Exercise Self-Efficacy and Social Norms as Psychological Predictors of Exercise Behavior

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ABSTRACT

While exercise behavior has been linked to demographics, behavioral factors, and exercise self-efficacy, descriptive social norms have shown conflicting results. This study examined the relationship between exercise self-efficacy and social norms for exercise while controlling for demographics and sedentary behaviors. It was hypothesized that higher exercise self-efficacy and social norms would predict higher levels of physical activity and that males would have higher overall physical activity levels than females. Using data from a cross-sectional telephone survey in Hawaii, logistic regression indicated that meeting walking recommendations was significantly predicted by gender (male), lower BMI, sitting/standing per day, and higher exercise self-efficacy and social norms, p<0.05, successfully classifying 61.9% of participants. Almost 7% of the variance in MET-minutes per week was predicted by gender, age, normal weight ethnicity (Hawaiian), less sitting/standing per day, and higher exercise self-efficacy and social norms, F(8,3915)=35.41, p<0.001. Exercise interventions should address self-efficacy and social norms. Future research should examine descriptive social norms for moderate and vigorous physical activity.

Introduction

Despite the well established benefits of physical activity, just under half of Americans engage in recommended levels of physical activity, defined as 30 minutes a day, five or more days a week of moderate activity or 20 minutes a day, three days a week of vigorous intensity activity (Centers for Disease Control and Prevention [CDC], 2005a). To address this problem, researchers have examined many potential correlates of physical activity, including demographic factors (Brownson, Jones, Pratt, Blanton, & Heath, 2000; Eyler, Brownson, Bacak, & Housemann, 2003; Mampilly, Yore, Maddock, Nigg, Buchner, & Heath, 2005), psychosocial factors (Baker, Little, & Brownell, 2003; Eyler, Brownson et al.;
Athletic Insight - Exercise Self-Efficacy and Social Norms as Psychological Predictors of Exercise Behavior

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Whites have been shown to have higher physical activity levels than both African Americans and Hispanics (Crespo, Smit, Andersen, Carter-Pokras, & Ainsworth, 2000). Data from the Behavioral Risk Factor Surveillance System (BRFSS) have shown that ethnic differences also exist among Asian and Pacific Islander (API) groups (Mampilly et al., 2005). Native Hawaiians or Part Native Hawaiians reported the highest moderate and vigorous activity levels for API groups, followed by Japanese and Filipinos, while overall; Whites were the most active group in the study (Mampilly et al.). Higher education levels have been directly linked to higher physical activity rates (Eyler, Brownson et al., 2003; Brownson et al., 2000), and age differences have indicated that older individuals have lower rates of moderate activity. Regarding regular, vigorous physical activity, BRFSS data have shown that women and older adults aged 65-74 years had the highest rates, although overall participation in moderate physical activity was less frequent amongst older age groups, ethnic minorities, persons of lower socio-economic status, and current smokers (Brownson et al.). Regardless of race and ethnicity, one study found women had lower rates of leisure time inactivity than men (Crespo et al., 2000).

In addition to demographic influences on exercise behavior, psychosocial factors have also been studied as possible physical activity correlates. Self-efficacy has been found to be the most consistent psychosocial correlate of physical activity (Trost, Owen, Bauman, Sallis, & Brown, 2002). According to Bandura (1977), self-efficacy can be defined as the belief a person has in their ability to complete a specific action. Self-efficacy is a situation-specific form of self-confidence (Cox, 2007) and has been frequently measured by having participants rate their confidence levels to overcome common barriers to physical activity (Plotnikoff, Hotz, Birkett, & Courneya, 2001; Rhodes & Blanchard, 2007). Research has shown that participants who had a high level of confidence to complete physical activities, despite obstacles, were more likely to actually engage in exercise behaviors than participants with low exercise self-efficacy (Kim, 2007).

