

# Predictive Factors of Exercise Behaviors of Junior High School Students in Chonburi Province

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**Abstract**—Exercise has been regarded as a necessary and important aspect to enhance physical performance and psychology health. Body weight statistics of students in junior high school students in Chonburi Province beyond a standard risk of obesity. Promoting exercise among Junior high school students in Chonburi Province, essential knowledge concerning factors influencing exercise is needed. Therefore, this study aims to (1) determine the levels of perceived exercise behavior, exercise behavior in the past, perceived barriers to exercise, perceived benefits of exercise, perceived self-efficacy to exercise, feelings associated with exercise behavior, influence of the family to exercise, influence of friends to exercise, and the perceived influence of the environment on exercise. (2) examine the predicting ability of each of the above factors while including personal factors (sex, educational level) for exercise behavior. Pender's Health Promotion Model was used as a guide for the study. Sample included 652 students in junior high schools, Chonburi Province. The samples were selected by Multi-Stage Random Sampling. Data Collection has been done by using self-administered questionnaires. Data were analyzed using descriptive statistics, Pearson's product moment correlation coefficient, Eta, and stepwise multiple regression analysis. The research results showed that: 1. Perceived benefits of exercise, influence of teacher, influence of environmental, feelings associated with exercise behavior were at a high level. Influence of the family to exercise, exercise behavior, exercise behavior in the past, perceived self-efficacy to exercise and influence of friends were at a moderate level. Perceived barriers to exercise were at a low level. 2. Exercise behavior was positively significant related to perceived benefits of exercise, influence of the family to exercise, exercise behavior in the past, perceived self-efficacy to exercise, influence of friends, influence of teacher, influence of environmental and feelings associated with exercise behavior ( $p < .01$ , respectively) and was negatively significant related to educational level and perceived barriers to exercise ( $p < .01$ , respectively). Exercise behavior was significant related to sex (Eta = 0.243,  $p = .000$ ). 3. Exercise behavior in the past, influence of the family to exercise significantly contributed 60.10 percent of the variance to the prediction of exercise behavior in male students ( $p < .01$ ). Exercise behavior in the past, perceived self-efficacy to exercise, perceived barriers to exercise, and educational level significantly contributed 52.60 percent of the variance to the prediction of exercise behavior in female students ( $p < .01$ ).

**Keywords**—Predictive factors, exercise behaviors, junior high school.

## I. INTRODUCTION

EXERCISE has been regarded as a necessary and important aspect to enhance physical performance, readying to live in a society well and efficiently. Nowadays, people have inappropriate behavior such as lack of exercise, smoking, alcohol drinking and fast-food consumption that are cause-

related to diseases such as heart disease, hypertension and diabetes mellitus. The study was found that the teenagers have lower rates of physical activity [1]. Therefore, the sport scientist have to find the information for motivate children to teenagers developing the exercise habit until adulthood for the body get the full benefit of the exercise [2]-[4]. If we can develop the children love the exercise, it will affect to exercise in adults as possible [5]. The results of the survey exercise behavior of the population of Thailand aged 11 years old and over in 2003, 2004 and 2007 was found that people tend to exercise slight increasing from 29% to 29.1% and 29.6% respectively [6]. And from the static can be known that children, young men and young women have the habit of exercise is low [7]. Nowadays, elementary and secondary school - aged population more than 5 million people are obesity. The elementary school students in urban overweight up to 15.4% and the students in demonstration school - university are obesity high percentage of 25.9 to 31.5 such as the school under the Private Education Commission, percentage of obese children showed 25.7 to 28.1 Cultivating good values about strengthening exercise behavior of youth to be in the correct direction. It should start from school - age. And Junior high school students should change from exercise for fun to exercise for health [8]. Therefore, they should be cultivated about the habit of exercise for good exercise behavior for would be good to make a living and take them to the adults. From the weight static of students in Junior high school in Chonburi province exceeds the benchmark 3,226 people (11.21%) from 28,778 students in Junior high school have been estimated weight, which is amount too much and risk to be obesity [9]. Thus, researcher is interested in studying the factors that can predict exercise behavior of students in Junior high school in Chonburi. This will be beneficial to all parties involved for planning and supporting the youth have exercise behavior correctly and develop physical fitness to be healthy.

