Predictors of Physical Activity Amongst Women Students of Teacher Education for Primary Education at Indonesia University of Education, Sumedang Campus

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Abstract. Physical activity (PA) interventions are needed at all age groups (USDHHS, 2000), while women students in Indonesia are still continue to exhibit a poor level of PA which calls for more effective PA interventions. This study is aimed to examine some predictors of PA amongst women students of Teacher Education for Primary Education (TEFPE), including self-control on diet (SC-D), health related fitness knowledge (HRFK), and free time motivation (FTM). This study applied descriptive correlation and regression analysis, and a cross-sectional approach, and participants consist of a random sample of 206 women students of TEFPE. Data were obtained by using SC-D scale (Grassick et al), FTM scale (Baldwin & Caldwell, 2001), HRFK test (Smart fit), and International Physical Activity Questionnaire-Short (IPAQ-Short) self-report, in which those instruments have been adapted to Indonesian version. The coefficient reliability (Cronbach-alpha) of SC-D scale and FTM scale is fairly high, .80 and .84 respectively, while HRFK test has been validated, and belongs to content validity, while its reliability is high enough (.81). The whole HRFK’s test items (40 items) showed fairly good of its discrimination index. This study revealed that the largest percentage of woman students belongs to a low level of physical activity (vigorous = 13.1%; moderate= 40.80%; light = 46.10%). A multiple correlation among SC-D, HRFK, FTM, and PA was fairly high and significant (R= .858< .05). A multiple regression analysis showed that HRFK (b3= 63.697) is far more powerful than SC-D (b1=25.086), and FTM (b2= 7.055) to predict PA. Students’ motivation to engage in PA during free time tend to be generated by extrinsic rather than intrinsic motivation. This study suggest that the acquisition of HRFK is a foundation to promote PA, in order to maintain “a carry over effect” to exhibit healthy and active life style amongst students. But free time motivation should be sustained as “driving force” to exhibit healthy behaviour across a life span.

1. Introduction
Health problems associated with obesity and physical inactivity are widely acknowledged and over the past 30 years have become a serious public health concern.[1] University students have also been identified as a unique group for targeted interventions. It was due to the reasons that it was too often students make decisions about their lives and behaviors in campus. Indonesian students are still exhibit a poor habit of inactive style of life.[2] The decrease of physical activity (PA) simply because of the lack of “carry over effect” of physical education program since primary education until higher education. Aside campus infrastructures related to the lack sport facilities and public space has
also play a dominant role to affect sport or movement culture in campus.[3] Therefore, Suherman called for the reviving of sport for all in Indonesia, or Setiawan insisted the need for curriculum reformation in Indonesia to respond the promise to achieve physical education programs’ objective to exhibit a healthy and active style of life across a life span.[4,5] The important of health related fitness knowledge (HRFK) play a dominant role to promote PA, based on theory of planned behavior (TPB).[6] The correlation between HRFK and PA is low and insignificant. He develops and tested a model, in which FTM play as mediator of HRFK to PA.[7]

Nevertheless, self-control (SC) should be taken into account to examine the predictor of PA, because SC related to will power, to control impulse, or to sustain determination.[8] Lack of will power to sustain a healthy and active style of life has close relationship with the love of self-control. In fact there is a lack of understanding about the role of SC, HRFK, and FTM as predictors of PA in higher education campus in Indonesia, so the knowledge related to those predictors will fill the gap between theory and PA behavior.

2. Method

2.1. Participants

Undergraduate students (n = 206) from three level undergraduate classes (2013, 2014, 2015) of Teacher Education for Primary Education at Indonesia University of Education (TEPE - IUE) Sumedang campus participated in the study. Participants consist of women students of non-physical education program, and the parity was Sundaneses, while the mean age of participants was 20.20 (SD = 2.5). Those participants were reflective of the student body and their characteristics at TEPE-IUE Sumedang Campus.

