Can Gender Make a Difference on the Relationship between Social-Cognitive Factors and Exercise Behavior among Thais?

Ornwanya Poomsrikaew 481

Background: In Thailand, incident and death rate of heart attack have increased every year in the last decade. Exercise is known to reduce the modifiable risk factors of heart attack; cholesterol, hypertension, obesity, and diabetes. The determinants of exercise need to be investigated among Thais in order to understand how to increase the adoption and maintenance of exercise behavior. The effect of gender role should be investigated when study the determinants of exercise behavior.

Objective: The purpose of this study was to examine the effect of gender on the relationship between social-cognitive factors and exercise behavior among Thai people.

Methods: A convenience sample of people aged 18 years or older (n = 618) was recruited from public locations in Thailand. The mean age was 37 ± 10.88 (18-68) and 51.6% were women. A descriptive cross-sectional design was used. Self-administered questionnaires measured: (a) demographics, (b) perceived risk of heart disease, (c) exercise outcome expectancies, (d) exercise self-efficacy, (e) intention to exercise, and (f) exercise behavior. The questionnaires were translated into Thai language using committee translation. Path models were estimated using AMOS 18.

Results: Outcome expectancies and perceived self-efficacy indirectly influenced exercise behavior via intention. Unexpectedly, perceived risk of heart disease did not contribute to the model. Between men and women, the final model for exercise behavior was significantly different ($\Delta\chi^2(5) = 10.155$, $p < 0.05$). Moreover, 41% of

intention and 25% of exercise behavior was accounted for in the women sample. In the men sample, 38% of the variance in intention and 10% of the variance in exercise behavior was accounted for. This evidences indicated that the model showed a better fit in the women than in men Conclusions: Interventions that enhance intention to exercise through outcome expectancies and perceived self-efficacy may be effective. Interventions may be more effective if they target particular gender groups.

Keywords: Perceived Risk, Outcome Expectancies, Perceived Self-Efficacy, and Intention Effects on Exercise Behavior in a Thai Population (traditionally low-exercise).

Introduction

The Health Action Process Approach (HAPA) is one model derived from the social cognitive theory that is used to explain how people adopt and maintain desired health behaviors (Schwarzer, 1992). The HAPA model is divided into the pre-intentional motivation phase and the post-intentional volition phase. In the first phase, intention is established by perceived risk, outcome expectancies, and perceived self-efficacy. The hypothesized causal order is from perceived risk to outcome expectancies to perceived self-efficacy (Schwarzer, 1992). Individuals who see themselves as vulnerable to disease are likely to engage in a healthy life (Renner, Knoll, & Schwarzer, 2000). Outcome expectancies help a person balance the pros and cons of a certain behavior and are seen as precursors of perceived self-efficacy (Schwarzer, 1992; Schwarzer, 2008). Perceived self-efficacy describes individuals' beliefs in their ability to perform an action. Perceived self-efficacy, outcome expectancies, and perceived risk significantly contribute to an intention (Renner, Universitat, & Shwarzer, 2003; Schwarzer, 1992).

The second phase (post-intentional volition) describes how hard people try to take action and how long they persist. This phase involves perceived self-efficacy and planning. Once established, intention has to transform into detailed instructions on how to perform the desired behavior. To initiate and maintain an action, the action has to be protected from distraction and from premature disengagement while people develop the new habit. Perceived self-efficacy establishes the amount of effort to invest and persist in performing behaviors.

Purpose

The purpose of the study was to examine the relationship of perceived risk, outcome expectancies, perceived self-efficacy, and intention on exercise behavior. Secondarily, the effects of gender on the relationship between social-cognitive factors and exercise behavior were examined.

Methods

A cross-sectional design was used in the study. A 618 convenience sample was recruited from public locations in Thailand: Udon Thani municipality government building and a public park.

Data Analyses

Path analysis using Amos 18 (Arbuckle, 2009) was conducted to examine the effect of variables. To determine gender as moderators, searcher pursued multiple group analyses or a nested model with equality constraints between two groups: men and women (Byrne, 2010; Tabachnick & Fidell, 2001).

