# Pattern and Correlates of Exercise in Hospital Staff

**Siriporn Burapadaja*, Duangporn Winijkul, Sakchai Ausayakhun and Pariya Tantipatananant**

*Faculty of Pharmacy, Chiang Mai University, Chiang Mai 50200, Thailand*

**Corresponding author. E-mail: siriporn@pharmacy.cmu.ac.th*

## ABSTRACT

***Regular exercise beneficial to health is a public recommendation for health promotion. Hospital staff responsible for health promotion are expected to play a key role in getting exercise, but how active they are has not been revealed. The objective was to examine the exercise pattern of hospital staff and the factors associated with their exercise. This study used Social Cognitive Theory to develop studied factors, and hypothesized that perceived benefit of exercise, perceived barrier of exercise, like to exercise, self-efficacy to exercise, personal influence on getting exercise, place for exercise and situation about exercise could affect exercise in hospital staff. A cross-sectional study using a self-administered questionnaire was conducted in a random sample (n=320), selected from a hospital staff list. Eighty three per cent of respondents reported getting exercise but only 8% reported getting sufficient exercise. The older staff got more exercise than the younger one. The staff without disease reported getting more exercise than those with disease. Factors affecting exercise included situation about exercise, place for exercise, like to exercise and perceived barrier of exercise. These findings suggested that most hospital staff got insufficient exercise and interventions to initiate and promote all of them to get sufficient exercise required.***

**Key words:** Exercise pattern, Exercise correlates, Hospital staff, Social Cognitive Theory

## INTRODUCTION

### Background

Regular exercise can reduce the risk of several health problems, such as cardiovascular disease, diabetes, obesity, colon cancer and osteoporosis (Clara et al., 2003; Plotnikoff et al., 2004; Kandula and Lauderdale, 2005). Exercise can also provide advantage to mental health (Bergasa et al., 2004; Dunn et al., 2005) and improve quality of life (Teoman et al., 2004). Thus, exercise is a public recommendation for health promotion. In Thailand, the Ministry of Public Health's concern with health promotion has led to the plan of health-promotion hospital in 2000. The plan objective is to promote health of all hospital staff in order that they would further transfer and initiate patients, patients' relatives and people in the community to participate in health-promoting activity. This studied hospital has used exercise as an activity to promote health since 2000. It was found that general practitioners who got exercise tended to be more active in helping patients to get exercise than those who did not (Brotons et al., 2005). Therefore, hospital staff could play a key role to get exercise for health promotion. As a result, this study aimed to examine how many hospital staff get exercise, what exercise pattern they do and what factors determined getting exercise.

**Theoretical framework**

This investigation used Social Cognitive Theory as a theoretical framework because it is a theory recommended for intervention of health behavior (Elder et al., 1999) and for changing exercise behavior (Norman and Velicer, 2003). The theory mentions the interactions of three components of an individual, i. e., his perception, his behavior and his environment (Bandura, 1986). In other words, individual perception and his environment influence his behavior.

Previous studies showed that people carried out physical activity or exercise because they liked it or they perceived its benefit (Downs and Hausenblas, 2004; Ingledew et al., 2004; Irwin et al., 2004). In contrast, some persons did not get exercise due to their thoughts preventing them from exercise (Schutzer and Graves, 2004). Such thoughts might be referred to as perceived barrier. Besides perceived benefit, whether people would get exercise or not depends on their self-efficacy to do (Wilbur et al., 2003; Ntoumani et al., 2005; Shin et al., 2005). Persons surrounding an individual could also influence his exercise (Voorhees and Young, 2003; Downs and Hausenblas, 2004; 2005). In addition, the availability and easy access to the place for exercise could enhance people to get exercise (Evenson et al., 2003; Mansfield et al., 2004; Zimring et al., 2005). Furthermore, social situation to stimulate exercise via a campaign or mass media could arouse people to participate in exercise too (Finlay and Faulkner, 2005; Rock et al., 2005).

Based on the theory and previous findings, this study developed variables associated with an individual to get exercise. Studied variables included 1) self-perception comprising with perceived benefit of exercise, perceived barrier of exercise, like to exercise and self-efficacy to exercise; and 2) environmental factors consisting of personal influence on exercise, place available and accessible for exercise and social situation about exercise. This study hypothesized that perceived benefit, perceived barrier, like, self-efficacy, person, place and situation were associated with exercise in hospital staff.

