Using Social Cognitive Theory to Predict Exercise Behavior among South Asian College Students

Taj Haider*, Manoj Sharma and Amy Bernard

Health Promotion & Education, University of Cincinnati, Cincinnati, USA

Abstract

South Asian populations, specifically those of Indian, Pakistani and Bangladeshi ethnic origin, have the lowest levels of physical activity compared to any other ethnic group in the US. Evaluating the predictors of exercise among South Asians is necessary to implement an intervention to reduce the high prevalence of diabetes and coronary heart disease among this population.

This study assessed the exercise levels of South Asian college students using constructs of the social cognitive theory through a web-based (Survey Monkey™) survey. Cronbach’s alpha coefficient was measured revealing all sub-scales to be above 0.80, proving good to excellent internal consistency. Correlation coefficient was measured for each subscale through test-retest reliability (correlation significant at the 0.01 level).

Statistical analysis of the 58 South Asian college student’s responses revealed that only self-efficacy was predictive of exercise behavior (R²=0.082). Low scores for social support, self-efficacy to overcome barriers and exercise goals was also found. The majority of the respondents were first generation (81.5%), Indian (94.4%), graduate level (92.6%) immigrants. Neither gender (p=0.355) nor immigration (p=0.885) were found to act as covariates for exercise levels. This data suggests that by increasing self-efficacy among South Asian college students to participate in particular exercises may increase their exercise levels, but low scores for many of the constructs suggests a need to further explore predictors of exercise among this population.

Keywords: Social cognitive theory; Exercise; South Asians

Introduction

The South Asian population in the US is unaccounted for in health literature. Furthermore, South Asian immigrants have been shown to have the lowest levels of exercise compared to the general population in the United Kingdom, but no such study has been implemented in the US [1]. Diabetes is more prevalent in South Asian populations than their white counterparts, nineteen percent as opposed to four percent, respectively [2]. To decrease the risk of diabetes and coronary heart disease exercise behavior must be induced, as it is modifiable, unlike genes or gender. The expectation for this study it can lay the groundwork for more studies, resulting in the creation of exercise interventions for South Asian college students.

Previous studies have shown that by improving the self-efficacy and social support of college students has lead to an increase in exercise [3]. Due to the emphasis on personal health behaviors as predictors of exercise, Social Cognitive Theory (SCT) would be applicable in determining the attitudes South Asian college students have about exercise [4]. A study performed in Iran applied the SCT to assess the influences surrounding female adolescents exercise levels. A questionnaire including sub-scales of social support, outcome expectations, self-efficacy and self-control was utilized. Results showed that social support from parents and siblings might lay the foundation for exercise development and maintenance [5].

A randomized control trial of overweight and obese adults in North Carolina compared a control, weight-loss podcast, intervention and an enhanced, SCT-based weight loss podcast, intervention. Results illustrated that those in the enhanced group engaged in vigorous activity more often than the control group, leading to an increased weight loss [6].

This suggests that SCT-based podcast was more efficacious.

Materials and Methods

The design used by the study was cross sectional design. Fifty-eight South Asian college students from two Midwestern universities participated in this study, unfortunately, permission to include a third, much larger university with a large population of South Asians, was denied last minute, having an effect on the sample size. To participate in the study, one or both of the student’s parents had to identify themselves as Bangladeshi, Bhutanese, Indian, Pakistani, Nepali or Sri Lankan. These students must have been enrolled in a degree program, full-time or part-time during winter and/or spring quarter 2011 at either the Ohio University or University of Cincinnati.

After determining the constructs to be included in the survey pre-existing sub-scales from two experts in the field were found and used with permission. The sub-scale exercise goals was obtained from the Exercise Goal Setting Scale with permission from Dr. Rovniak. This sub-scale had been previously used in Project GRAD, a randomized control trial of a university-based exercise intervention that utilized constructs of SCT [7]. The sub-scales of social support and self-efficacy to overcome impediments were obtained, with permission, from Dr. Jim Sallis [8]. These subscales have established validity and reliability. The remaining scales of seven-day exercise recall, expectations (outcome expectancies x outcome expectations) and self-efficacy to perform exercise were developed and validated for face and content validity by a panel of experts in two rounds. The experts enlisted were skilled in the areas of South Asian population studies, social cognitive theory and its applications, exercise behavior/interventions and exercise among college students (theory, population and subject-based experts).

