The difference of physical activity and gender: a secondary data analysis of non-communicable disease among farmers in public health center of Jember Regency, Indonesia

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Abstract

Background: Lack of physical activity can increase the risk of Non-Communicable Diseases (NCDs) among farmers regarding their activities while working.
Objectice: This study was to analyze differences physical activity among farmers regarding their gender in Integrated of NCDs Post of Pakusari Health Center, Jember.
Method: A survey with a retrospective cohort study design based on secondary data analysis of Integrated of NCDs Post from January to October 2020 was performed among 112 farmers. The characteristics of participants and physical activity were measured through Healthy Registered Card of Integrated of NCDs Post. Chi square test was used to answer the research objectives (p value < 0.05).
Results: The results showed that there were differenced physical activity between male and female farmers ($\chi 2$=9.172; p-value=0.002). Physical activity of male farmers is dominated by sufficient physical activity (79.2%) and female farmers are dominated by lack of physical activity (55.7%). Male farmers were 1.79 times more likely to have sufficient physical activity than female farmers (RR= 1.79; 95% CI=1.31-2.45; p-value= 0.002.).
Conclusions: The physical activity among farmers are differenced by gender. Therefore, fulfillment of physical activity by gender should be improved among farmers to reduce NCDs.

Key Words: Physical Activity, Farmer, Gender, Non-Communicable Disease, Posbindu PTM

Introduction

Mortality from Non-Communicable Diseases (NCDs) in Indonesia is relatively high (World Health Organization, 2018). The incidence of heart disease and stroke is higher in men than women, but the incidence of heart attack, hypertension, Diabetes Mellitus (DM) and Congenital Heart Disease (CHD) is higher in women than men (Allender, Rector and Warner, 2010). NCDs is a long-lasting disease and often occurs in farmers in Indonesia. Behavioral factors that can affect the occurrence of NCDs among farmers are related to unhealthy lifestyles, like eating less fruits and vegetables, smoking, consuming alcoholic

beverages and lack of daily physical activity (Kementerian Kesehatan RI, 2019; Peters *et al.*, 2019).

Lack of daily physical activity is one of the factors causing NCDs (World Health Organization, 2018). According to WHO 2018, lack of daily physical activity increases mortality risk by 20%-30% compared to sufficient daily physical activity, which is 150 minutes per week with moderate intensity continously (Dewi and Wuryaningsih, 2019). Farmers has daily physical activity with a high level of energy expenditure (Dufour and Piperata, 2008). It is caused by physical activity which carried out by farmers is in the form of bringing and lifting weights (Racine *et al.*, 2012). The daily physical activity of farmers in Indonesia is different, this is influenced by gender differences (Susanto, Purwandari and Wuri Wuryaningsih, 2017).

Gender is an individual biological factor that could not be modified. Physiologically, there are differences in the structure and function of hormones between men and women that could affect daily physical activity (Guyton and Hall, 2011). Gender is closely related to the influence of the surrounding culture. In some regions in Indonesia, there was still a gender gap that women are lower than men (Rochmansyah, 2016). So that the physical activity of male farmers is more varies than women based on assumption that men are more capable of doing heavy physical activity and it was their obligation (Jiang, Lin and Yonto, 2020). Based on research conducted by Patil and Babus (2018), it was stated that the gender gap in agriculture in developing countries can hinder and reduce the contribution of women in agriculture.

Indonesia is a country with a high mortality rate due to NCDs, by 73% per year 2016 (World Health Organization, 2018). Therefore, to reduce mortality risk due to NCDs, comprehensive and optimal prevention is needed, that through the Integrated of NCDs Post. The Integrated of NCDs Post or Pos Pembinaan Terpadu Penyakit Tidak Menular (Posbindu PTM) is an effort to control community-based NCDs risk factors that is carried out independently and continuously.