## II. EXPECTED BENEFITS

1. The benefits from research are the information that can be used for planning. The administrators, teachers and parents can use it for provide, support and develop the physical activities for the students.
2. The results of this study was showed that the factors relate to exercise behavior and people who involve should aware the importance of the factors for lend the activities of teaching students understand and have correct behavior.

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### III. RESEARCH METHODOLOGY

This study is a survey research. The sample is 652 students in Junior high school of the first semester in 2012 in Chonburi province belong to the Secondary Educational Service Area Office 18 with Multi - Stage Random Sampling. After the research has been approved by the ethical review committee for research in human subjects of Burapha University, the researchers collected data and locations in Chonburi province including Chonburi Sukkhabot School, Panthong School, Singsamut School, Phothisamphanphitthayakhom School, Phanatpittayakarn School and Thungsuklapittaya "Krungthai Anukroh" School. The sample who know the purpose of research, cooperate to reply the questionnaire that is developed by researchers. And the answer is the rating scale 4 levels, divided into 3 steps; step 1 - General Information including sex and educational level, step 2 - Exercise behavior has reliability .81 and step 3- The factors influencing exercise, the reliability of all questionnaire  $\alpha$  .92 and in step 3 divided into 9 parts; part 1 - Exercise behavior in the past  $\alpha$  .77 part 2 - Perceived barriers to exercise  $\alpha$  .70 part 3 - Perceived benefits of exercise  $\alpha$  .83 part 4 - Perceived self-efficacy to exercise  $\alpha$  .75 part 5 - Feelings associated with exercise behavior  $\alpha$  .53 part 6 - Influence of the family to exercise  $\alpha$  .89 part 7 - Influence of the teacher to exercise  $\alpha$  .83 part 8 - Influence of the friends to exercise  $\alpha$  .83 part 9 - Influence of environmental  $\alpha$  .70 and correlation analyzed with Pearson's Product Moment Correlation Coefficient and analyzed between sex and educational level and exercise behavior with Eta statistics analysis analyzed Nominal 1 variable and 1 quantitative variable and analyzed the factors predicting of exercise behavior by the regression equation separate between male and female, using Stepwise Multiple Regression Analysis and used at a significant level .01 separate the prevision in the equation and used at a significant level .05 screen out the prevision in the equation [10].

### IV. RESULTS

The samples used in the study were 652 students who were studied in Junior high school. This research were collected data from the sample of Junior high school such as Phothisamphanphitthayakhom School 118 students (18.1%), Singsamut School 90 students (13.8%), Panthong School 118 students (18.1%), Phanatpittayakarn School 117 students (17.9%), Chonburi Sukkhabot School 93 students (14.3%), and Thungsuklapittaya "Krungthai Anukroh" School 116 students (17.8%). There were 321 males (49.2 %), and 331 females (50.8 %).

There were aged between 13-14 years old, there were 305 students (46.8%), aged between 14-15 years old, there were 237 students (36.3%), aged between 15-16 years old, there were 109 students (16.7%), and aged between 16-17 years old, there was 1 student (0.20%).

The samples were studied in grade 7, there were 219 students (33.6%), grade 8, there were 222 students (34%), and grade 9, there were 211 students (32.4%). The research was

analyzed with Predictive factors of exercise behaviors and summarized as follow:

1. The mean score descending order as follows. Perceived benefits of exercise (Mean = 32.67, S.D. = 4.56, Percentage of Mean 75.57), influence of teacher (Mean = 15.86, S.D. = 3.07, Percentage of Mean 72.40), influence of environmental (Mean = 14.65, S.D. = 2.95, Percentage of Mean 64.33), feelings associated with exercise behavior (Mean = 11.06, S.D. = 2.25, Percentage of Mean 58.83) were at a high level. Influence of the family to exercise (Mean = 28.79, S.D. = 7.18, Percentage of Mean 53.91), exercise behavior (Mean = 26.06, S.D. = 5.51, Percentage of Mean 53.53), exercise behavior in the past (Mean = 20.75, S.D. = 4.37, Percentage of Mean 53.13), perceived self-efficacy to exercise (Mean = 18.04, S.D. = 3.92, Percentage of Mean 52.57), influence of friends (Mean = 18.02, S.D. = 4.66, Percentage of Mean 52.48) were at a moderate level. Perceived barriers to exercise (Mean = 8.51, S.D. = 2.48, Percentage of Mean 23.40) were at a low level, as follows on Table I.

