subjects who consumed fruits and vegetables seem to be uniformly distributed in terms of age range, type of rotary-wing aircraft. Family support can not be calculated because of the existence of one of the cells which are not subject.

In Table 2 shows that the physical activity's subject was not proven being an affecting factor of fruit and vegetable intake. The dominant factor associated with the consumption of fruits and vegetables is the knowledge about the consumption of fruits and vegetables as recommended by t WHO. Airmen who doesn't know the consumption of fruit and vegetables as recommended by WHO compared with pilots who knows the consumption of fruits and vegetables as

recommended by the WHO were less likely frequent consumption of fruits and vegetables as much as 3.9 times [ORa = 3.93; 95% CI = 1.74 to 8.87; p = 0.001]. On the subject that did not get fruit and vegetables in the workplace is no different fruits and vegetables with a subject that gets fruit and vegetables in the workplace. On cognitive theory, this research can be seen that the personal factor is a factor related to the consumption of fruits and vegetables as recommended by WHO.

Table 1. The relationship between demographic characteristics, job, knowledge about fruit and vegetable consumption as recommended by the WHO, the availability of fruits and vegetables in the workplace, physical activity, and family support

	Fruits and vegetables intake				Crude odds ratio	95% confidence interval	p
	Infrequent (n= 502)		Frequent (n=28)				
	n	%	n	%			
Age							
45-65 year	417	83,07	22	78,57	1,33	0,53-3,39	0,540
18- 44 year	85	16,93	6	21,43	1,00	Reference	
Type of aircraft							
Rotary-wing	45	8,96	3	10,71	0,82	0,24-2,82	0,754
Fixed-wing	457	91,04	25	89,29	1,00	Reference	
Knows about fruit and vegetable consumption as recommended by the WHO							
No	424	84,46	17	60,71	3,52	1,58-7,79	0,002
Yes	78	15,54	11	39,29	1,00	Reference	
The availability of fruits and vegetables in the workplace							
No	422	84,06	20	71,43	2,11	0,89-4,95	0,087
Yes	80	15,94	8	28,57	1,00	Reference	
Physical Activity							
Inappropriate	271	53,98	12	42,85	1,56	0,72-3,37	0,254
Appropriate	231	46,02	16	57,14	1,00	Reference	
Family support							
No	34	6,77	0	0	0	n/a*	
Yes	468	93,23	28	100	1,00		

* n/a: not applicable

Table 2. Factors of the knowledge about fruit and vegetable consumption as recommended by the WHO, the availability of fruits and vegetables in the workplace, as well as the physical activity of the consumption of fruit and vegetables

	Fruits and vegetables intake				Adjusted odds ratio*	95% confidence interval	p
	Infrequent (n= 502)		Frequent (n=28)				
	n	%	n	%			
Knows about fruit and vegetable consumption as recommended by the WHO							
No	424	84,46	17	60,71	3,93	1,74-8,87	0,001
Yes	78	15,54	11	39,29	1,00	Reference	
The availability of fruits and vegetables in the workplace							
No	422	84,06	20	71,43	2,34	0,97-5,64	0,057
Yes	80	15,94	8	28,57	1,00	Reference	
Physical activity							
Inappropriate	271	53,98	12	42,85	1,68	0,76-3,69	0,195
Aproprate	231	46,01	16	57,14	1,00	Reference	

*Adjusted each other between the variables in this table

DISCUSSION

Limitations in this study are the use of secondary data that already exist. The final model, it appears that physical activity was not associated with the consumption of fruits and vegetables. This is due to the number of subjects in the presence of other risk factors are more dominant towards increased consumption of fruits and vegetables as recommended by the WHO as well as affect the outcome becomes. Knowledge of individuals within the social cognitive theory can influence and change behavior.⁸ Knowledge about the health benefits creates preconditions behavior change. In this research has not been able to prove the relationship of environmental factors on fruit and vegetable consumption as described in social cognitive theory.