Social norms are another psychosocial factor that influences health behaviors and can improve self-efficacy for physical activity (Fleury & Lee, 2006). Social norms reflect the development of values and standards for specific behaviors. They help individuals understand acceptable standards within their peer group and provide community members with examples of desirable behaviors (Fleury & Lee). Social norms can be behavioral (i.e., descriptive), referring to the most common behaviors within a group, or attitudinal (i.e., injunctive), referring to perceptions and value judgments of how group members and people as a whole should behave (National Social Norms Research Center, n.d.; Okun, Ruehlman, Karoly, Lutz, Fairholme, & Schaub, 2003). Research has shown that simply knowing other people who exercise and seeing people exercise in the neighborhood (behavioral social norms) have both been linked to meeting exercise recommendations for groups of Native American, Latinas, and rural African American women (Eyler, Matson-Koffman et al., 2003). Behavioral social norms have been found to be a significant predictor of vigorous physical activity behavior (Okun et al., 2003). However, one study did not find a statistically significant relationship between behavioral social norms that were globally framed (i.e., asking about physical activity behavior for people in general) and self-reported physical activity (Maddock, Marshall, Nigg, & Barnett, 2003).

Time spent in sedentary behaviors (e.g., standing or sitting and watching television) may reduce the amount of time available for physical activity (Buckworth & Nigg, 2004; Dietz & Gortmaker, 1985; Robinson, 1999). For example, increased television watching for children has been linked to both decreased physical activity (Andersen et al., 1998; Crespo et al., 2001) and higher obesity prevalence (Crespo et. al, 2001; Dietz & Gortmaker, 1985). Adults who spent more time sitting or standing at work were half as likely to achieve regular moderate physical activity levels (outside of work) than those who spent time walking at work and two times less likely than those that did heavy labor (Kruger, Yore, Ainsworth, & Macera, 2006). An examination of national data showed that sedentary behaviors varied by weight status, where overweight and obese adults were significantly more likely to spend 3 or more hours in sedentary behaviors (i.e., watching television or spending time on the computer outside of work) than were adults of normal weight (McDowell, Hughes, & Borrrud, 2006). One study of college students found that sedentary behaviors also varied by gender; males spent significantly more time watching television and on the computer than females (Buckworth & Nigg). Interestingly, for the female college students, more time spent watching television was correlated with less physical activity, while no correlation was found between these variables for males (Buckworth & Nigg). A longitudinal study examining associations between television watching and physical activity found that leisure-time moderate or vigorous physical activity was not affected by changes in television viewing for adolescents (Taveras et al., 2007), nor was physical activity found to be the mediating link between television watching and body weight for adults (Jeffrey & French, 1998). It is possible that watching television and leisure-time physical activities are two different concepts and not functional opposites (Taveras et al., 2007). To assess this relationship further, research should include different types of sedentary behaviors when studying correlates of physical activity.
Asians are currently the fastest growing ethnic group in the US (Le, 2007). Due to Hawaii's large percentage of Asian and Pacific Islanders (41.5% versus 4.3% nationally in 2005; U.S. Census Bureau, 2007) and higher rates of physical activity (52.4% for Hawaii versus 48.1% nationally; CDC, 2005b), an examination of the correlates of exercise behavior in this population would provide unique data. The purpose of this study was to investigate the relationship between physical activity and exercise self-efficacy and the presence of social norms for exercise while controlling for demographic variables and sedentary behaviors. It was hypothesized that 1) meeting walking recommendations and 2) more weekly MET-minutes of physical activity would be predicted by higher exercise self-efficacy and higher social norms for exercise.

Method

Design

This study used data from a cross sectional telephone survey conducted in the state of Hawaii during spring 2006.