Results

The baseline version of the hypothesized model (Figure 1), composed of exercise behavior as an endogenous variable; intention to exercise as a mediator; and perceived risk of heart disease, outcome expectancies, and perceived self-efficacy as exogenous variables, was estimated with the total sample (n = 618). The baseline model had GFI and CFI indices which were higher than 0.95 (GFI = 0.984 and CFI = 0.952). However, in the baseline model, the $\chi 2/df$ ratio was larger than 5 times the degrees of freedom, and RMSEA was higher than 0.05 ($\chi 2/df$ = 12.99; RMSEA = 0.139). Therefore, the baseline model was not a good fit with the data. The path of perceived risk of heart disease on intention was not significant in the baseline model (β = -0.02, $p < 0.573$). Thus, perceived risk of heart disease was removed from future models. The modified model was constructed, and the model fit and parameters were re-estimated. The modified model was composed of exercise behavior as an endogenous variable; intention as a mediator; and outcome expectancies and perceived self-efficacy as exogenous variables. The modified model fit the data well: χ^2 (1) = 1.288, p = 0.256; χ^2/df = 1.288; GFI = 0.999; CFI = 0.999; RMSEA = 0.022. A chi-square difference test revealed a significant improvement in the fit of the modified model: $\Delta\chi^2$ (1) = 24.691, $p < 0.001$. Hence, with perceived risk of heart disease removed, the modified model was more parsimonious and a better fit than

the baseline model. In the modified model, exercise was directly and significantly influenced by intention to exercise ($\beta = 0.27$, $p < 0.01$) and perceived self-efficacy ($\beta = 0.19$, $p < 0.01$) and explained 16% of variance in exercise. Intention to exercise was influenced by perceived self-efficacy ($\beta = 0.43$, $p < 0.01$) and outcome expectancies ($\beta = 0.34$, $p < 0.01$) and accounted for 39% of variance in intention to exercise.

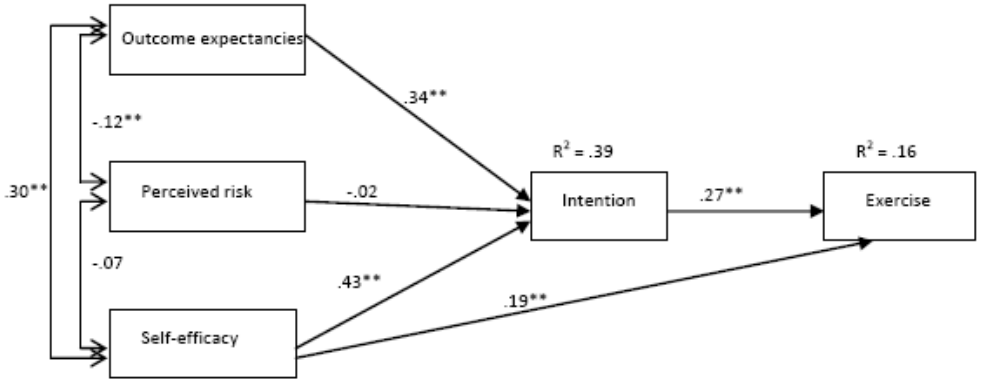

Figure 1. The baseline model for exercise behavior among Thais in Thailand.
*** P < .01.*

The modified model was used to examine different gender groups for the relationship between social-cognitive factors and exercise behavior. The exercise model was estimated separately for men and women. The model for men (Figure 2) was a good fit for the data: (χ^2 (1) = 1.249, p = 0.264; χ^2/df = 1.249; GFI = 0.998; CFI = 0.999; RMSEA = 0.029). The model for women (Figure 3) also had a good fit with the data: (χ^2 (1) = 0.040, p = 0.841; χ^2/df = 0.040; GFI = 1.000; CFI = 1.000; RMSEA = 0.000). The model of exercise behavior for women demonstrated a larger amount of variance in intention (41%) and in exercise (25%) when compared to variance in intention (38%) and in exercise (10%) in men. Between men and women, the modified model for exercise behavior was significantly different ($\Delta\chi^2(5) = 10.155$, $p < 0.05$). The single paths of perceived self-efficacy on exercise behavior ($\Delta\chi^2(1) = 5.782$, $p < 0.05$) and intention on exercise behavior ($\Delta\chi^2(1) = 4.620$, $p < 0.05$) were significantly different between men and women.