The implementation of Posbindu PTM includes promotive, preventive and early follow-up efforts for NCDs risk factors (Kementerian Kesehatan RI, 2019). However, until now the implementation of Posbindu PTM activities has not been able to control the incidence of NCDs. This was evidenced by the prevalence of NCDs which had increased every year (Kementerian Kesehatan RI, 2018). Based on the results of the literature study conducted by Mahdur and Sulistiadi (2020), Posbindu PTM target was not achieved due to sufficient quantity of the target itself but lack of quality human resources, the lack of partnerships in meeting the funding activities needs and the non-routine implementation of Posbindu PTM causing a decrease in visitors and the level of community enthusiasm.

From a preliminary study of secondary data in 2019 at the Pakusari Health Center, Jember Regency, it was found that were 1.344 participants of Posbindu PTM. The number of NCDs cases found in the form of hypertension showed varying results every month, that is 1.6% in January, 3.6% in February and 5.2% in March. This is also found in DM cases, that is 8.5% in January, 18.3% in February and 32.3% in March. From these data, it could be seen that the prevalence of NCDs in the Pakusari Health Center was quite high and had increased every month. Therefore, the researchers wanted to identify the relationship between gender and the physical activity among farmers that could affect the incidence of NCDs based on data analysis of the Posbindu PTM of Pakusari Health Center Jember Regency in 2020.

Methods

Design and participants

This research was done quantitatively with comparative analytic nature, using a Retrospective Cohort approach to analyze differences in physical activity between male and female farmers in the Pakusari Health Center, Jember Regency in 2020. The data were obtained from results in the report of Posbindu PTM according to the Healthy Registered Card or Kartu Menuju Sehat Faktor Risiko Penyakit Tidak Menular (KMS FR-

PTM) of Posbindu PTM in Pakusari Public Health Center, Jember Regency during January-October 2020.

The data in this study were all farmers in Pakusari Health Center in 2020 who were registered in Posbindu PTM activity and were divided into 5 (five) areas, that are Health Center (HC) of Bedadung, Kertosari , Suboh, Sumberpinang and Pakusari among 345 farmers in January-October 2020. The sample was taken by using purposive sampling technique, through data screening based on inclusion and exclusion criteria. Data selection among 345 farmers were identificated: 16 data had no history of physical activity recorded, 123 data were age >64 years and 94 data had physical activity recorded for less than 3 months. The total sample of data collected was 112 data of respondent

Instruments

This study used secondary data in the form of occupation, age, gender, education, religion, ethnic, marital status, physical activity history and history of NCDs farmers which are filled in by simple interviews. The assessment of physical activity in the KMS FR-PTM was carried out by health services or health workers with the provision of lack physical activity if regular physical activity is < 3 times per week or < 150 minutes per week and physical activity is sufficient if regular physical activity is 3-5 times per week or 150 minutes per week (Appendix 1) (Kementerian Kesehatan RI, 2019; Susanto *et al.*, 2020). The research was conducted by collecting, analyzing and examining the available data.

Data collection

The data were collected through surveys of KMS Posbindu PTM. Firstly, the head of Pakusari Public Health Centre received an explanation regarding the aims and objectives of the study. The researchers coordinated with the person in charge of Posbindu PTM programs at Pakusari Public Health Centre of Jember regency and processed the data obtained so that it could be analysed and a conclusion was drawn.

Data analyses

Data processing in this study used the SPSS 23 program which was carried out through the step of editing, coding, entry and cleaning. Data were analyzed by univariate analysis and bivariate analysis. Univariate analysis in the form of descriptive statistics, that were frequency (n) and percentage (%) to analyze categorical data and numerical data presented in the Mean (M), Standard Deviation (SD), median value (Md) and the 25th and 75th percentiles (P25-P75) or called Quartile 1 – Quartile 3 (Q1-Q3). The bivariate analysis in this study used Kolmogorov Smirnov test (p-value > 0.05) to test the data normality, Mann Whitney test (p-value < 0.05) to analyze the relationship between age characteristics data and research variables and Chi Square test (p-value < 0.05) to test a hypothesis of this study that was about the difference in physical activity between male and female farmers with Confidence Interval = 95%.