*Corresponding author: Taj Haider, Health Promotion & Education, University of Cincinnati, 5596 Hayden’s Reserve Way, Hilliard, OH 43026, USA, Tel: (513) 4488847; E-mail: haider@uc.edu

Received May 17, 2012; Accepted June 07, 2012; Published June 09, 2012


Copyright: © 2012 Haider T, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.
The survey consists of nine sections of multiple-choice questions mediating exercise behavior utilizing a Likert Scale with scoring from 0-4. For exercise recall the students were asked to recall their recent exercise behavior over the last seven days, if they answered yes for any day of the week they were asked how many minutes. The construct of social support was tested by using a series of statements pertaining to regular exercise that could be said or done by a friend or family member of the participant (two sub-scales 5 questions each). This portion of the survey was taken from the Social Support and Exercise Survey previously used for studies of college students [8]. Expectation is a five item scale asking students whether they agree the statement regarding exercise is true (outcome expectations) and whether it matters (outcome expectancies). For example, Exercise:……Improves my physical appearance. The responses listed are strongly agree (4), agree (3), neither agree nor disagree (2), disagree (1) and strongly disagree (0). Does it matter? A one rating being it will not matter at all and a five being it will matter very much.

The construct of self-control, labeled Exercise Goals on the survey, was obtained from the Exercise Goal Setting Scale with permission from Dr. Rovniak. An example of a statement used in the survey is, I usually set dates for achieving my exercise goals. The students were then asked to rate how much each statement describes them from one to five. A one being a statement that does not describe me and a five being a statement that describes me completely. The psychometric properties of Dr. Rovniak’s Exercise Goal Setting Scale are as follows. The internal consistency for this scale was measured using a Cronbach’s alpha to be 0.89. A pilot study for the test-retest reliability of this scale was done and the correlation coefficient was measure to be 0.87. The statements used in this scale were developed from the pilot study as well as adopted from Weinberg’s recommendations on goal setting strategies [7].

The sub-scale of self-efficacy to perform exercise behavior consists of five items addressing the participant’s confidence and capability of performing certain exercise behaviors. Using a Likert scale (not at all (0), slightly sure (1), moderately sure (2), totally sure (3), totally sure (4)) the participant was asked to rate their confidence to perform each type of exercise for at least 30 minutes continuously.

Lastly, self-efficacy to overcoming impediments was obtained, with permission, from “the development of self-efficacy scales for health-related diet and exercise behaviors” [9]. This section is meant to allow the participant to decide how confident and capable they are to surmount the given obstacle.

Because many of the sub-scales were newly developed, an initial pilot test was completed to ensure test retest reliability, which was found to be acceptable (correlation coefficient >0.70). Cronbach’s alpha measurements were also performed. All sub-scales correlation coefficients were above 0.80 demonstrating they were either good or excellent regarding internal consistency deemed by the “rule of thumb” created by George and Mallery in 2003 [10]. Construct validity by factor analysis was performed on each subscales using the Kaiser Criterion stating that only factors with eigen values greater than one can be retained. The eigen values for each of these sub-scales was greater than one. For the factor loading cut off, determined by sample size, Stevens states that the critical value be doubled [11]. For this study the sample size of 58 was used (a sample size of 50 was used for simplicity purposes) and the critical value was determined to be 0.361, 0.361*2 is 0.722. For a critical value cut off of 0.722 the majority of statements from each subscale meet the cut off (Table 1).

The survey was uploaded to Survey Monkey” and South Asian student organizations on each campus. The data analyses were performed using Statistical Package for Social Sciences (SPSS) Version 12.0. To estimate the sample size the G* Power 3.1.2 analysis program

Table 1: Construct Validity Measurements for each Subscale of the Exercise Behavior Survey.
was used. For the majority of health promotion studies small to medium sample sizes are commonly used. For this study the effect size was chosen to be 0.25 based on similar studies. The α was 0.05, the power (1-Beta) = 0.80 using the total number of predictors to be six. The six predictors were the constructs of the SCT being assessed as predictors of exercise in this study. Using this data a sample size of 62 was found to be sufficient [12].

Result

The instrument was completed by 58 South Asian college students, of which 54 (93.1%) completed the survey in its entirety. The majority of the respondents identified themselves as Indian (94.4%), first generation (81.5%), graduate students (92.6%), in the engineering sciences (48.3%) and from the University of Cincinnati (94.4%). Two students identified themselves as of Sri Lankan descent, while one student identified himself as Pakistani. Gender among participants was evenly distributed, as 44.4% of the participants were female and 55.6% male. The average age of the participants was 23.95 years and the participants ranged in age from 18 to 42 years.

