Conference Paper

The Impact of Worker Health Promotion on the Knowledge, Attitude and Health Status of Employees of Universitas Indonesia in 2017

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Received: 15 May 2018
Accepted: 3 June 2018
Published: 19 June 2018

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the ICOHS 2017 Conference Committee.

1. Preface

The WHO's Global Report on Noncommunicable Diseases (NCDs) reported that 63 percent of deaths are attributable to NCDs. Based upon WHO Global Observatory 2011 data, the percentage of deaths in Southeast Asia due to NCDs is 55 percent. In Indonesia, the number of deaths due to NCDs increased from 37 percent in 1990 to 57 percent in 2015 [1]. Worldwide, the most common NCDs causing death are heart disease (17.5 million people per year) followed by cancer (8.2 million), respiratory disease (4 million), and diabetes (1.5 million) [2].

Research conducted by Hardjojo in 2012 [3] states that the number of university employees who may potentially have cardiovascular disease (CVD) is 26.8 percent (120 people out of 447), which was based upon their cholesterol level, LDL, blood pressure, blood glucose level, smoking habits, and family history. In 2016, medical examinations of 880 staff members of the administrative center at Universitas Indonesia (UI) indicated that 41.1 percent of employees were obese, 29.8 percent had high total cholesterol, 38.1 percent had high LDL, and 14.0 percent had prehypertension or hypertension. Obesity, hyperlipidemia, and hypertension are risk factors for heart disease [4], and therefore, preventive measures are needed so that these existing risk factors do not develop into heart disease.

One preventive measure that can be taken is promoting health in the workplace. During a six-year cohort study conducted by Eng (2016) on university employees, it was found that health promotion in the workplace reduced the risk of hypertension among employees [5]. Based upon the aforementioned results of the staff medical examination results, UI administrative employees have a risk for CVD. In order to prevent existing risks from increasing and developing into disease and to keep employees

healthy, it is necessary to implement a health promotion program for employees. In addition to providing employees with interventions that promote better health, this study will also look at the effect that these health promoting interventions have had in the workplace on the knowledge, attitude, and health status of employees by studying them before and after the intervention.

The general objective of this study was to evaluate the effect that health promotion has had on the knowledge, attitude, and health status of the UI administrative staff in regard to CVD with the specific purpose of identifying their non-modifiable and modifiable risk factors (age, sex, family history, blood pressure, physical activity, obesity, and diabetes mellitus). Another general objective of this study was to evaluate the effect that health promotion has had on the health status of the UI administrative staff by testing their blood pressure, body mass index (BMI), blood glucose, and cholesterol and evaluating the intervention efforts that are undertaken based on the implementation of the five stages for health promotion of the Ottawa Charter. The scope of this study was to perform health promotion interventions for the UI administrative staff for three months by providing health promotion flyers to employees, selecting health ambassadors, providing mentoring on the health promoting materials, directing the practice of physical exercise, and introducing the nutrients in food in an interactive workshop, which were all assessed by before and after measurements of the staff's knowledge, attitude, and health status.

2. Methods

The research design used in this project was quasi-experimental and designed to understand the influence that the health promotion intervention had on the knowledge, attitude, and health status of the campus administration employees of UI. The employees were evaluated by the results of medical and other examinations after the intervention.

$$O1 \longrightarrow X \longrightarrow O2$$

Figure explanation:

O1 = Employee group that has a risk of CVD and a non-risk group (variables: health status, knowledge, and attitude) before intervention

X = Intervention in the form of health promotion (university policy, establishment of health promotion group, counseling, flyer distribution, health messages, empowerment of health ambassadors, and health promotion media in clinic)

O2 = Employee group that has a risk of CVD and a non-risk group (variables: health status, knowledge, and attitude) after intervention

The place where the research was conducted was on the UI campus in Depok and Salemba. The study was conducted from October 2016 to June 2017. The total number of employees of the UI administrative center is 1034; however, only 880 people participated in the health examination. Primary data needed in this study was the employees' level of knowledge and attitude toward physical activity and healthy food, which are modifiable CVD risk factors, obtained by using a questionnaire. Based on a validity test, all questions were declared valid and reliable with Cronbach's alpha values ranging from 0.728–0.765 for the entire question group. Questionnaires were administered before and after the interventions, and health status was also measured after the intervention through another medical examination. The other primary data required was the result of the employee's health measurements (individual data) before and after the intervention. Secondary data was health examination data from 2016 obtained from the Safety, Health, and Environment Division and Human Resource Division. Data analysis was performed by using a statistical test, which was a pair sample *t*-test, to see the difference before and after the health promotion intervention. The significance value used was $p < 0.05$.