Participants

A total of 4594 adults were surveyed. On average, participants were 49.8 years (y) old (sd = 16.8) with an age range of 18y to 95y. Just over half of the participants were female (56.2%, n = 2391), married (59.6%, n = 2501), and had household incomes of $60,000 or more (51.3%, n = 1516). Almost 43% (n = 1813) of participants reported being college graduates, and average household size was 3.27 persons (sd = 2.06). Over 43% of the participants (n = 1748) were of normal weight (body mass index; BMI = 18.5-24.9), while 2.9% (n = 117) were underweight (BMI = < 18.5), 33.7% (n = 1346) were overweight (BMI = 25-29.9), and 19.5% (n = 778) were obese (BMI ≥ 30). The sample included 1417 Whites (33.8%), 852 Japanese (20.3%), 755 Native Hawaiians (18.0%), 436 Filipinos (10.4%), 191 Chinese (4.5%), and 547 from other various ethnic backgrounds (13.0%). Fifty-eight participants did not provide their ethnicity.

Materials

The purpose of the 2006 cross-sectional survey was to track self-reported attitudes and behaviors related to nutrition, physical activity and tobacco for the Healthy Hawaii Initiative (HHI), a multi-year social ecological intervention to increase physical activity, improve nutrition and reduce tobacco use among the people of Hawaii. This study examined a subset of survey questions from the HHI survey including demographic factors; self-reported weekly minutes of walking, moderate physical activity and vigorous physical activity; exercise self-efficacy; and exercise social norms. To capture sedentary behaviors, questions about the amount of weekly minutes spent sitting or standing and hours spent watching television were included.

Participants were asked the following three questions about walking, moderate physical activity and vigorous physical activity from the International Physical Activity Questionnaire (IPAQ, 2004; Craig et al., 2003):

1. Over the last week, on how many days did you [walk, do moderate physical activity, do vigorous physical activity] for at least 10 minutes at a time for exercise?
2. How much time in total did you usually spend [walking, doing moderate physical activities, doing vigorous physical activities] on one of those days in hours?
3. How much time in total did you usually spend [walking, doing moderate physical activities, doing vigorous physical activities] on one of those days in minutes?

Exercise self-efficacy was assessed by three questions concerning the participants' confidence in their ability to exercise when it was raining, when they were under a lot of stress, and when they felt they did not have the time. Participants then ranked their level of confidence on a five-point Likert scale from 1 (not at all confident) to 5 (completely confident). Internal consistency for the scale was good (α = 0.79). A composite exercise self-efficacy score was computed by adding the three questions together for a possible range of 3-15, with higher scores indicating greater exercise self-efficacy.

Social norms for exercise were assessed by three questions that asked about behavioral social norms for specific groups. The questions asked whether most of the participants' family members, friends, and people they knew walked for at least 30 minutes almost every day. These questions were answered on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Internal consistency for the scale was good (α = 0.77). A composite of social norms for exercise score was computed by adding the three questions together for a possible range of 3-15, with higher scores indicating the presence of more social norms for exercise.
To assess sedentary behaviors, additional questions from the IPAQ were asked. Participants were asked how much time in total they usually spent sitting or standing over the past week, which was used to calculate the number of sitting and standing minutes per day. Participants were also asked the number of hours of television they watched on a typical day.

**Procedure**

Using computer-generated random-digit dialing procedures potential participants were contacted by phone. The person over 18 years of age who had the last birthday was invited to participate in the survey. Participants were informed that this was a statewide survey on health and that their responses would help with the planning of future health programs in their local area. Participants were informed that their phone number was randomly selected by a computer. Participants were told that the survey would take approximately 20 minutes and they could skip questions if desired. Participants had to give verbal consent to participate in the survey before any further questions were asked. A total of 4594 adults participated in the survey, for a response rate of 48%. The study was approved by the institutional review board of the University of Hawaii.

**Analysis**

Although 4594 adults participated in the survey, data for social norms and exercise self-efficacy were missing for 351 participants, leaving a final sample of 4243 (92.4%) for analysis. Descriptive statistics were used to describe the weekly minutes of walking, moderate physical activity and vigorous physical activity. Due to the non-normal distribution of each type of physical activity (i.e., walking, moderate and vigorous physical activity) and the tendency for participants to overreport, each variable was truncated at 240 minutes (m; 4 hours) per day and median values were reported as recommended (IPAQ, 2004). A total of 150m or more per week of moderate physical activity, including walking, has been recommended by the American College of Sports Medicine (ACSM, 2003). Additionally, ³ 60m per week of vigorous physical activity is recommended. The percentages of participants who did no physical activity and the percentages of participants who met ACSM recommendations for each category (i.e., walking, moderate and vigorous physical activity) were reported.