Descriptive statistics were used to reveal the distribution of responses of each subscale of the instrument. These are presented in Table 2. Low scores were found for exercise levels, self-control, social support and self-efficacy to overcome barriers.

Inferential statistical analyses were also performed using stepwise multiple regression to determine the predictors of exercise for South Asian college students in this study. The only construct that was shown to predict some of the variance of exercise was self-efficacy to perform exercise. It was shown that 8.2% of the variance of exercise behavior could be predicted by self-efficacy to perform exercise as presented in Table 3.

Immigration generation and gender were tested as covariates for predicting exercise behavior. Multiple regression analysis using enter method was used here. Neither immigration generation nor gender was shown to predict exercise behavior for the participants in this study as shown in Table 4.

Discussion

There have been no studies, previously, attempting to determine the predictors of exercise behavior in South Asian college students. Many studies have examined the high rates of coronary heart disease and diabetes in this population, identifying their lack of physical activity and sedentary pursuits as key contributing factors [13]. It has also been suggested that the longer South Asian immigrants live in the US their risk for chronic disease increases [14]. Studies have shown that regular moderate physical activity is associated with a thirty to fifty percent reduction in the risk of coronary heart disease, as well as a reduction in obesity, diabetes and stroke [1]. The result of the study showed that only self-efficacy to participate in exercise was a statistically significant predictor of exercise behavior.

Expectations (outcome expectancies multiplied by outcome expectations) was excluded as a predictor of exercise. On average, the respondents scored outcome expectations of exercise highly, but it was not shown to significantly influence their exercise levels (Table 2). Studies have suggested that there is a strong need for education of the benefits of exercise for Asian Indian immigrants in the US, as they were not aware or did not fully understand the benefits of this activity [15]. Here many of the respondents did agree what the benefits of exercise were, but many responded that it did not matter to them (low outcome expectancy scores), exploratory studies of what benefits of exercise are for South Asian college students may contribute to increasing these scores, therefore increasing exercise.

Self-efficacy to participate in exercise did predict some of the variance of exercise in this study and it was not excluded as a predictor. Previous studies have shown that by improving the self-efficacy of college students has lead to an increase in exercise [3]. It’s suggested that self-efficacy is the most important factor in predicting healthy behaviors and creating behavior change [16].

Self-efficacy to overcome barriers was excluded as a predictor of exercise behavior. Previous studies regarding exercise in college students found that facility obstacles and fatigue played a larger role in preventing students from participating in exercise [17]. In this

Table 2: Distribution of Means and Standard Deviations of the Constructs of Social Cognitive Theory and the Seven Day Exercise Recall.

<table>
<thead>
<tr>
<th>Construct</th>
<th>n</th>
<th>Possible Range</th>
<th>Observed Range</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise (in minutes)</td>
<td>58</td>
<td>0-3500</td>
<td>0-480</td>
<td>143.69</td>
<td>112.9</td>
</tr>
<tr>
<td>Expectations</td>
<td>56</td>
<td>0-80</td>
<td>12-48</td>
<td>35.59</td>
<td>9.54</td>
</tr>
<tr>
<td>Exercise Goals (Self-control)</td>
<td>54</td>
<td>0-40</td>
<td>0-38</td>
<td>15.89</td>
<td>10.05</td>
</tr>
<tr>
<td>Family Social Support</td>
<td>54</td>
<td>0-20</td>
<td>0-19</td>
<td>7.33</td>
<td>6.12</td>
</tr>
<tr>
<td>Friend Social Support</td>
<td>54</td>
<td>0-20</td>
<td>0-13</td>
<td>8.31</td>
<td>5.32</td>
</tr>
<tr>
<td>Self-Efficacy</td>
<td>54</td>
<td>0-20</td>
<td>0-20</td>
<td>12.67</td>
<td>4.85</td>
</tr>
<tr>
<td>Self-Efficacy to Overcome Barriers</td>
<td>54</td>
<td>0-20</td>
<td>0-17</td>
<td>6.98</td>
<td>4.97</td>
</tr>
</tbody>
</table>

Table 3: Stepwise Multiple Regression Analysis of Total Exercise in Minutes as Predicted by SelfEfficacy (adjusted R²=0.082).