Healty food is one of the important factor in maintain health.⁹ Ideally pilots get nutrient-rich foods. In the reality, foods high in fat, high-sugar, high-salt and widely available, especially at airports. For pilots who worked at major airlines, the food service on the plane can be provided with reasonable quality. Aircrew also provided facilities with a wide variety of food menus. Their flight with a layover on little airports, they have losses a chance to eat quality foods because it is not provided, and even pilots do not have enough free time and immediately have to transport passengers.¹⁰

Pilots should be able to operate various systems in the aircraft during flight, especially engine controls, navigation, fuel control, communications, control of the fuselage, and also environmental controls.⁶ Interventions to increase fruit and vegetable aims to build support structures that will sustain long-term efforts in maintaining the health of pilot.¹¹ Berg in 2011 concluded that the knowledge the benefit of fruits and vegetables were associated with the consumption of fruits and vegetables more 5 serving per day.¹² Knowledge about the benefit for consumption fruit and vegetable can also chance their habit in diet.^{13,14} Intervention can be face to face counseling or computer-based information and print as one way to improve knowledge about fruit and vegetable consumption in accordance WHO.¹¹ In Indonesia, in line with the regulations of the Minister of Transport of the Republic of Indonesia No. 8 2015 on health standards and certification of flight personnel¹⁵, it will be needed aviation medicine doctors on each airline to provide education about the importance of healthy foods, especially fruits and vegetables so that health can be maintained.

In conclusion, knowledge of fruit and vegetable consumption according to WHO recommendations related to the frequency of consumption of fruits and vegetables (≥ 5 servings / day).

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REFERENCES

1. International Civil Aviation Organization. Manual of Civil Aviation Medicine. 2012.
2. Yuliawati I, Siagian M, Abudi T, et al. The effect of workload and other risk factors of metabolic syndrome among short-haul commercial penerbangs in Indonesia. 2015;6(2):81–6.
3. Agudo A, Joint F. Measuring intake of fruit and vegetables [Internet]. World Health Organization. Spain; 2005. 3-4 p. Available from: <https://extranet.who.int/iris/restricted/handle/10665/43144>
4. Dehghan M, Akhtar-Danesh N, Merchant AT. Factors associated with fruit and vegetable consumption among adults. *J Hum Nutr Diet*. 2011;24(2):128–34.
5. Penney TL. Understanding healthy eating behaviour within the context of the modern food environment. 2013;(August).
6. Melorose J, Perroy R, Careas S. Understanding healthy eating behaviour within the context of the modern food environment. Vol. 1, *Statewide Agricultural Land Use Baseline 2015*. 2015.
7. WHO. *Physical-Activity-Recommendations-18-64 Years*. 2011;2011.
8. Roberts K, Marvin K. Knowledge and attitudes towards healthy eating and physical activity : what the data tell us. *National Obesity Observatory*. 2011:1-39 p.
9. Reinhart RO. Health maintenance program. In: *Basic flight Physiology*. 3rd ed. USA: McGraw Hill; 2008. p. 266–72.
10. Mohler MH, Mohler SR. Eating Habits During Layover Affect Flight Performance. 1991;38(6).
11. EUFIC. Fruit and vegetable consumption in Europe – Do Europeans get enough? [Internet]. *European Food Information Council Review*. 2012. 1-7 p. Available from: <http://www.eufic.org/article/en/page/RARCHIVE/expid/Fruit-vegetable-consumption-Europe/>
12. Carla J. Berg, Christine Makosky Daley, Niaman Nazir, JB, et al. Physical activity and fruit and vegetable intake among American Indians. *J Community Heal*. 2011;4(164):65–71.
13. Othman KI, Shahrin M, Karim A, et al. Factors Influencing Fruits and Vegetables Consumption Behaviour Among Adults in Malaysia. *J Agribus*. 2012;5:29–46.

14. Guillaumie L, Godin G, Vézina-Im L-A. Psychosocial determinants of fruit and vegetable intake in adult population: a systematic review. *Int J Behav Nutr Phys Act.* 2010;7:12.
15. Direktur Jenderal Perhubungan Udara. Peraturan Nomor : KP 572 tahun 2015. Tentang petunjuk pelaksanaan peraturan menteri perhubungan nomor PM 8 tahun 2015 tentang peraturan keselamatan penerbangan sipil bagian 67(Civil Aviation Safety Regulation part 67) tentang standar kesehatan dan sertifikasi personel penerbangan.2015. Indonesian