3. Results

3.1. Respondent background

Most of the respondents came from the Library Division, and 70.6 percent of the respondents were women. The majority age range of the respondents was 25–40 years old. A total of 55.4 percent of the respondents were ethnically Javanese, and 41.7 percent of the respondents had worked in the university administration for one to five years. A total of 48 percent of the respondents were permanent university employees, and 52 percent of the respondents were undergraduates. A majority of the respondents were married. Among the respondents, 6.9 percent had been diagnosed with hypertension, 8.8 percent with hyperlipidemia, and 2.6 percent with diabetes mellitus. Further, 34.8 percent of the respondents had a parent (father or mother) who had been diagnosed with hypertension and with 6.4 percent still suffering from it, 13.7 percent had been diagnosed with hyperlipidemia and with 9.3 percent still suffering from it, 12.7 percent had been diagnosed with CVD and with 3.9 percent were

still suffering from it, 23 percent had been diagnosed with diabetes mellitus, and 3.4 percent had suffered a stroke.

3.2. Results of the food frequency questionnaire

Before the intervention, the respondents consumed carbohydrates daily, which was primarily white rice. The respondents consumed eggs, fish, tempeh, tofu, and chicken two to three times per week to meet protein needs. For fat intake, the respondents consumed red meat, full cream milk, butter, and cheese two to three times per week. The respondents had a pattern of consuming fruit (bananas, papayas, oranges, apples, melon, mangos, and watermelon) two to three times per week, while their intake of vegetables (carrots, corn, spinach, green cabbage, beans, beans, kale, and broccoli) was also two to three times per week but with a habit of changing the kind of vegetable consumed each time. The respondents consumed various fried foods and processed chicken and meat once every two to three weeks. After the intervention, the respondents still maintained their consumption patterns except that their protein intake increased its frequency to become daily.

3.3. Results of the respondent knowledge assessment

Based on the results of the assessment judging the knowledge level of the respondents regarding physical activity and healthy food before and after the intervention, their physical activity knowledge before the intervention had an average score of 68.33 out of 100 and their healthy food knowledge had an average score of 57.70 out of 100. After the intervention, the level of knowledge of the respondents for physical activity rose to 84.37 out of 100 and for healthy food to 80.50 out of 100, so there was an increase in the knowledge of both physical activity and healthy food.

The increase in the score for physical activity knowledge was 16.22 points and for healthy food knowledge was 20 points. Since the p-value for physical activity knowledge was 0.095, there was no significant difference between the assessment of physical activity knowledge before and after the health promotion intervention. However, the p-value for healthy food knowledge was 0.004, and so there was a significant difference between the assessment of healthy food knowledge before and after the health promotion intervention.

3.4. Assessment results for a healthy attitude

Through the results of this study, it was possible to assess respondent attitudes toward physical activity and healthy food both before and after the intervention. The score for their attitude toward physical activity before the intervention had an average value of 79.82 out of 100 and their attitude toward healthy food had an average value of 74.03 out of 100. The score after the intervention was 85.06 out of 100 for physical activity and was 79.58 out of 100 for healthy food.

The physical activity attitude score increased by 4.01 points (p-value = 0.006), so there was a statistically significant difference before and after the intervention. The healthy food attitude score increased by 4.94 points (p-value = 0.357), so there was no significant difference before and after the intervention.

3.5. Assessment of the health examination results

The assessment of health status was defined by the parameters of body mass index, blood pressure, blood glucose, and cholesterol. There were different scores for each of the health parameters assessed. The p-value for each parameter was 0.0001, which means that there was a significant difference in the assessment of each health parameter before and after the intervention.

4. Discussion

4.1. Research limitations

This study assessed the characteristics of the respondents' knowledge and attitude through a questionnaire, so the honesty of the respondents greatly affects the results. This study originally intended to target the entire population to be researched, but only 104 staff members participated in entire process until the post-intervention health examination. Nevertheless, the number of respondents was still representative of the entire population when calculated by a sample size formula [6]. Based on these calculations, the required sample is 86.67 or 87 respondents. Therefore, the number of respondents in this study met the requirements regarding the number of samples.