## MATERIALS AND METHODS

**Study design**

A cross-sectional study was undertaken in a random sample (n=320) selected from the staff list of a tertiary hospital in Northern Thailand in early 2005. A self-administered questionnaire contained demographic data, exercise pattern and items of studied variables. A cover letter informed the study objective and requested for cooperation.. Included in the letter was the definition of exercise, i.e., besides daily body movement, exercise is referred to as any physical activity using muscle and energy continually for a period of time in order to promote health, to enjoy life or to be sociable. The questionnaire with the letter was dropped off at the sample. A week later, all questionnaires were collected.

**Measurements**

***Independent variables***

Each independent variable was measured by subject responses on corresponding items. Responses were on a five-place scale, ranging from strongly agree (5) to strongly disagree (1). A total score of corresponding items was the score of that variable. The score of each item was not shown to the subject. The measurements were as follow:

Perceived benefit of exercise was measured by these three items: “Exercise could reduce stress”, “Exercise could build relation with other people”, and “Exercise could result in effective work”

Perceived barrier of exercise was determined by these four items: “It is not necessary to exercise because I am strong”, “It is not necessary to exercise because I always move my

body", "I have no time to exercise", and "Exercise takes time from doing other works"

Self-efficacy to exercise was measured by these three items: "I am afraid of injury from exercise", "I have no skill in exercise", and "I always feel tired after exercise"

Like to exercise was examined by these three items: "I like to exercise because I want to be a good model for other people", "I like to exercise because it gives me a good health", and "I like to exercise though I have done work all day"

Personal influence on exercise was determined by these four items: "Family members think that I should exercise", "Family members stimulate me to exercise", "My colleagues stimulate me to exercise", and "My boss promote me to exercise"

Place for exercise was examined by these three items: "There are several places for exercise", "There are places enough to exercise", and "I can easily go to places for exercise"

Situation about exercise was measured by these three items: "I get exercise according to the exercise campaign", "I get exercise because of an increase in exercise in my society", and "I get exercise because of my hospital invitation to exercise"

***Exercise pattern***

Exercise pattern of hospital staff was determined by the following items while exercise score was the sum score of the last two questions.

"Do you get exercise within this month?" Responses were getting exercise and not getting exercise. Subjects answering no further answered only question 2. Subject answering yes continued to answer question 3–6.

"What is the main reason making you not exercise?" Responses were lack of time, no skill in exercise, dislike to exercise and others

"What type of exercise do you prefer?" Responses were general exercise, such as walking, jogging; sport exercise, such as tennis, table tennis; and hard exercise, such as aerobic dancing.

"Before exercise, how long do you warm up your body?" Responses were no warm up, a few minutes and 5–10 minutes

"How often do you get exercise during this month?" Responses were rarely (5), 1–2 days/week (10), and 3–5 days/week (15)

"How long do you get exercise for each time?" Responses were less than 15 minutes (5), 15-30 minutes (10), and 30–60 minutes (15)

**Data analysis**

Descriptive statistics was used to describe the sample. Reliability and validity of instrument were based on coefficient alpha greater than 0.6, and factor loadings on a single factor respectively. Analysis of variance was used to determine the relation between sample demographics and their exercise. Pearson zero-order correlation coefficients of variables were determined. Multiple regression was used to analyze the association between studied variables and exercise. The level of significance was 0.05. All analyses were done on SPSS for Windows version 10.0.

## RESULTS

**Demographic samples**

The samples were 31 males (9.7%) and 289 females (90.3%). The mean age was 36.79, SD 8.51, with a range of 20-56 years. Based on mean age, there were two groups, i.e., the younger with age lower and the older with age higher. Most respondents (216, 67.5%) had bachelor's degree or higher. Professional staff (158, 49.4%) including physicians, dentists, pharmacists and nurses were about a half of hospital staff. More than a half of sample (183,

57.2%) indicated that they had diseases or health problems. Most respondents (266, 83.1%) reported that they got exercise during this month. These data are presented in Table 1.