To determine the overall volume of activity obtained by each participant per week, each type of physical activity was first weighted by its energy requirements defined in metabolic equivalents (METs), or multiples of the resting metabolic rate (IPAQ, 2004). Then, MET-minutes (MET-m) were calculated by multiplying the daily minutes by the MET score for that activity (i.e., walking = 3.3 METs, moderate physical activity = 4.0 METs, and vigorous physical activity = 8.0 METs). The IPAQ was designed so that the MET-m from all three physical activity categories could be added together for a total amount of MET-m per week. At least 600 MET-m per week was specified as the necessary amount needed to meet ACSM recommended guidelines, while those who completed at least 3000 MET-m per week achieved the level of ÔHealth-Enhancing Physical ActivityÔ (HEPA; IPAQ, 2004).

Ethnic differences in weekly MET-m of walking, moderate physical activity, vigorous physical activity, and meeting HEPA guidelines were explored through one-way ANOVAs. Next, percentages were calculated for all baseline demographic variables stratified by each physical activity guideline (i.e., met walking, moderate physical activity, vigorous physical activity, and HEPA recommended guidelines). Using chi-square analyses, statistically significant differences were noted by gender, as males were expected to do more of each than females. For exercise self-efficacy and exercise social norms, paired t-test comparisons were calculated by gender. Paired t-test analyses were computed for each sedentary behavior between genders and weight status groups (i.e., underweight and normal weight as compared to overweight and obese participants).

For hypothesis testing, two separate analyses were conducted. First, a logistic regression was run with meeting walking recommendations as the dependent variable. To control for relevant demographic and sedentary behavior variables, they were entered in the first step of the analysis. Those not meeting the criteria of $p < 0.05$ were removed. In the second step of the analysis, exercise self-efficacy scale, and social norm scale variables were entered, and any non-significant variables were removed until a statistically significant model remained. Next, a stepwise linear regression was run to predict Met-m per week. To account for demographic and sedentary behavior variables, relevant factors were entered in the first step of the model, and those greater than $p = 0.05$ were removed. In step 2, the exercise self-efficacy scale and social norm scale variables were entered, and any variables greater than $p = 0.05$ were removed until a statistically significant model remained. All statistical analyses were performed using SPSS® (version 15.0; SPSS Inc., Chicago, IL, USA).

**Results**
Physical Activity

Participants reported a median of 150m of walking per week and 30m of walking per day. The median number of weekly minutes of moderate physical activity was 100, with daily moderate physical activity of 30m. Median vigorous physical activity was 0m per week. Almost 20% of participants \((n = 831)\) reported no walking, while 50.3% \((n = 2142)\) reported doing the recommended 150m or more per week. No moderate physical activity was reported by 32.4% of participants \((n = 1379)\), while 40.8% \((n = 1737)\) reported meeting or exceeding recommendations (i.e., 150m per week). Over half of participants, 51.1% \((n = 2174)\) reported doing no vigorous physical activity, while 42.4% \((n = 1802)\) reported doing the recommended 60m per week or more. Just over 8% \((n = 355)\) of the participants were inactive, 17.1% \((n = 728)\) were insufficiently active (i.e., did not meet recommended MET-m per week, although they did some physical activity), 41.2% \((n = 1752)\) met the recommended 600 or more MET-m per week, and 33.4% \((n = 1421)\) of participants achieved HEPA of 3000+ MET-m per week.