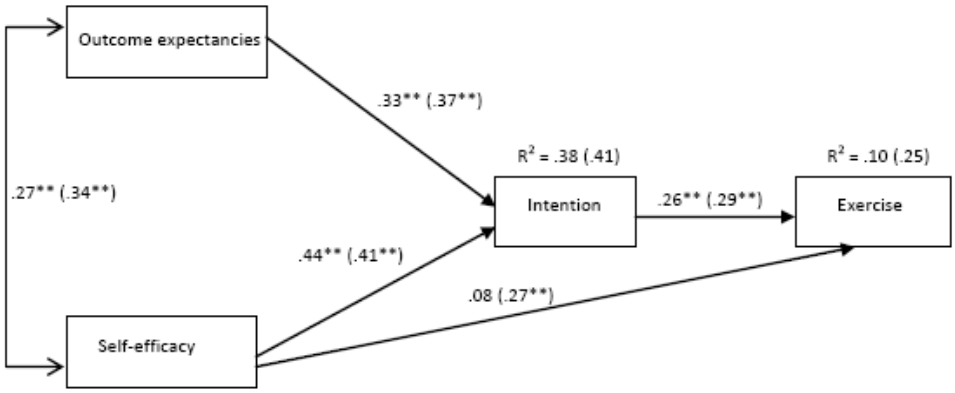

Figure 2. The comparison of the model for exercise behavior between men and women in Thailand (coefficients for women in parentheses).
*** P < .01.*

Discussion

In this study, exercise behavior was influenced by intention to exercise (as a mediator in the hypothesized model). This result is consistent with one prior study in Thailand (Jitramontree, 2003), one in South Korea (Renner et al., 2007), and many previous Western studies (Blanchard et al., 2008; Hoyt et al., 2009). These studies indicate that intention was an influence of exercise behavior across cultures. Therefore, intention should be addressed as a mediator in the processes of changing exercise behavior among a Thai population.

This study found that perceived self-efficacy was a direct significant predictor of exercise behavior which was also supported in other Thai studies with heart disease and hypertensive patients (Namphonkrung et al., 2005), undergraduate students (Srichaisawat, 2006), older adults (Anunsuksawat, 2006), and people recruited at a fitness center (Wongvilai, 2004). However, the effect of perceived self-efficacy on exercise behavior in the present study was somewhat lower than in previous Thai studies. The difference may be explained by those studies not including intention to exercise. Hence, including intention to exercise (as in this present study) may diminish the direct effect of perceived self-efficacy on exercise behavior.

This result is also similar to previous studies in the United States reporting that perceived self-efficacy was a significant predictor of exercise behavior among women (Choi et al., 2008; Wilbur et al., 2005) and older adults (Conn, Burks et al., 2003; Resnick & Nigg, 2003). However, contrasting findings were reported by Maglione and Hayman (2009): Perceived self-efficacy did not contribute to exercise behavior

among U.S. college students. This suggests that, in younger groups, exercise behavior may not be influenced by perceived self-efficacy.

This study, as well as previous studies, reported that intention to exercise was significantly influenced by outcome expectancies and perceived self-efficacy in Western countries (Conn, Tripp-Reimer et al., 2003; Sniehotta et al., 2005), in South Korea (Renner et al., 2007), and in Thailand (Jitramontree, 2003). Unexpectedly in this study, perceived risk of heart disease was not a significant predictor of intention to exercise even though perceived risk is an important variable within the HAPA model. However, a few previous studies have also found no relationship between perceived risk and exercise (Schwarzer et al., 2007; Schwarzer et al., 2008). It may possibly be due to measurement error or possibly that perceived risk may be less relevant in determining exercise intention or exercise behavior (Schwarzer et al., 2007). The Perception of Risk of Heart Disease Scale (PRHDS; Ammouri & Neuberger, 2008) used to measure perceived risk of heart disease was developed for Jordanian people in English. The measure might not be applicable in Thai culture. In this present study, the internal consistency reliability of two subscales of the PRHDS was low. In this study in Thai people, perceived risk of heart disease may be a challenging construct to capture because Thais may be unwilling to admit they are at risk because this may tempt fate (a cultural belief). Since this is the first study to pursue the effect of perceived risk of heart disease on exercise intention in Thailand, it is premature to conclude that perceived risk of heart disease did not play a role in contributing to exercise intention among these Thais.