**Table 1.** Demographic samples (n = 320).

| | | Frequency | Per cent |
|---|---|---|---|
| Sex | Male | 31 | 9.7 |
| | Female | 289 | 90.3 |
| Age | Younger | 151 | 47.2 |
| | Older | 169 | 52.8 |
| Education | Lower than bachelor's degree | 104 | 32.5 |
| | Bachelor's degree or higher | 216 | 67.5 |
| Work | Professional | 158 | 49.4 |
| | Non-professional | 162 | 50.6 |
| Health status | With disease | 183 | 57.2 |
| | Without disease | 137 | 42.8 |

**Exercise pattern**

Two-hundred-and-sixty-six respondents (83.12%) reported getting exercise and the rest (54, 16.88%) did not. The main reason (38, 70.37%) for not getting exercise was lack of time. Most respondents (164, 61.65%) liked walking, jogging and body movement. Before exercise, most respondents warmed up a few minutes (110, 41.35%) and 5–10 minutes (105, 39.47%). Among those who exercised, about a half (127, 47.74%) reported rare exercise, about one-fourth (72, 27.07%) got exercise 1-2 days/week and the rest (67, 25.19%) did 3–5 days/week. There were only 22 respondents (8.27%) reporting exercise frequency of 3–5 days/week and exercise duration of 30-60 minutes. These data are presented in Table 2.

**Table 2.** Exercise pattern.

| | Response | Frequency | Per cent |
|---|---|---|---|
| Exercise activity | Getting exercise | 266 | 83.12 |
| | Not getting exercise | 54 | 16.88 |
| Reason not to exercise | Lack of time | 38 | 70.37 |
| | No skill in exercise | 6 | 11.11 |
| | Dislike to exercise | 0 | 0.00 |
| | Others | 10 | 18.52 |
| Exercise type | General exercise | 164 | 61.65 |
| | Sport exercise | 41 | 15.41 |
| | Hard exercise | 61 | 22.93 |
| Warm up | No warm up | 51 | 19.17 |
| | A few minutes | 110 | 41.35 |
| | 5–10 minutes | 105 | 39.47 |
| Exercise frequency | Rarely | 127 | 47.74 |
| | 1–2 days/week | 72 | 27.07 |
| | 3–5 days/week | 67 | 25.19 |
| Exercise duration | Less than 15 minutes | 79 | 29.70 |
| | 15–30 minutes | 143 | 53.76 |
| | 30–60 minutes | 44 | 16.54 |
| Sufficient exercise | Frequency of 3-5 days/week and duration of 30–60 minutes | 22 | 8.27 |

**Relations between age, health status and exercise**

Except for age and health status, no relations between other demographics and exercise were found. The older group had more exercise than the younger group (p=0.01). Respondents who had no disease or health problem got more exercise than those who had (p=0.006). The relations are shown in Table 3.

**Table 3.** Relations between age, health status and exercise (n = 266).

| | Group | | p value |
|---|---|---|---|
| Age | Younger | Older | |
| Age range | 20–36 | 37–56 | |
| Age mean (SD) | 29.15 (4.72) | 43.91 (4.72) | |
| Frequency | 123 | 143 | |
| Exercise score (SD) | 17.15 (5.62) | 19.13 (6.56) | 0.010 |
| | | | |
| Health status | With disease | Without disease | |
| Frequency | 150 | 116 | |
| Exercise score (SD) | 17.03 (6.09) | 19.39 (6.19) | 0.006 |

**Association between situation, place, like, barrier and exercise**

A summary of variable measures is shown in Table 4. Each measure was reliable and valid. The correlation coefficients of variables are presented in Table 5. Multiple regression analysis of the association between seven studied variables and exercise yielded this model:

Exercise = 0.278 Like + .317 Situation + .297 Place - .203 Barrier

($R = 0.562$, $R^2 = 0.316$)

According to the regression coefficients, situation about exercise, place for exercise, like to exercise and barrier of exercise were important determinants for hospital staff to get exercise respectively. These four determinants explained 31.6% of variance in exercise.

**Table 4.** Variable measures.

| Variable | Item | Min | Max | Mean | SD | Alpha | Factor loading |
|---|---|---|---|---|---|---|---|
| Benefit | 3 | 6 | 15 | 11.48 | 1.99 | .74 | .860, .866,.702 |
| Barrier | 4 | 6 | 20 | 16.45 | 3.07 | .80 | .842, .833, .718, .796 |
| Self-efficacy | 3 | 6 | 15 | 12.28 | 2.04 | .65 | .770, .714, .763 |
| Like | 3 | 5 | 15 | 10.76 | 2.44 | .82 | .866, .876, .846 |
| Person | 4 | 4 | 20 | 12.50 | 2.91 | .77 | .837, .880, .701, .655 |
| Place | 3 | 3 | 15 | 9.99 | 2.46 | .69 | .742, .810, .810 |
| Situation | 3 | 3 | 15 | 8.01 | 2.72 | .81 | .851, .892, .816 |
| Exercise | 2 | 10 | 30 | 18.21 | 6.21 | .81 | .934, .900 |