Results

The results of this study were obtained from the observation of secondary data on the performance report of Posbindu PTM in Pakusari Public Health Center, Jember Regency which includes physical activity among male and female farmers with their characteristics. Characteristics among respondents consist of occupation, age, education, religion, ethnic, marital status and history of NCDs farmers. Observations on the physical activity among farmers regarding their gender and characteristics were carried out to determine the differences in the physical activity among male and female farmers with all the characteristics that might affect them, as presented in the following Table 1

Table 1. Characteristics among Posbindu PTM Participants in Pakusari Public Health Center

Characteristics	Male (n=24)	Female (n=88)	χ2	*p*-value
Age (years)				0.095[a]
Mean ± SD, Md (P_{25}-P_{75})	51.67±8.138 years old	50 (42-56) years old		
Ethnic (n, %)				0.111[b]
Madura	21 (18.75)	85 (75.89)		
Java	3 (2.68)	3 (2.68)		
Education (n, %)			3.626	0.305[c]
Not Attending School	2 (1.79)	2 (1.79)		
Elementary School	14 (12.5)	42 (37.5)		
Junior High School	5 (4.46)	24 (21.43)		
Senior High School	3 (2.68)	20 (17.86)		
Religion (n, %)				
Islam	24 (21.4)	88 (78.6)		
Marital Status (n, %)				
Married	24 (21.4)	88 (78.6)		
Occupation (n, %)				
Farmer	24 (21.4)	88 (78.6)		
NCDs History (n, %)			0.012	0.915[c]
Yes	8 (7.14)	26 (23.21)		
No	16 (14.29)	62 (55.36)		

[a]Significant with Mann Whitney U Test.
[b]Significant with Fisher's Exact Test
[c]Significant with Chi Square Test

Based on the Tabel 1, it shows that 112 Posbindu PTM participants in Pakusari Public Health Center consist amount 24 male farmers (21.4%) and 88 female farmers (78.6%). Posbindu PTM participants were dominated by pre-elderly participants (45-59 years old) with occupation as farmers (100%) and Madurese (94.6%). The majority of the participants' education was elementary school (50%), married (100%) and Muslim (100%). In addition, 30.4% had a family or personal history of NCDs. The results of data analysis on characteristics of age (p-value 0.095), ethnic (p-value 0.111), education (p-value 0.305; 2=3.626) and history of NCDs (p-value 0.915; 2=0.012) showed no differences among characteristics between male and female farmers (p-value > 0.05).

Furthermore, to find out the possible factors that influence the difference in physical activity between male and female farmers, an analysis of the respondent's characteristics data presented in the following Table 2:

Table 2. Characteristics among Posbindu PTM Participants Based on Physical Activity between Male and Female Farmers in Pakusari Public Health Center

Characteristics	Gender	Farmers Physical Activity n (%)		Total n (%)	χ^2 (*p*-value)	For *Cohort* (95% CI: Min-Max)	
		No/Lack of Physical Activity	Yes/ Sufficient Physical Activity			No/Lack of Physical Activity	Yes/Sufficient Physical Activity
Ethnic n (%)							
Madura	Male	5 (4.72%)	16 (15.1%)	21 (19.8%)	6.679 (0.01)	0.431	1.704
	Female	47 (44.34%)	38 (35.85%)	85 (80.2%)		(0.196-0.947)	(1.218-2.385)
Java	Male	0	3 (50.00%)	3 (50%)	(0.4[a])		3
	Female	2 (33.3%)	1 (16.7%)	3 (50%)			(0.606-14.864)
Education n (%)							
Not Attending School	Male	0 (0.0%)	2 (50.0%)	2 (50.0%)	(0.333[a])		
	Female	2 (50.0%)	0 (0.0%)	2 (50.0%)			
Elementari School	Male	3 (5.4%)	11 (19.6%)	14 (25%)	12.078 (0.001)	0.29	3
	Female	31 (55'4%)	11 (9.6%)	42 (75%)		(0.105-0.804)	(1.685-5.341)
Junior High School	Male	1 (3.4%)	4 (13.8%)	5 (17.2%)	(0.169[a])	0.343	1.92
	Female	14 (48.3%)	10 (34.5%)	24 (82.8%)		(0.058-2.044)	(1.007-3.660)
Senior High School	Male	1 (4.3%)	2 (8.7%)	3 (13.0%)	(0.356[a])	3.333	0.741
	Female	2 (8.7%)	18 (78.3%)	20 (87.0%)		(0.420-26.446)	(0.328-1.671)
NCDs History							
Yes	Male	2 (5,88%)	6 (17,65%)	8 (23,5%)	(1[a])	0.813	1.083
	Female	8 (23,53%)	18 (52,94%)	26 (76,5%)		(0.215-3.077)	(0.674-1.742)
No	Male	3 (3,8%)	13 (16,7%)	16 (20,5%)	11.51 (0.001)	0.284	2.399
	Female	41 (52,6%)	21 (26,9%)	62 (79,5%)		(0.101-0.799)	(1.576-3.651)