The second purpose of the study was to examine the effects of gender on the relationship between social-cognitive factors and exercise behavior among Thais. In the current study, gender differences on the relationships between social-cognitive predictors and exercise behavior were found. The modified model for exercise showed a better fit in women than men. The present results are congruent with a prior study indicating that the model of dietary behavior among a South Korean sample was significantly different between men and women (Renner et al., 2008). The present study also reported that, for women, perceived self-efficacy and intention to exercise were more strongly associated with exercise than for men.

In conclusion, the modified HAPA model is more applicable for middle-aged/older adults and women rather than younger adults and men. The beliefs about outcome expectancies, perceived self-efficacy, and intention are predictors of exercise behavior. Exercise intervention programs for Thai population should incorporate outcome expectancies and perceived self-efficacy in order to impact intention to exercise. Thai people should be educated about the positive benefits of exercise, and the negative perceptions of exercise should be addressed. Improving individuals' ability to overcome barriers to perform exercise should be addressed. In promoting exercise behavior, it would be beneficial to consider gender-specific strategies as well.

References

Ammouri, A. A., & Neuberger, G. (2008). The perception of risk of heart disease scale: Development and psychometric analysis. *Journal of Nursing Measurement, 16*(2), 83-97.

Anunsuksawat, W. (2006). *Factors influencing to exercise behaviors of elder persons among Muang district Samutsakhorn province*. (Unpublished master's thesis). Christian University, Nakhon Pathom, Thailand.

Arao, T., Oida, Y., Maruyama, C., Mutou, T., Sawada, S., Matsuzuki, H., & Nakanishi, Y. (2007). Impact of lifestyle intervention on physical activity and diet of Japanese workers. *Preventive Medicine, 45*(2-3), 146-152.

Arbuckle, J. L. (2009). *Amos 18 user's guide*. Chicago, IL: Amos Development Corporation.

Blanchard, C. M., Kupperman, J., Sparling, P., Nehl, E., Rhodes, R. E., Courneya, K. S., . . . Rupp, J. C. (2008). Ethnicity and the theory of planned behavior in an exercise context: A mediation and moderation perspective. *Psychology of Sport and Exercise, 9*(4), 527-545.

Bureau of Policy and Strategy. (2009). *Number of deaths and death rates per 100,000 population by leading causes of death 2003-2007.* Retrieved January 23, 2009, from http://bps.ops.moph.go.th/index.php?mod=bps&doc=5

Byrne, B. M. (2010). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* (2nd ed.). New York, NY: Taylor & Francis Group.

Choi, J., Wilbur, J., Miller, A., Szalacha, L., & McAuley, E. (2008). Correlates of leisure-time physical activity in Korean immigrant women. *Western Journal of Nursing Research, 30*(5), 620-638.

Conn, V. S., Burks, K. J., Pomeroy, S. H., Ulbrich, S. L., & Cochran, J. E. (2003). Older women and exercise: Explanatory concepts. *Women's Health Issues, 13*(4), 158-166.

Conn, V. S., Tripp-Reimer, T., & Maas, M. L. (2003). Older women and exercise: Theory of planned behavior beliefs. *Public Health Nursing, 20*(2), 153-163.

Hoyt, A. L., Rhodes, R. E., Hausenblas, H. A., & Giacobbi, P. R. (2009). Integrating five-factor model facet-level traits with the theory of planned behavior and exercise. *Psychology of Sport and Exercise, 10*(5), 565-572.

Jitramontree, N. (2003). *Predicting exercise behavior among thai elders: Testing the theory of planned behavior*. (Unpublished Doctoral dissertation). University of Iowa, (2005065994)

Maglione, J. L., & Hayman, L. L. (2009). Correlates of physical activity in low income college students. *Research in Nursing and Health, 32*(6), 634-646.