**Table 5.** Correlation coefficients of variables.

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1 Benefit | | | | | | | | |
| 2 Barrier | .061 | | | | | | | |
| 3 Self-efficacy | .179* | .442* | | | | | | |
| 4 Like | .551* | .336* | .270* | | | | | |
| 5 Person | .289* | .211* | .089 | .453* | | | | |
| 6 Place | .486* | .114 | .188* | .523* | .531* | | | |
| 7 Situation | .139* | .004 | .123* | .293* | .394* | .417* | | |
| 8 Exercise | .179* | .319* | .191* | .416* | .179* | .330* | .030 | |

* p value<0.05

## DISCUSSION

This study investigated exercise and its correlates in hospital staff. Exercise is referred to as the continual physical movement of the body in a specific condition. The current suggestion level of exercise that could provide health benefit included thirty minutes of at least moderately-intense physical activity on five, but preferably, all days of the week (Rock et al., 2005). Though about 83% of this hospital staff reported exercising, only 8.3% of this group got exercise sufficiently according to the suggestion. This finding indicated that necessary interventions to improve insufficient exercise were needed. Increasing sufficient exercise in hospital staff could have a further impact on the health promotion of patients, their relatives and people in the community.

Age was found to be a factor associated with exercise because there was a difference in getting exercise between the older and the younger group. The older, mean age of 43 years, reporting higher exercise might perceive that their health gradually decreased when years passed by, and wanted to keep it strong as long as possible. This perception could lead to getting more exercise. However, there was a report mentioning the decreased trends in exercise among people with increasing age, especially adults aged 65 or higher (Schutzer and Graves, 2004). The reason why the younger group got less exercise than the older one might be due to their fitter and stronger health. Therefore, they felt that it was not necessary to exercise regularly. Owing to the exercise benefit to everyone, it is important to make hospital staff, both the older and the younger, to adopt and maintain exercise as an essential activity in daily life.

Health condition was also found to be a factor related to exercise. In this study, health condition meant the absence or presence of diseases or health problems. The hospital staff with no disease got more exercise than those with disease. It seemed that diseases or health problems prevented the staff from getting exercise. The staff with disease might think that exercise was harmful to their body, so they did less exercise. In fact, some diseases such as joint pain might limit exercise but several diseases, such as hypertension, diabetes mellitus and obesity need exercise to reduce its risk because exercise or physical activity could influence physiologic function positively (Morey and Sullivan, 2003). For safety, individuals who are not certain about exercise for health should consult physician about type and pattern of exercise suitable for them before starting. A pre-exercise screening via questionnaire should be conducted in order that individuals, especially those with disease, could be confirmed to get appropriate exercise (Humphrey and Lakomy, 2003).

This investigation used Social Cognitive Theory as a theoretical framework to determine the influence of self-perception and environmental factor on exercise in hospital staff.

The results supported the theory that both factors had influences on exercise. This finding could confirm the use of this theory in changing exercise behavior (Norman and Velicer, 2003). Based on the regression coefficients, environmental factors, i.e., situation and place, had more influences than self-perception, i.e., like and barrier. Situation about exercise and place for exercise were the main determinants associated with exercise. As a result, these determinants should be a prior concern to increase the percentage of hospital staff in getting sufficient exercise. Exercise campaign should be continuously conducted to convince everyone. Regular exercise schedule should be informed. To initiate staff getting exercise, it is necessary to increase the number of place convenient to access. Besides situation about exercise and place for exercise, to establish like to exercise could also enhance getting more exercise. Exercise that could make staff enjoyable would result in like to exercise. On the other hand, perceived barrier of exercise should be decreased. Hospital staff thought that they were healthy and usually moved their body in daily life. These perceptions were barriers of exercise. Health should be maintained and promoted not only when ill but also when healthy. Sufficient exercise could provide more health benefit than ordinary daily body movement. Therefore, making staff have a correct understanding of health and exercise is essential because it could reduce barrier of exercise.

## CONCLUSION

Exercise is an activity used to promote people's health. Hospital staff responsible for health promotion are expected to play a key role in getting exercise for themselves, patients, patients' relatives and people in the community. However, they are still less active in exercise. It is necessary to improve exercise in hospital staff. There are both positive and negative factors associated with exercise. Strengthening positive factors and weakening negative factors could lead to an increase in getting sufficient exercise. Changing exercise behavior in hospital staff would give an important impact on health promotion for people.

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