<table>
<thead>
<tr>
<th>Source</th>
<th>Unstandardized Coefficients</th>
<th>Standard Error</th>
<th>Standardized Coefficients Beta</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>61.39</td>
<td>37.550</td>
<td>0.315</td>
<td>1.635</td>
<td>0.108</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>6.624</td>
<td>2.772</td>
<td></td>
<td>2.391</td>
<td>0.020</td>
</tr>
</tbody>
</table>

Table 4: Multiple Regression Analysis of Exercise in Minutes and Gender and Immigration Generation.

<table>
<thead>
<tr>
<th>Source</th>
<th>Unstandardized Coefficients</th>
<th>Standard Error</th>
<th>Standardized Coefficients Beta</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>131.038</td>
<td>23.388</td>
<td>0.132</td>
<td>5.603</td>
<td>0.000</td>
</tr>
<tr>
<td>Gender</td>
<td>27.475</td>
<td>29.444</td>
<td>0.035</td>
<td>0.933</td>
<td>0.355</td>
</tr>
<tr>
<td>Immigration Generation</td>
<td>-5.376</td>
<td>37.106</td>
<td>-0.021</td>
<td>-0.145</td>
<td>0.885</td>
</tr>
</tbody>
</table>
study those types of barriers were not addressed, rather academic performance and social activities were the focus. Future studies may find it necessary to take into account a variety of barriers. In addition, respondents scored low regarding this construct, suggesting that improving their ability to overcome barriers may influence their ability to participate in exercise (Table 2).

Self-control, measured as exercise goals in this study, was not a predictor of exercise. A previous study regarding Asian Indian women revealed an inverse relationship between education level and self-control scores [18]. Therefore, college students being more educated may be less likely to adopt an exercise regimen based on their low self-control scores.

Based on the results of this study, social support was excluded as a predictor of exercise. Studies have suggested that for college students and South Asian immigrants social support acts as a strong predictor of exercise, here though, South Asian college students, first or second immigrants, are accustomed to being apart from their family and friends, therefore their reliance on social support may not be as important. Considering respondents scored low in both family and friend social support it may be necessary to increase these constructs to fully understand its influence on exercise behavior.

Covariates tested in this study were gender and immigration generation, but both were excluded as predictors of exercise. A possible explanation could be found in a study comparing students of different ethnicity. It was shown that for Caucasian, South Korean and Puerto Rican students gender was predictive of exercise behavior, but not for Indian students [19]. Previous studies of older South Asian immigrants revealed that those immigrants that had been longer residence to the US and those with a more bicultural or American identity participated in exercise more often than those who have not lived in the US as long and felt acculturated [20]. Although, the results of this study differed, it may be explained by the previous study being of older South Asian immigrants who may have more difficulty becoming assimilated to a new culture, while younger South Asian immigrants may find the transition easier. In addition, first generation immigrant participants were over-represented in this study leading to skewed results of this covariate. Future studies that include a larger sample size with more evenly distributed first and second generation immigrants could clarify the predictive value of immigration generation. Ethnicity was not identified as a covariate in this study considering the similarity of the culture and values of the countries comprising South Asia.

Limitations of this study include the use of self-reported responses and could have included both participant bias and dishonesty. Participants could have misinterpreted or misunderstood some of the questions, thereby misrepresenting their responses. Although the pilot test did reveal that the survey had a high level of reliability/stability. Participants were not selected from random from a large sample pool, but were limited to college students at two large public universities in Ohio. Due to the difficulty in finding South Asians to participate in the study the sample size was small, not allowing the results to be generalizable.

Strengths of this study include the developed instrument’s expressive psychometric properties. With high Cronbach’s alpha (all above the 0.80 level) and test-retest reliability results of all sub-scales correlation coefficient greater than 0.70 this scale the scale has proven to be reliable with a high level of internal consistency. Construct validity of the scale proved that each sub-scale is measuring the construct it was developed to measure.

Although, the sample size was small, it is the first study of its kind and may lead to similar studies to be performed as researchers begin to understand the health-risk confronting the South Asian population do to their lack of exercise.

This study is important for health education as it covers an understudied group and identifies salient constructs from social cognitive theory that can be used in designing concerted health education programs influencing exercise for this group of population. This study lends credence to the applicability of social cognitive theory to exercise behavior in South Asian college students. Particularly the construct of self-efficacy for exercise was found to be important. Self-efficacy for exercise can be built by enhancing mastery for exercise in small steps, using role models, using persuasion and reinforcement and reducing stress associated with implementing the exercise behavior.

References