[a]Significant with *Fisher's Exact Test*

The Table 2 reflect that could be seen the ethnic, education and individual or family NCDs history affect the physical activity among male and female farmers in Pakusari Public Health Center. Madurese male farmers were 1.7 times more likely to have sufficient physical activity than Madurese female farmers ($\chi2$=6.679; p-value 0.01; RR=1.704; 95% CI=1.218-2.385). Male farmers with education backround from elementary school were 3 times more likely to have sufficient physical activity than female farmers ($\chi2$=12.078; p-value 0.001; RR=3; 95% CI=1.685-5.341). Furthermore, male farmers

who did not have an individual or family history of NCDs were 2.4 times more likely to be physically active than female farmers ($\chi 2$=11.51; p-value 0.001; RR=2.399; 95% CI=1.576- 3,651).

Measurement of physical activity between male and female farmers themselves could be seen in the following Figure 1:

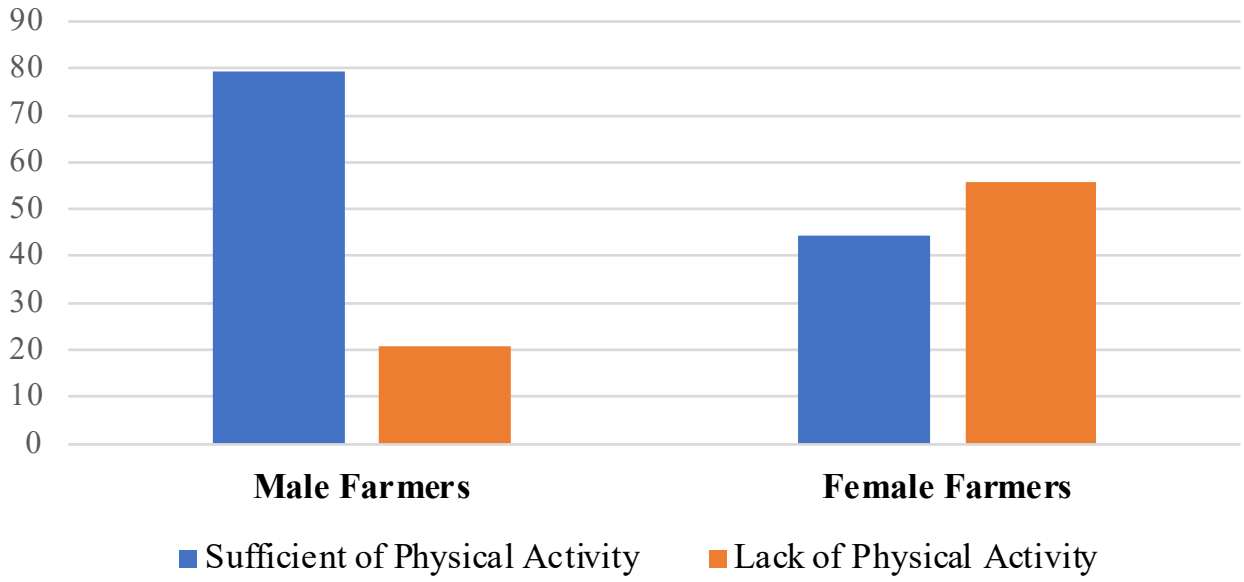

Figure 1. Proportion of Physical Activity among Farmers in Pakusari Public Health Center