2.2. Measures

Student SC-D, HRF knowledge, FTM, and PA were measured by self reported procedure in order to gain data as needed by the objective of the study. SC-D scale, FTM scale, HRF knowledge test, and International Physical Activity Questionnaire (IPAQ-Short questions) were distributed one by one to participants as a paper-pencil survey. Author has also explained the purpose of survey including how to answer questions. Participants were divided into four groups, and survey was completed in one day.

2.2.1. Self-Control on Diet. SC-D was measure by a SC-D scale which has been adapted from Grassick et al. (1993). This scale contained 24 items related to attitude which was presented in Likert scale structure including 5 response pattern as an order from very agree until very do not agree. All items were presented in negative statement so scoring codification was 1, 2, 3, 4, and 5 as a continuous scale. SC-D scale was constructed to measure the attitude toward diet, including 5 sub-components: (1) impulsivity, (2) simple task, (3) risk, (4) self-centeredness, and (5) temper. Reliability of SC-D (Cronbach alpha) was high and significant (.827 < .05)

HRF knowledge. Student HRF knowledge was measured by using a HRF knowledge test which have been adapted from HRF knowledge that developed by Keating et al. (2009). Author developed a new HRF knowledge, including 6 content domains: (1) basic HRF and PA concepts, (2) basic physiological responses to PA, (3) basic nutrition concepts, (4) HRF and PA assessment, (5) individualized PA prescription, nutrition assessment, and (6) safety and injury prevention. Author have examined the content of HRF textbooks published for students of TEPE, and a panel of experts (n = 3) in the field of physical education and fitness were asked to assess the content of those domains in order to ensure content validity. They were also asked to weigh the appropriateness of the each domain using 5-point Likert scale with 5 and 1 for
the most and less important content respectively. All 6 domains were recognized important by assessor, so the next step as to develop 40 items of multiple choice which reflected each domain. The participants of this study need for 30 minutes to complete HRF knowledge test. It was safe to conclude the HRF knowledge test has met the principle of psychometric, particularly to meet content validity requirement. The reliability of HRF knowledge test was fairly high (\(.84 < .05\)) while index discrimination of test items ranging from 0.25 until 0.80.

2.2.2 Free Time Motivation (FTM). FTM scale which was used in this study was a scale adapted from Free Time Motivation Scale (FTMS) that developed by Baldwin and Caldwell (2003). FTMS was developed according to the structure Likert scale ranging from 5 to 1 respectively as continuous score. FTMS contained sub-components motivation, extrinsic motivation, introjected motivation, identified motivation, and intrinsic motivation. Reliability of FTMS, as a whole, is fairly high (\(.854 < .05\)).

2.2.4 PA measures. PA data were measured by IPAQ-Short developed by panel of expert and launched in Genève in 2002. This questionnaire has been validated in 14 centre in 1 countries, and its validity is fairly high (\(r = .30\)). Authors have translated this instrument from English to Indonesian language, similar with the procedure which has been adopted by researcher in Arab Saudi, Taiwan, Cina, and Swedia. Students were asked to specify the PA event which they usually engage during the last 7 days, following the sequence of questions, starting from vigorous (V), Moderate (M), and light (walking). The intensity of PA reflected vigorous intensity, for example, is lifting heavy weight, engaging aerobic exercise, and riding bicycle with high speed. Students were asked to report frequency of PA event per week, lasting 20 minutes or longer per session per day.

A common method to calculate the total PA event is to convert various intensity (vigorous, moderate, and light/walking) into metabolic equivalent (MET). MET-minutes of walking/week = 3.3*minutes of walking*walk day per week. MET-minutes of moderate/week = 4.0* minutes of PA moderate* day of moderate intensity. MET-minutes of vigorous week = 8.0* minutes flavorous intensity* day of vigorous intensity.

To calculate the total PA intensity for 30 minutes episode, and frequency of 5 per week: Walking) = 3.3 MET: 3.3*30*5 = 495 Met-minutes/week. Moderate intensity = 4.0 MET: 4.0*30*5 = 600 MET-minutes/week
Vigorous intensity = 8.0 MET: 8.0*30*5 = 1,200 MET-minutes/week
Total = 2,295 MET-minutes/week
Therefore the total score
Total MET-minute/week = (Walk METs*min*days) + (Mod METs*min*days) + (Vig METs min*days).