Statistically significant differences were found between ethnicity and weekly MET-m of walking, \(F(5, 4180) = 5.06, p < 0.001\); weekly MET-m of moderate physical activity, \(F(5, 4180) = 2.70, p < 0.05\); weekly MET-m of vigorous physical activity, \(F(5, 4180) = 4.77, p < 0.001\); and meeting HEPA guidelines, \(F(5, 4180) = 8.89, p < 0.001\). Scheffe post hoc analyses indicated that both White and Japanese participants walked significantly more than Filipino participants, \(p < 0.05\). Japanese participants did significantly more moderate and vigorous physical activity than Native Hawaiians, \(p < 0.05\). Japanese participants also were significantly more likely to meet HEPA guidelines than Whites, Native Hawaiians, Filipinos, and participants of other ethnicities, with Whites significantly more likely to meet HEPA guidelines than Native Hawaiians, \(p < 0.05\).

Table 1 displays the percentages of participants who met recommended weekly levels of walking, moderate physical activity, vigorous physical activity and HEPA by gender across each specific demographic category. Males reported significantly higher levels than females of moderate physical activity \((t = 3.13, p < 0.01)\), vigorous physical activity \((t = 6.53, p < 0.001)\), and HEPA \((t = 5.88, p < 0.001)\). A higher percentage of White, Native Hawaiian, and Filipino males met moderate physical activity recommendations than did females, \(p < 0.05\). Males who were married, had higher income and education, and who were of normal weight were significantly more likely to meet moderate physical activity recommendations than females with those characteristics \((p < 0.05)\). Statistically significant gender differences were also found in every demographic category for meeting vigorous physical activity recommendations. In all cases, a higher percentage of males met the recommendations than females \((p < 0.05)\). Percentages of males who met recommended levels of HEPA were significantly higher than females in every demographic category \((p < 0.05)\) except for Filipinos and those of other ethnicities.
Exercise Self-Efficacy and Social Norms

For exercise self-efficacy, females had slightly lower scores ($m = 8.63, sd = 3.47$) than males ($m = 8.98, sd = 3.58$). This difference was statistically significant, $t = 153.94, p < 0.001$. Social norms for exercise also varied by gender, with females having significantly higher scores ($m = 9.04, sd = 2.86$) than males ($m = 8.85, sd = 2.79; t = 191.98, p < 0.01$).

Sedentary Behaviors

An examination of sedentary behaviors showed that males spent significantly more minutes per day sitting or standing ($t = 80.89, p < 0.001$) and watching television ($t = 63.95, p < 0.001$) than did females. Participants who were overweight or obese spent significantly more minutes sitting or standing ($t = 77.69, p < 0.001$) and watching television ($t = 30.89, p < 0.001$) than did participants who were underweight or normal weight.

Analysis for Hypothesis 1

The direct logistic regression analysis indicated that the model with demographic, sedentary behaviors, social norms, and self-efficacy variables as predictors against a constant-only model was statistically reliable, $\chi^2(5, n = 3849) = 312.74, p < 0.001$, signifying that the predictors, as a set, reliably distinguished between those meeting walking recommendations and those not meeting walking recommendations. The variance in meeting walking recommendations accounted for was small, however, with $R^2 = 0.10$. The model correctly predicted 56.3% of those who did not meet walking recommendations and 67% of those who did meet walking recommendations, for an overall success rate of 61.9%.

Table 2 shows regression coefficients, Wald statistics, odds ratios, and 95% confidence intervals for odds ratios for each of the significant predictors. According to the Wald criterion, gender, BMI, sitting or standing m/day, exercise self-efficacy, and exercise social norms reliably predicted meeting walking recommendations, $p < 0.05$. Odds ratios indicated
that a one point increase in social norm score increased the probability of meeting walking recommendations by 15%. A one point increase in self-efficacy score increased the probability of meeting walking recommendations by 8%. Males were 15% more likely to meet walking recommendations than females.