TABLE I  
MEAN, S.D., PERCENTAGE OF MEAN OF PREDICTIVE FACTORS OF EXERCISE BEHAVIORS

| Predictive factors of exercise behaviors   | Min score | Max score | mean  | S.D. | % of mean |
|--|-----------|-----------|-------|------|-----------|
| perceived benefits of exercise             | 14        | 40        | 32.67 | 4.56 | 75.57     |
| influence of the family to exercise        | 11        | 44        | 28.79 | 7.18 | 53.91     |
| exercise behavior                          | 10        | 40        | 26.06 | 5.51 | 53.53     |
| exercise behavior in the past              | 9         | 32        | 20.75 | 4.37 | 53.13     |
| perceived self-efficacy to exercise        | 7         | 28        | 18.04 | 3.92 | 52.57     |
| influence of friends                       | 7         | 28        | 18.02 | 4.66 | 52.48     |
| influence of teacher                       | 5         | 20        | 15.86 | 3.07 | 72.40     |
| influence of environmental                 | 5         | 20        | 14.65 | 2.95 | 64.33     |
| feelings associated with exercise behavior | 4         | 16        | 11.06 | 2.25 | 58.83     |
| perceived barriers to exercise             | 5         | 19        | 8.51  | 2.48 | 23.40     |

2. The relationship of predictive factors of exercise behaviors and exercise behaviors as follow Table II.
3. Examine the predicting ability of factors while including personal factors (sex, educational level) for exercise behavior.

TABLE II  
CORRELATION BETWEEN THE FACTORS THAT PREDICT EXERCISE BEHAVIOR AND EXERCISE BEHAVIOR

| Predictive factors of exercise behaviors   | r        | p    |
|--|----------|------|
| educational level                          | -0.120** | .001 |
| perceived benefits of exercise             | 0.373**  | .000 |
| influence of the family                    | 0.414**  | .000 |
| exercise behavior in the past              | 0.745**  | .000 |
| perceived self-efficacy to exercise        | 0.550**  | .000 |
| influence of friends                       | 0.448**  | .000 |
| influence of teacher                       | 0.198**  | .000 |
| influence of environmental                 | 0.317**  | .000 |
| feelings associated with exercise behavior | 0.297**  | .000 |
| perceived barriers to exercise             | -0.226** | .000 |

TABLE III  
CORRELATION AND SIZE RELATIONSHIPS OF PREDICTORS OF REGRESSION IN MALES (A)

| Model                               | Unstandardized Coefficients |            | t       | Sig. | Partial Correlations (r) | Standardized Coefficients<br>Beta |
|-------------------------------------|-----------------------------|------------|---------|------|--------------------------|-----------------------------------|
|                                     | B                           | Std. Error |         |      |                          |                                   |
| Constant                            | 4.71                        | 1.07       | 4.40**  | .000 |                          |                                   |
| exercise behavior in the past       | 0.89                        | 0.05       | 16.40** | .000 | 0.68                     | 0.69                              |
| influence of the family to exercise | 0.12                        | 0.03       | 3.45**  | .001 | 0.19                     | 0.15                              |

Dependent Variable: Exercise behavior of male; Predictors: (Constant), Exercise behavior in the past and Influence of the family to exercise; Model: F= 241.85, F Change = 11.91, p = .000, R = 0.78, R<sup>2</sup> = 0.60, adjusted R<sup>2</sup> = 0.60, Std. Error = 3.65, \*\* p < .01