The data analysis in Figure 1 showed that from a total of 24 male farmers in Posbindu PTM activity at Pakusari Publis Health Center, it was found that there was a dominance of participants who had sufficient physical activity which regular physical activity 3-5 times per week or 150 minutes per week, and from a total of 88 female farmers found that there was a dominance of participants who had lack of physical activity, which regular physical activity < 3 times per week or < 150 minutes per week. Furthermore, the differences in physical activity between male and female farmers were presented in Table 3 below:

Table 3. The Differences in Physical Activity between Male and Female Farmers in Pakusari Public Health Center, Jember Regency 2020

Gender n (%)	Farmers Physical Activity n (%)		Total n (%)	χ^2 (*p*-value)	For Cohort (95% CI: Min-Max)	
	No/Lack of Physical Activity	Yes/Sufficient of Physical Activity			No/Lack of Physical Activity	Yes/Sufficient of Physical Activity
Male	5 (4.46%)	19 (16.96%)	24 (21.4%)	9.172 (0.002)	0.374 (0.168-0.834)	1.786 (1.308-2.439)
Female	49 (43.75%)	39 (34.82%)	88 (78.6%)			

Source: secondary data of Posbindu PTM in Pakusari Public Health Center, Jember Regency 2020

The Table 3 discribe that there were differences in physical activity between male and female farmers in Pakusari Public Health Center (χ2=9,172; p-value <0.05=0.002). Furthermore, based on Relative Risk, it was known that male farmers had a probability of 1.79 times for sufficient physical activity compared to female farmers (95% CI=1.31-2.45).

Discussion

The result of this study showed that physical activity on man was difference than woman in Posbindu PTM Pakusari Health Center, this study were in line with previous research conducted by Jiang et al. (2020) which stated that there were differences in physical activity and health impacts between women and men in rural Laos. Therefore, it was a necessary to control a healthy lifestyle with regular sufficient physical activity and independent health checks to the nearest health service or through community-based health services, that was Posbindu PTM.

The prevalence of male farmers with sufficient physical activity was more dominant (79.2%). This was possible because the respondent's type of work was a heavy physical activity, that was farmers (100%), so that it could affect the adequacy of daily physical activity. It was related to the intensity and duration of what male farmers do, for example plowing the fields with tools or cattle (Mas'udi, 2017; Umamah, 2019). This activity was classified as heavy because it used a tool with a heavier load compared to the farmer's

body weight, therefore the energy requirement for the muscles to contract was large (Guyton and Hall, 2011). Work and moving activities were related to the physical fitness condition of the body (Rahmawati, Suroto and Wahyuni, 2016), so that sufficient physical activity during work would have a positive impact on health.

The results also showed that the prevalence of female farmers with a lack of physical activity in Pakusari District was more dominant (55.7%). This was possible because the low knowledge of married women farmers could be seen from the dominant education level from elementary school (37.5%) and the culture of gender roles was known from marital status (100%) in Pakusari District. According to Juniarta & Lentari (2020), education for women was considered very important because it would have an impact on the level of knowledge they have. The lack of knowledge obtained from formal or informal education had a contribution to individual decision making in healthy living behavior. Having more information on women farmers, the risk of life behavior would not decrease (Pradono and Sulistyowati, 2014). In addition, married female farmers would have their own role in the family environment, that was as a wife who was responsible in house (Friedman, Bowden and Jones, 2010), so that female farmer would spend more time in the house. Therefore, to be able to fulfill daily physical activity, female farmers could do sports on the sidelines of physical activity at home and it is important for farmers to increase their knowledge to understand the impact of physical activity carried out.