### Table 2. Logistic Regression Analysis of Meeting Walking Recommendations.

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>Wald</th>
<th>Ratio</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1: Demographic and Sedentary</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
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<td>4.154*</td>
<td>1.15</td>
<td>1.01</td>
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<td><strong>Step 2: Psychosocial</strong></td>
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<tr>
<td>Exercise Self-Efficacy</td>
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<td>60.99***</td>
<td>1.08</td>
<td>1.06</td>
<td>1.10</td>
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<tr>
<td>Exercise Social Norms</td>
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<td>132.77***</td>
<td>1.15</td>
<td>1.13</td>
<td>1.18</td>
</tr>
</tbody>
</table>

*p < 0.05
***p < 0.001

[Excluded variables (p > 0.05): marital status, education, household size, income, age, ethnicity (Chinese, Filipino, Japanese, Native Hawaiian, White, other), and hours of television/day]

**Analysis for Hypothesis 2**

A statistically significant linear regression model was produced with $R$ significantly different from zero, $F(8, 3915) = 35.41, p < 0.001$. Table 3 shows the correlations between the variables, the standardized regression coefficients ($\beta$), the $t$ score, statistical significance, $R^2$, and $R^2$ change. The strongest predictors of MET-m per week were exercise social norms ($\beta = 0.13$) and exercise self-efficacy ($\beta = 0.11$). Overall, 6.6% of the variability in MET-m per week was predicted by the variables of gender, age, education, normal weight, Hawaiian ethnicity, sitting or standing m/day, exercise social norms, and exercise self-efficacy.
In this study investigating the relationship between physical activity and exercise self-efficacy and exercise social norms, both hypotheses were supported. Meeting walking recommendations and more weekly MET-m of physical activity were each predicted by higher exercise self-efficacy and higher exercise social norms scores. The probability of meeting walking recommendations improved 8-15% with a one unit increase in exercise self-efficacy and exercise social norms, respectively, with males being 20% more likely to meet walking recommendations than females. More weekly MET-m of physical activity were obtained by younger, normal weight, Hawaiian males who had fewer sitting or standing minutes per day and higher exercise social norms and exercise self-efficacy scores.

### Exercise Self-Efficacy

The finding that meeting walking recommendations was related to higher exercise self-efficacy is similar to previous research showing that people who had high self-efficacy for physical activity, despite obstacles, were more likely to engage in exercise behaviors (Kim, 2007). Again, self-efficacy was found to be a consistent psychosocial correlate of physical activity (Trost et al., 2002). Thus, a person’s belief in their ability to successfully exercise, i.e., exercise self-efficacy, is related to meeting walking recommendations and doing more minutes of physical activity per week.

### Social Norms for Exercise

The results from this study also provide a link between social norms and exercise behavior. Questions about behavioral social norms significantly predicted more weekly physical activity, including walking, extending previous research that found behavioral social norms to be related to meeting exercise recommendations (Eyler, Matson-Koffman et al., 2003) and to be a significant predictor of vigorous physical activity (Okun et al., 2003). It is interesting to note that even though the descriptive social norms questions used in this study specifically asked about walking, they were also predictive of total weekly physical activity. The specific nature of the questions did provide a link to physical activity behavior, unlike the questions asking about global social norms in a previous Hawaii study (Maddock et al., 2003).
Demographic Variables

Over half of survey participants met walking recommendations, with one-third of the sample reporting enough physical activity for health-enhancing benefits. While these results echo those previously found in Hawaii (52.4% meeting physical activity guidelines versus 48.1% nationally; CDC, 2005a, 2005b), it is encouraging to see one-third of the sample gaining health enhancing benefits from their exercise. Unlike previous research (Mampilly et al., 2005), White and Japanese participants walked more than Filipinos, Japanese participants did more moderate and vigorous physical activity than Native Hawaiians, and both Japanese and White participants were more likely to meet HEPA guidelines than Native Hawaiians. However, Native Hawaiian ethnicity was a significant predictor for total MET-m per week of physical activity.