Ministry of Public Health. (2008). In Petcharien N., Sensathien S. (Eds.), *The survey report of behavioral risk factors of non-communicable disease and injuries 2007*. Nonthaburi: The War Veterans Organization of Thailand.

Namphonkrung, P., Jitpanya, C., & Lueboonthavatchai, O. (2005). Factors related to exercise behavior in coronary artery disease patients . *Journal of Nursing Science Chulalongkorn University, 17*(2), 97-110.

Renner, B., Kwon, S., Yang, B., Paik, K., Kim, S. H., Roh, S., . . . Schwarzer, R. (2008). Social-cognitive predictors of dietary behaviors in South Korean men and women. *International Journal of Behavioral Medicine, 15*(1), 4-13.

Renner, B., Spivak, Y., Kwon, S., & Schwarzer, R. (2007). Does age make a difference? predicting physical activity of South Koreans. *Psychology & Aging, 22*(3), 482-493.

Renner, B., Universitat, G. E., & Shwarzer, R. (2003). Social-cognitive factors in health behavior change. In J. Suls, & K. A. Wallston (Eds.), *Social psychological foundations of health and illness* (pp. 169-196). Malden: Blackwell Publishing.

Schwarzer, R. (1992). Self-efficacy in the adoption and maintenance of health behaviors: Theoretical approaches and a new model. In R. Schwarzer (Ed.), *Self-efficacy: Thought control of action* (pp. 217-241). Washington: Hemisphere Publishing Corporation.

Schwarzer, R. (2008). Modeling health behavior change: How to predict and modify the adoption and maintenance of health behaviors. *Applied Psychology: An International Review, 57*(1), 1-29.

Schwarzer, R., & Renner, B. (2000). Social-cognitive predictors of health behavior: Action self-efficacy and coping self-efficacy. *Health Psychology, 19*(5), 487-495.

Schwarzer, R., & Renner, B. (2008). *Health-specific self-efficacy scales*. Retrieved March 31, 2009, from http://userpage.fu-berlin.de/~health/healself.pdf

Schwarzer, R., Schuz, B., Ziegelmann, J. P., Lippke, S., Luszczynska, A., & Scholz, U. (2007). Adoption and maintenance of four health behaviors: Theory-guided longitudinal studies on dental flossing, seat belt use, dietary behavior, and physical activity. *Annals of Behavioral Medicine, 33*(2), 156-166.

Schwarzer, R., Ziegelmann, J. P., Luszczynska, A., Scholz, U., & Lippke, S. (2008). Social-cognitive predictors of physical exercise adherence: Three longitudinal studies in rehabilitation. *Health Psychology, 27*(1), S54-63.

Sniehotta, F. F., Scholz, U., & Schwarzer, R. (2005). Bridging the intention-behaviour gap: Planning, self-efficacy, and action control in the adoption and maintenance of physical exercise. *Psychology & Health, 20*(2), 143-160.

Sniehotta, F. F., Scholz, U., Schwarzer, R., Fuhrmann, B., Kiwus, U., & Voller, H. (2005). Long-term effects of two psychological interventions on physical exercise and self-regulation following coronary rehabilitation. *International Journal of Behavioral Medicine, 12*(4), 244-255.

Srichaisawat, P. (2006). Factors affecting exercise behaviors of undergraduate students, Srinakharinwirot university. *Journal of Faculty of Physical Education, 9*(2), 5-18.

Tabachnick, B. G., & Fidell, L. S. (2001). Cleaning up your act: Screening data prior to analysis. In B. G. Tabachnick, & L. S. Fidell (Eds.), *Using multivariate statistics* (4th ed., pp. 56-110). Needham Heights, MA: Allyn and Bacon.

Wilbur, J., Vassalo, A., Chandler, P., McDevitt, J., & Miller, A. M. (2005). Midlife women's adherence to home-based walking during maintenance. *Nursing Research, 54*(1), 33-40.

Wongvilai, N. (2004). *Psychological factors affecting the continuing exercise behavior of customers at Nalinrut fitness center*. (Unpublished master's thesis). Kasem Bundit University, Bangkok, Thailand.