TABLE IV  
CORRELATION AND SIZE RELATIONSHIPS OF PREDICTORS OF REGRESSION IN FEMALES (A)

| Model                         | Unstandardized Coefficients |            | t       | Sig. | Partial Correlations (r) | Standardized Coefficients<br>Beta |
|-------------------------------|-----------------------------|------------|---------|------|--------------------------|-----------------------------------|
|                               | B                           | Std. Error |         |      |                          |                                   |
| Constant                      | 10.90                       | 1.58       | 6.92**  | .000 |                          |                                   |
| exercise behavior in the past | 0.70                        | .053       | 13.21** | .000 | .59                      | 0.57                              |
| perceived self-efficacy       | 0.22                        | 0.06       | 3.64**  | .000 | 0.19                     | 0.16                              |
| perceived barriers            | -0.26                       | 0.08       | -3.37** | .001 | -0.18                    | 0.13-                             |
| education level               | -0.71                       | 0.24       | -3.03** | .003 | -0.17                    | 0.12-                             |

Dependent Variable: Exercise behavior of female; Predictors: (Constant), exercise behavior in the past, perceived self-efficacy, perceived barriers and education level; Model: F= 92.67, F Change = 9.18, p = .000, R = 0.73, R<sup>2</sup> = 0.53, adjusted R<sup>2</sup> = 0.55, Std. Error = 3.38; \*\* p < .01

Analysis of variance for regression testing and researcher analyzed separately between male and female.

*Male:* Analysis of variance for regression testing in male was found that exercise behavior in the past and influence of the family to exercise, predicted of exercise behavior in male students with a statistically significant level .01 (p < .01).

From Table III, Relationship of exercise behavior in the past and influence of the family to exercise was controlled by the interference of other factor in the equation. The r = 0.68 and r = 0.19, have the power to predict 60.10% (adjusted R<sup>2</sup> = 0.60), the coefficient of multiple correlation (R) equals 0.78, Standard Error of Estimate equals 3.65 and constant equation of prediction in raw score equals 4.71.

The analysis result of the factors that influence exercise behavior in male students was found that the variables of exercise behavior in the past and influence of the family to exercise, affected the exercise behavior of male students with a statistically significant, (p < .01), the two variables can explain exercise behavior in male students 60.10%, sorted the importance of each variable standardized regression coefficient (Beta) is exercise behavior in the past (0.69) and influence of the family to exercise (0.15), equation of prediction in raw score as follows:

Exercise behavior of male = 4.71 + 0.89 (exercise behavior in the past) + 0.12 (influence of the family to exercise).

*Female:* Analysis of variance for regression testing in female was found that there are 4 independent variables. They are exercise behavior in the past, perceived self-efficacy, perceived barriers and education level, predicted of exercise behavior in female students with a statistically significant level .01 (p < .01).

From Table IV, regression equation analysis of the female, all predictors have the power to predict 52.60% (adjusted R<sup>2</sup> = 0.53), the coefficient of multiple correlation (R) equals 0.73, Standard Error of Estimate equals 3.38 and constant equation of prediction in raw score equals 10.90. There are 4 factors;

they are exercise behavior in the past, perceived self-efficacy, perceived barriers and education level. When calculating the correlation of individual predictors to factor of exercise behavior correctly and control the interference of other predictors in the equation. The r = .59, .19, -.18 and -.17.

The analysis result of the factors that influence exercise behavior in female students was found that the variables of exercise behavior in the past, perceived self-efficacy, perceived barriers and education level, affected the exercise behavior of female students with a statistically significant, (p < .01), the four variables can explain exercise behavior in female students 52.60%, sorted the importance of each variable standardized regression coefficient (Beta) is exercise behavior in the past (0.57), perceived self-efficacy (0.16), perceived barriers (-0.13) and education level (-0.12), equation of prediction in raw score as follows:

Exercise behavior of female = 10.90 + 0.70 (exercise behavior in the past) + 0.22 (perceived self-efficacy) - 0.26 (perceived barriers) - 0.71 (education level).

## V. DISCUSSION

Influence of friends, because early adolescence changes the body, mind and thought. Admission to the secondary is during many changes such as the new environment can affect the social development of children. In general, most children are still friends with similar tastes or people who like each other. Children's society is friends, will hold from friends and people in the ideal, need to be a recognition from friends and society around them and exchange the experiences with each other in group. Friends have a strong influence on attitudes interests and adolescents behavior. So, the relation between exercise behaviors correctly correlated positively with the influence of friends to exercise of Nursing College Central, found that the perceived influence of friends to exercise has positive correlation with statistically significant [11].