3. Data Analyses
Data screening was conducted before analyses were performed. In total, there were 5% of survey were eliminated from the data, particularly from HRF knowledge test and IPAQ due to excessive missing data. There were statistical assumptions for ANOVA (i.e. Univariate normality, and homogeneity of variances) to explore difference among motivation components, and Tukey post hoc test was performed for significant ANOVA. The multiple correlation between total SC-D scale score, FTM scale score, HRF knowledge score, and TPA was computed to examine the relationship between the four variables, while the contribution of those three independent variables PA as dependent variable was examined by applying multiple regression. All the data analyses were completed using SPSS 13.0. Significance was set a priori at an alpha- value of .05.

4. Results
4.1. Multiple correlation between SC-D, HRFK, FTM, and PA
The multiple correlation among SC-D, HRK knowledge, FTM, and PA was fairly high (.858 < .05), while coefficient determination was 73.6%. A partial analyses (t test) was applied to examine the “contribution” of each independent variable, SC-D, HRFK, FTM to PA. The result of analyses showed that both HRFK (5.687) > t table (1.972), and SC-D (5.769) > t table (1.972) give significant contribution partially to PA, while FTM (1.290) < t table (1.972), give insignificant contribution partially.

4.2. Multiple regression between SC-D, HRFK, FTM, and PA
To examine the contribution of SC-D (X1), FTM (X2), and HRFK (X3) to PA (Y), a multiple regression analyses was applied. The result of analyses as follows: Y = -1018.108 + 25.086X1 + 7.055X2 + 63.697X3. This equation means that contribution of HRF knowledge (b3 = 63.697) was far more powerful than SC-D (b1 = 25.086), and FTM (b2 = 7.055) to PA.

4.3. The distinction among motivation components

| Motivation        | Sum of Squares | df | Mean Square | F     | Sig.  |
|-------------------|----------------|----|-------------|-------|-------|
| Between Groups    | 858.835        | 3  | 286.278     | 28.557| .000  |
| Within Groups     | 8220.466       | 820| 10.025      |       |       |
| Total             | 9079.301       | 823|             |       |       |

The result of ANAVA analyses indicated that there was significant distinction among motivation components, extrinsic, introjected, identified, and intrinsic. Value of significance showed that p-value 0.0000 was lower than value of α =5%. So, the conclusion was that there was significance distinction among motivation components, extrinsic, introjected, identified, and intrinsic.

5. Discussion

5.1. Contribution and correlation among predictors and PA.
It seems clear that a multiple correlation among SC-D, HRK, FTM, and PA was fairly high and significant (R= 0.858, p < 0.05), while determination coefficient was high enough (R^2 = .858^2), namely 73.6%. But SC-D and HRFK give significant contribution partially to PA. It was more clear that HRFK was far more powerful than SC-D and FTM to predict PA. This finding tend to support a thesis that the low of self-control related to the decrease of commitment to participate in PA.

This finding tend to support self-control and delay gratification theory in which self-control contains power to control impulse or to sustain determination, HRF knowledge as a determinant factor to predict PA. They conclude that the correlation between HRF knowledge and PA is low and insignificant. This finding support Planned Behavior Theory that stressed on the role of knowledge to attitude formation, and attitude in turn to influence behavior related to PA.

5.2. The role of motivation
The findings of this study has also showed that extrinsic motivation play a dominant role compare with intrinsic motivation. This revealed the dominant role of intrinsic motivation and identified regulation as a more powerful predictor of PA among Chinese students.

6. Limitation
Self-administered questionnaire such as IPAQ-Short possessed some limitations related to the accuracy of information which have been reported by students. Their report was also affected by “social desirability” judgment, to revealed unlogic response to questionnaire. This limitation related to the ambiguity of terminology such as “vigorous,” “moderate,” while students identified their PA events. It seems clear that some of students were not able to recall their PA events (minutes per session and frequency per week).

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