Sedentary Behaviors

As previously shown by national data, in our sample, overweight and obese adults reported significantly more minutes of daily sedentary behavior than normal or underweight adults (McDowell et al., 2006). Fewer minutes of sitting or standing were significant predictors of meeting walking recommendations and more MET-m per week. This agreed with previous research on work activities where those who reported sitting or standing more were half as likely to be moderately active (Kruger et al., 2006). We found that males reported significantly more minutes of sitting or standing and watching television per day, but were more likely to meet walking recommendations and do more MET-m of physical activity per week than females. In fact, male gender was a statistically significant predictor for both physical activity outcomes. Buckworth and Nigg (2004) found similar results for college students where males spent more time in sedentary behaviors than did females, but also had higher levels of exercise than females. The relationship between television watching and physical activity has been debated (Jeffrey & French, 1998; Taveras et al., 2007), and our results show that the amount of television watching was not a statistically significant predictor for meeting walking recommendations or MET-m per week, but the sedentary behaviors of time spent sitting or standing were significant predictors. We recommend that research continue to define and investigate different types of sedentary behaviors as they seem to function independently depending on the behavior.

Limitations

While the survey collected data from a cross-section of Hawaii residents, it was conducted by phone. This meant that residents without landlines were unable to participate, because multi-modal data collection techniques (e.g., mailed surveys in conjunction with phone surveys) were not used. All data were self-reported and results may have differed if measured physical activity data were used.

The questions for social norms were asked about family, friends, and people known by the participant. It is possible that family members and friends were included by the participants in the people they knew, even though the questions were asked in an ordered sequence. It is possible that a re-wording of the questions may have produced different answers. Additionally, the questions used to collect data on exercise social norms were worded specifically for walking at recommended levels. While these questions still had predictive power for MET-m per week, it is possible that questions asking about other types of physical activity could have shown a stronger relationship. Future research should examine exercise social norms for moderate and vigorous physical activity. The generalizability of these findings and recommendations may be limited to areas with similar population demographics.

Applied Relevance and Future Directions

Both walking and overall physical activity were predicted by higher exercise self-efficacy and higher descriptive social norms for exercise. For practitioners, exercise and walking programs could be designed to work in small incremental and achievable steps building exercise self-efficacy for a desired physical activity, specifically including opportunities to experience performance accomplishments, vicarious experiences, and self-evaluation (Bandura, 1977). Exercise interventions should focus on populations that specifically contain women, overweight and obese adults, older adults, and those who frequently spend time sitting or standing. Marketing and outreach efforts could focus on these populations along with confidence enhancing messages and activities.

While it is possible that the males in our study simply had higher exercise self-efficacy than females, it is also possible that males and females may interpret sources of exercise self-efficacy differently (e.g., performance accomplishments, vicarious experiences, self-evaluation). Since gender differences for self-efficacy were also found within ethnicities, culturally appropriate activities may need to be differentiated between males and females with additional promotion efforts for females. These gender-ethnicity relationships should be explored further in future research, due to Hawaii’s large percentage of Asian residents (41.5% versus 4.3% nationally in 2005; US Census Bureau,
2007), the fastest growing ethnic group in the US in terms of percentage growth (Le, 2007). To optimize the various levels of physical activity among areas with very diverse ethnic groups, physical activity promotion activities should be culturally appropriate.

Efforts to change social norms are much harder and take longer. Social marketing campaigns are one way to address descriptive social norms by focusing on shaping healthy behaviors as the norm (Renaud, Bouchard, Caron-Bouchard, Dube, Maisonneuve, & Mongeau, 2006). During physical activity interventions, individuals should be introduced to other active people and possibly complete the intervention with a friend or family member to try to improve their immediate social norms for exercise. Additionally, future research should ask questions about descriptive social norms for moderate and vigorous physical activity, since we only asked about walking behaviors.

Future research should continue to investigate the convoluted relationship between sedentary behaviors and physical activity. It may be that the time spent in specific sedentary behaviors (e.g., on the computer, watching television) does not lead to less physical activity; it may have a curvilinear relationship. In conclusion, both exercise self-efficacy and social norms for exercise play a role in adult physical activity levels. Effective physical activity interventions should include both of these psychosocial variables.

References


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