Influence of the family to exercise, from Psychosocial theories of Ericsson [12], described the personality change at any time from birth to death. It's depending on the person's social involvement. Because society surrounds person, has an importance role to develop the personality of adaptation. Person will try to adapt the demands of the society which is the owner according to social determine the different ages such as a child will be taught what need to do for live with others. Therefore, the development of teen's personality born from experience in the family with industry and inferiority (at the age of 6 to 11). Factor of influence to children is influence of family. If the family acts as exemplified in the exercise and encourages children to exercise, children will have personality of industrious and practice activities regularly. And the influence of teacher affected to the exercise behavior of children. Teaching activities can encourage the exercise, make the children love and see the benefit of exercise and receive to a pattern of activity in their live, affected to practice sustainability. Identity and role confusion (at the age of 12 to 17), teenagers can be developed the knowledge of who he is, what can be done or not. The samples are teenager, will start to improve personality, imitate their praise and like to do something new and different. Teachers and parents should work together to help and guide closely, to be exemplary of diary life and encouraged to exercise behavior correctly. When children exercise and get feedback, which is the main source of self - efficacy or their skills. It is likely to repeat the behavior even more. And it can make children want to develop their efficacy or skills increased and continue to do activities. According to the study of factors affecting exercise behavior of education officer in Ubon Ratchathani province [13]. In 5 institution Education, 348 people found the biosocial factor including gender, age and length, the input factor including knowledge about exercise, attitudes about exercise and perceived benefits of exercise, Contributing factor including support from family, support from friends and support from the educational institutions. It's correlated with exercise behavior in linear and can explain the variance of exercise behavior were 32% and it was 5 good variables predicted exercise behavior such as support from family, place for exercise, male, attitudes about exercise and support from friends, can explain the variance of exercise behavior 31.50%.

Perceived benefits of exercise factor were associated with exercise behavior because person, who has any behavior, has to consider the benefits or results of action [14]. The study in an overweight female group, perceived benefits of exercise factor and perceived barriers to exercise factor, correlate with a statistically significant of exercise behavior [15]. Perceived benefits of exercise and perceived barriers to exercise have influence to exercise of nursing students. The study was found that students perceived benefits of exercise can help them to sleep and exercise can help them keep muscles strong and flexible [16]. The study about psychological affected to exercise, in 719 Japanese workers [17] found that educating about health by professional can help to confidence to exercise and the study of exercise in female college students in China

[18] found that perceived benefits of exercise has a positive correlation with exercise behaviors.

Influence of environment factor, regarding the perceived influence of environment to exercise of the students found that it's positive correlated [19], that means students aware about the environment to exercise in school, home and community housing for exercise easily, corresponding the study of important factor to exercise of women [20] and it was found that facilitate exercise is an important factor, can affect to exercise of women such as equipment to exercise, cost for exercise and clothes to wear during exercise.

Perceived self-efficacy, person who can perceive self-efficacy, will begin to care themselves and try to search knowledge about prevention control and stop behaviors that are harmful to health [21]. This is consistent with the study of the relationship of self-efficacy to exercise, emotional state and perception of body changes in women who are overweight with exercise and nutrition program for six months [22], the samples believe to have a positive relation with exercise. The study predict intention in physical activity and behavior of 645 children (at the age 11 to 13) in New Zealand [23] and 67 children in Canada was found that increasing confidence, result to children have more physical activity.

Exercise behavior in the past factor, had a positive correlation with exercise behavior. Prior related behavior are both positive and negative experiences that people practiced, can affect mood or thought about exercise. If person has positive experience, person has that behavior again. The best predictor is frequency of the behavior in the past result to behavior in the past to promoting health behavior at the present, may currently about the character, can lead to automatic behavior. The behavior occurs each time will increase the strength of character to add more. If the behavior is repeated, the behavior in the past affects the exercise directly and the exercise of self-efficacy indirectly [24]-[26].