4.2. Identification of risk factors for CVD

AgeSixty percent of the respondents who participated in this study were between 25–40 years old. In the National Health and Nutrition Examination Survey 2009–2012 in the United States, the prevalence of heart disease increased significantly for those age 40 and older. The percentage of participants over 40 years old was 31 percent or 64 people at risk for CVD.

GenderAs many as 71 percent of the respondents who participated in the full study were women, and 29 percent were men. According to the American Heart Association, men are at higher risk for CVD. This is influenced by the presence of hormones in women of childbearing age that can lower blood cholesterol levels and reduce the risk for CVD [7]. This is in line with research conducted by Mozzaffarian et al. (2015) that showed that at ages over 80, the prevalence of women experiencing CVD was higher than in men. The current study showed that both men and women alike are at risk for CVD.

HeredityHereditary factors for CVD are caused by chromosomal mutations. In this study, the number of respondents who had a hereditary risk of hypertension was 84 people or 41.2 percent, coronary heart disease was 34 people or 16.6 percent, hyperlipidemia was 47 people or 23 percent, diabetes mellitus was 53 people or 25.9 percent, and stroke was 33 people or 17 percent.

According to the U.S. Centers for Disease Control and Prevention (2014), genetic factors are likely to play some role in high blood pressure, heart disease, and other related conditions. However, it is also likely that people with a family history of high blood pressure share common environments and other potential factors that increase their risk.

4.3. Identification of modifiable CVD risk factors

From research conducted by Chen (2013) on populations in East Asia, it was found that people with a BMI 25 and above had an increased risk of death from CVD [8]. Before the intervention, 43 people or 41.3 percent of respondents had a BMI > 25, and after the intervention, 46 people or 44.2 percent had a BMI > 25. Further improvement needs to take place both on the duration of the intervention and the duration of other assistance in order to improve the BMI in the respondents.

The number of participants with high blood pressure (> 120/80mmHg) increased from 18 to 28; however, the average systolic blood pressure among respondents

decreased slightly by 0.1 points and the average diastolic blood pressure by 2.00 points. According to the statistical analysis, there was a significant difference in the mean blood pressure before and after the intervention. The effectiveness of this intervention needs to be improved because in a six-year cohort study on university staff conducted by Eng et al. [5], health promotion in the workplace can reduce the risk of hypertension among employees. A sustainable health promotion program can be the key to this success.

The number of respondents who had high total cholesterol (> 200mg/dL) increased from 37 to 42 people; however, the average total cholesterol among respondents decreased slightly by 0.11 points. According to the statistical analysis, there was a significant difference in the mean total cholesterol before and after the intervention. A health promotion program at the workplace conducted for one year and four days by Muto & Yamauchi in 2001 [9] showed that health promotion programs were able to improve total cholesterol. The health promotion program at UI used the same methods as this program, but improvements are required for UI.

The number of respondents who had blood glucose levels greater than 140mg/dL increased from four to five people; however, the average blood glucose level among respondents decreased slightly by 0.74 points. According to the statistical analysis, there was a significant difference in the mean of blood glucose levels before and after the intervention. The same study conducted by Muto & Yamauchi in 2001 also showed that health promotion activities can improve blood glucose levels and can reduce the risk of CVD.

4.4. Impact of the health promotion intervention on knowledge

Based on the results of this study, there was an increase in knowledge on both physical activity and healthy food from the intervention. The increase in the score for knowledge of physical activity was 16.22 points (p-value = 0.095) and the increase for healthy food was 20 points (p-value = 0.004). There was a significant increase in healthy food knowledge among participants before and after the intervention. The greater knowledge of the respondents afterward successfully increased the capacity of their individual knowledge and skill.

4.5. Impact of the health promotion intervention on attitude

Based on the results of this study, there was an increase in the average score regarding attitudes toward physical activity and healthy food after the intervention. Respondent attitudes on physical activity improved by 4.01 points (p-value = 0.006), and this was a statistically significant increase from before to after the intervention. Respondent attitudes toward healthy food also improved by 4.94 points (p-value = 0.357). The increase in the average score in respondent attitudes from before to after the intervention could indicate elevated individual self-efficacy to adopt healthy behaviors.