Madurese culture did dividing work equally between men and women in the family, but men continue to do heavy work that women farmers could not do. In addition, the socioeconomic level of the family also affected the physical activity among male and female farmers (Friedman, Bowden and Jones, 2010). Currently, several regions in Indonesia still apply a patriarchal culture (gender role ideology) in everyday family life (Rochmansyah, 2016), so that the roles played among men and women were adjusted to the

gender roles that are believed to be in the surrounding tribal culture. The division of roles based on gender traditionally placed men more active than women because men had to be the breadwinners of the family in providing for the family's economic needs (Juniarta and Lentari, 2020). An example in the field which shows that men are more dominant than women in the implementation of Posbindu PTM, male participants conduct an examination first before female participants. This was possible because men have to go to work immediately. Some women did physical work as an effort to help men (husbands) meet family needs (Iftidah, 2019).

In addition, the fulfillment of physical activity needs between male and female farmers was influenced by other factors such as farmers' physiological factors. According to Guyton & Hall (2011) the basic physiology that makes the physical activity among male and female farmers different is the differences in body size, body composition and the presence or absence of the sex hormone testosterone in the body. The muscle mass of men is more than women, this is what allows male farmers to meet the needs of physical activity according to the 2010 WHO recommendations by doing more diverse activities and classified as heavy activities.

Furthermore, the average age of farmers was pre-elderly (45-59 years), with increasing age there would be a decrease in the body's ability to carry out activities and there would be increased concern about the risk of disease events that could increase anxiety and interfere with daily activities (Kusuma and Ardani, 2018). In addition, individual or family history of NCDs could increase concerns among farmers [24], this would have an impact on increasing anxiety about body condition. Excessive anxiety could interfere with daily activities. The absence of an individual or family history of NCDs would reduce concerns about the risk of illness. Therefore, farmers need to carry out routine health checks independently to the nearest health service or through community-based health services like Posbindu PTM for early detection of NCDs risk factors and current

health conditions. It was hoped that this examination would increase the motivation among farmers who were still lack of physical activity to meet their daily physical activity needs so as to reduce the risk of NCDs.

Farmers' physical activity habits could have an impact on health conditions because physical activity was one of the risk factors for NCDs (World Health Organization, 2018). Other studies had stated that regular and adequate physical activity would have a positive impact on the musculoskeletal, cardiovascular, respiratory and endocrine systems which would be consistent with a number of health benefits, that a reduced risk of premature death, CHD, hypertension and DM (Chung et al., 2017). However, it should be noted not to do excessive physical activity because it will also have a bad impact on health. According to Susanto et al. (2017) excessive physical activity of farmers combined with work environment factors will have a negative impact in the form of malnutrition, stress, joint and bone pain.

Occupational Health Nurses (OHN) could focus promotive and preventive efforts on farmers in their work environment to create a healthy and safe work environment, emphasizing individual health, safety, and injury prevention (Guzik, 2013; Susanto, Purwandari and Wuri Wuryaningsih, 2017), while Family health nurses focus on family efforts in solving problems and maintaining the health of family members (Susanto, 2012). Nurses or health workers could create routine activities in the form of physical activities carried out with the community. Agricultural areas with low levels of education will really need promotive and preventive efforts from nurses in the form of education related to healthy lifestyle habits in family settings and in the community as a reduction in NCDs risk factors.

Limitations

The limitations in this study were due to the non-routine visits of participants to Posbindu PTM, it caused several data must be eliminated. A small amount of data can cause a lack of data variation that affects the results

of this study. Besides the incomplete data in at least the variables studied, so that it can also cause the interpretation to be less broad. So the next researchers can use primary data which needed to get a wider interpretation of the results and more complete data in its research.

Conclusion

There are differences in physical activity between male and female farmers in the Pakusari Public Health Center, Jember Regency. This study show that the physical activity among male farmers in Posbindu PTM at Pakusari Public Health Center is dominated by sufficient physical activity, while female farmers are dominated by lack of physical activity. Male farmers probably are 1.79 times more likely to be physically active than female farmers. Things that may affect the physical activity of farmers is the level of education and knowledge. Education was considered very important because it would have an impact on the level of knowledge they have. Therefore, it is important to provide farmers with an understanding of the impact of sufficient physical activity.

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