Exercise behavior was negatively significant related to educational level and perceived barriers to exercise ( $r = -0.120$  and  $-0.226$ ,  $p < .01$ , respectively). Exercise behavior was significant related to sex ( $\text{Eta} = 0.243$ ,  $p = .000$ ) because higher-level class, students are learning and doing something more than exercise. Differences in learning activities of each class in Junior high school, students will be in the range of adjustment and various sports activities in addition to class. The school offers grade 7 is studying intensive to prepare for academic matter. So, the time to take in the exercise is reduced, make the relationship is negative. In this study can explain other activities at the school make student can't exercise as they want. So, the relationship is negative. Educating factor predictive relationship and exercise behavior of 3<sup>rd</sup> grade and the school expand educational opportunities [27] was found that influence of friend, influence of environment, influence of teachers, influence of family, perceived benefits, personal factor (female) and grade 9, there is a positive correlation with the variables of exercise behavior and variables such as personal factor (male) and grade 8 are a positive correlation with exercise behavior.



Exercise behavior correlated negatively with perceived barriers with a statistically significant level .01, although most students have activities about learning. However, students can exercise in the environment and the place and equipment are ready to use every time. It can make students perceived barriers to exercise at low level and still have behavior as they want. It affected the relationship is negative, corresponding to study the exercise behavior of college students in Institute of Physical Education [28] was found that perceived barriers to exercise has a negative correlation with exercise behavior of students. The barriers stimulate the motivation to avoid the behavior. So, if they recognize that there are a lot of obstacles and ready to participate less. The desired behavior will not occur [29]. Studying influence exercise behavior of high school students [30] was found that the perceived barriers to exercise, there is a negative correlation with exercise behavior. The perceived barriers to exercise, the perceived self-efficacy to exercise and social support for exercise predict exercise behavior 40.60% ( $p < .01$ ). Studying factors affected the exercise of college students at Rajamangala University of Technology Phra Nakhon [31]: the factors that could predict the behavior of exercise, including perceived self-efficacy, perceived barriers to exercise, sex, educational and social support for exercise predict exercise behavior 23.40%.

Exercise behavior has correlative with sex factor with a statistically significant level .01 because exercise and some sports have some limitations in sexuality. Each gender has the aptitude to exercise or play sports are not equal or have the potential to exercise not the same in each activity such as man may Yoga isn't as good as woman due to limitations in the flexibility of the joints and bones but man can run faster than woman [32]. Exercise for Health, Department of Health Division (2004) study dynamic exertion / exercise behavior, dietary habits and habit of walking up the stairs instead of the elevator [33] found that sex, marital status, education level and age have correlation with dynamic exertion/exercise behavior.

Predictive exercise behavior of male students equation as follows: Exercise behavior of male =  $4.71 + 0.89$  (exercise behavior in the past) +  $0.12$  (influence of the family to exercise).

Described that when know the score of exercise behavior in the past and the influence of the family of a male student, when determine the score of correct exercise behavior in a male students can find from the beginning of 4.712 plus 0.885 of the score of exercise behavior in the past, plus 0.117 of the score of influence of the family. Concluded that exercise behavior in the past and influence of the family of a male student can predict exercise behavior was 60.10% with a statistically significant level .01.

Predictive exercise behavior of female students' equation as:

Exercise behavior of female =  $10.90 + 0.70$  (exercise behavior in the past) +  $0.22$  (perceived self-efficacy) -  $0.26$  (perceived barriers) -  $0.71$  (education level). Described that when know the score of exercise behavior in the past, perceived self-efficacy, perceived barriers and education level of a female student. When determine the score of exercise behavior in a female

students can find from the beginning of 10.897 plus 0.704 of the score of exercise behavior in the past and plus 0.216 of the score of perceived self-efficacy minus 0.264 of the score of perceived barriers and minus 0.714 of the education level. Concluded that exercise behavior in the past, perceived self-efficacy, perceived barriers and education level can predict exercise behavior was 52.60% with a statistically significant level .01.

## VI. SUGGESTIONS

Should be educated to the exercise of students of each school for manage exercise program or activities to according the needs of students. The school should provide a program of exercise that results in a concrete physical fitness of students and has the evaluation for encourage students to exercise behaviors that are consistent and see clearly.

## ACKNOWLEDGMENT

This work was supported by Faculty of Sport Science Burapha University, 2012.

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