4.6. Effect of the health promotion on health status

The parameters for health status were defined by body mass index, blood pressure, total cholesterol, and blood glucose level. Based on the results of the medical examination carried out after the intervention, there were significant differences between the average scores for each parameter. Furthermore, the post-intervention medical exam for this study found an increase in the number of employees at risk for CVD. This is a point to consider for the evaluation of further health promotion programs.

4.7. Comparison of respondent food frequency

Food consumption surveys were conducted using the Food Frequency Questionnaire (FFQ), which contains a list of foods and beverages. The FFQ used in this study was adopted from the EPIC-Norfolk Food Frequency Questionnaire of University of Cambridge. The food patterns of respondents did not change much before and after the intervention. Changes in consumption patterns occurred only for protein intake, which went from two to three times a week before to daily afterward. The frequency of fat and processed food intake remained the same. Also, the frequency of fruit and vegetable intake needs to be improved.

4.8. Health promotion strategies from the Ottawa charter

4.8.1. Build healthy public policy

Policies related to occupational health, especially to health promotion, are contained in UI Rector Regulation no. 01 of 2016 for the Implementation of Occupational Safety,

Health, and Environment of UI Article 5 regarding the commitment to prevent occupational diseases and implement occupational health and safety management throughout the academic community [10]. This policy is the basis for various health promotion programs. The implementation of this policy can be seen through the support for funds for health promotion activities conducted at UI. Nevertheless, there is still a need for additional health-related regulations or guidelines that include health promotion to further strengthen the legal basis for the implementation of health programs at UI.

4.8.2. Create supportive environments

A supportive environment in the Ottawa Charter refers to all systems that support the creation of healthy workers. By conducting health promotion at UI, a supportive environment is created through the availability of facilities and infrastructure that make it possible for all employees to implement a healthy lifestyle. UI's health supporting facilities include a pedestrian walk, campus bicycles, a campus bike path, an outdoor physical activity field, an indoor physical activity field (gymnasium), a fitness center available at the faculty club UI, and a green open space area that can be used to exercise.

4.8.3. Strengthen community actions

UI, through its health promotion program, selects health ambassadors from each work unit as representatives. For the election of UI health ambassadors, recruitment is open to volunteers from any unit. The role and responsibilities of UI health ambassadors is to promote health, remind colleagues to perform physical activities, and remind colleagues to stretch during work hours. The health ambassadors of UI also actively exercise both in the campus environment and off campus. Until the trial period ends, some of the health ambassadors will continue to routinely do their job of reminding their colleagues to stretch. To improve the health of employees, a sustainable program is needed; therefore, the UI health ambassadors program needs to be maintained and then monitored every month.

4.8.4. Develop personal skills

The Occupational Safety and Health Unit, human resources, and the campus clinic have collaborated to create a workshop for the entire university staff. The health workshop

program is an annual program. In the latest health promotion workshop in 2017, the participants were able to have hands-on practice of physical activities, learn how to do effective stretching in the workplace, and have direct instruction learning about food labelling. After the workshop, UI health ambassadors were selected to promote the health campaign in their respective work units.

4.8.5. Reorient health services

Curative and rehabilitative health services at UI are managed by university clinic. Aside from these services, it also provides promotive and preventive services. The clinic also conducts a medical checkup (MCU) for all employees of UI. Based on the results of the MCUs, various health promotions to improve health awareness of certain diseases are conducted. The clinic also has a counseling center for those who need health consultation assistance.

5. Conclusion

1. CVD Risks
    a. Factors that cannot be modified:

        Respondents over 40 years old were 31 percent or 64 people. Men and women were equally at risk of CVD. Respondents with a hereditary risk were 34.8 percent for hypertension, 13.7 percent for hyperlipidemia, 12.7 percent for coronary heart disease, 23 percent for diabetes mellitus, and 3.4 percent for a stroke.

    b. Factors that can be modified

        Prior to the intervention, 37 respondents had high total cholesterol, 18 had hypertension, 48 people were overweight or obese, and four people had high blood glucose levels (a risk for diabetes mellitus).

2. Before and after, there were significant differences between respondent knowledge related to healthy food and no significant differences between respondent attitudes related to physical activity

3. There were significant differences between the health status of the respondents before the intervention and after the intervention (p = 0.0001).

4. The Ottawa Charter for Health Promotion has already been implemented.

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