CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

This chapter is organized into four sections: findings and conclusion, implication of findings, limitations, and recommendations for further research.

Findings and Conclusion

Research to identify appropriate strategies for testing the effective intervention of osteoporosis preventive behavior for Thai older adults has not been documented. This is the first published study focused upon the development of a feasible and acceptable osteoporosis prevention program to improve health outcomes for Thai older adults.

Participants participating in this study were recruited at the HPCE, Faculty of Nursing, Chiang Mai University, where the program was set up with three phases: the pre-treatment; the treatment; and the treatment effect.

The pre-treatment phase was designed to collect the preliminary data including personal data and main outcome data before the intervention was implemented. The main outcomes were evaluated by using the FOOQ, OHBS, OSES, the Dietary Calcium Food-Frequency Questionnaire, and the Pedometer Record Form.

At the treatment phase, the intervention, namely the JHBP, was carried out by the investigator. This program offered three components of intervention including a booklet, pamphlets, and a 6-month intervention. The 6-month intervention was composed of three elements: a 4-week class session; screening of bone mass at the

calcaneous; individual or small group counseling.

The treatment effect phase was planned to evaluate changes in knowledge, health beliefs, and self-efficacy associated with osteoporosis at the immediately after class, 3, and 6-months after enrollment, and a change in osteoporosis preventive behavior at 3 and 6-months after enrollment. These changes were investigated by using the same instruments measuring the main outcomes as mentioned in the pre-treatment phase.

Results of this study are summarized as follows:

1. Of 51 participants who completed class sessions, 48 individuals completed follow-up measures. These participants were predominantly women. A majority of these participants did not have any of disease although about a half of participants have had severe low bone mass at the calcaneous. Few participants had risk behaviors associated with osteoporosis including caffeine and alcohol consumption, family history, and sedentary lifestyle.
2. The feasibility and acceptability of the program for the prevention of osteoporosis for Thai older adults in this study were supported based on the evidences including: 1) a low drop-out rate, 2) reasonable time required for completing outcome measures, 3) minimal problems during program implementation, and 4) the participants' high ratings of the program acceptability.
3. The program was successful in producing observable changes in knowledge, health beliefs, and self-efficacy associated with osteoporosis of participants at the immediately after class, 3 and 6-months after enrollment. Osteoporosis knowledge and self-efficacy were significantly increased over time, while an

increasing of health beliefs was supported for subscales of perceived susceptibility and perceived benefits of exercise. Clearly, perceived barriers of exercise and calcium intake were significantly decreased over time.

4. Change in osteoporosis preventive behavior was observable in the participants after receiving the intervention. The participants reported increasing calcium intake from the baseline compared to 3 and 6-months after enrollment. Walking exercise has increased from the baseline to 3-month and from the baseline to 6-month after enrollment. However, it was surprising to note that there was a decrease of walking exercise from 3-month to 6-month after enrollment, but this evidence was not statistically significant.
5. When calcium intake at the baseline was assigned as a covariate, older adults with severe low bone mass were more likely to improve calcium intake than those with normal or low bone mass while participants with severe low bone mass decreased walking exercise from 3-month to 6-month after enrollment. However, the decrease in walking exercise was not statistically significant.

In conclusion, this study set out to determine if an osteoporosis prevention program was feasible and acceptable for Thai older adults in behavior modification, and which could possibly prevent osteoporosis or retard bone loss. In this context, the program was successful.

Implication of Findings

Generally, human behavior is multifaceted, and not easily explained nor modified. Osteoporosis is a silent disease resulting in health problems in older adults.

Health care providers, therefore, need to be increasingly involved in finding better ways for osteoporosis prevention. Calcium intake and weight-bearing exercise are viable strategies to osteoporosis prevention. As these two strategies were emphasized in the intervention in this study, results come out from this study could be provided for either nursing practice or nursing education.

For nursing practice, the older adults in this study reported not having enough knowledge on osteoporosis at the baseline assessment, especially risk factors. On the other hand, older adults in this study markedly increased their osteoporosis knowledge and changed their preventive behavior although the association between osteoporosis knowledge and calcium intake and walking exercise behavior in this study was not investigated. Therefore, it is a critical issue that nurses need to be concerned about educating at risk people so they have enough knowledge and understanding about osteoporosis and its consequent problems at both health care offices and other health care settings.

Another implication for practice is that nurses should provide written culture age appropriate educational materials as well as offer risk reduction counseling for behavioral change. Counseling, which provided in this study as a booster dose of intervention gave a chance for the older adults to discuss and address individual's barriers to health practice behavior. Also, another implication for nursing practice is that nurses should offer or refer at risk older adults for bone mass screening. Discussion of the screening results may produce a positive change in behavior, particularly calcium intake behavior. Additionally, nurses should encourage older adults to use a calendar to remind them of exercising; this allows the older adults to

visualize their walking successes and to see their ability in completing their walking exercise goals. Specific advice about avoidance of falls should be presented.

Evidence from post interviews suggested that there were some barriers of calcium intake as well as of walking exercise. Older adults might understand their susceptibility of osteoporosis, but they still fail to appreciate the long-term preventive practice of osteoporosis. Therefore, one important implication for nursing practice is that nurses should provide regular reinforcement regarding positive behavioral changes to at risk people, particularly by using strategies enhancing self-efficacy.

In relation to nursing education, staffs of the health centers are important factors to support the health promotion, disease prevention, and self-care for older adult. Based on findings from this study that older adults participating at the baseline assessment had insufficient knowledge about osteoporosis, Faculty of Nursing should take responsibility for initiating or strengthening health center capacity in educating as well as counseling about osteoporosis to older adults. As some older adults in this study were confused about osteoporosis and osteoarthritis, this suggested nurse educators should educate them about osteoporosis and osteoarthritis since this confusion may be linked to suboptimal behavior choices.

Limitations

The results of this study should be interpreted with the understanding that there were some study limitations.

1. The findings cannot be generalized to men since most adults participating in this study were women. Although aggressive recruitment was used, it was not possible to attract sufficient numbers of older men.

2. One limitation has to do with the motivation level of study population. Participants were attending the HPCE so they may be more motivated to respond to an osteoporosis prevention program than those who did not attended the HPCE.
3. Another potential limitation has to do with the overall assessment of preventive behavior changes. For example, dietary calcium intake was evaluated by self-report; the accuracy of dietary calcium intake report may be limited.
4. Changes in other risk factors related to life styles including smoking, caffeine, and alcohol consumption were not examined.
5. The observations concerning the effects of the program on behavioral changes are speculative since the lack of a control group makes it impossible to make causal inferences.

Recommendations for Further Research

Older adults, who are at risk for developing osteoporosis as well as other common chronic conditions, need to increase responsibility for their own health and change risk behaviors into healthy behavior so that one can improve health and reduce the likelihood of subsequent problems. Based on the findings of this study, several recommendations are appropriate.

1. Since this program could raise awareness of osteoporosis prevention through increase in knowledge, health beliefs, and self-efficacy associated with osteoporosis, which led to observable changes in osteoporosis preventive

behavior, a recommendation is to extend the research by testing the intervention in a large senior center study

2. Walking decreased at 6-month after enrollment, a recommendation is to determine if the changes in osteoporosis preventive behaviors persist for longer than 6 months, and if the changes in osteoporosis will contribute to improving bone mass conditions.
3. Another recommendation is to design a study in which a larger sample size is recruited to distinguish which intervention, between information alone and information and bone mass screening, has larger impact on osteoporosis preventive behavior of Thai older adults.
4. There is a possibility this program may work differently in men. Men are also susceptible to osteoporosis; a recommendation is to study the impact of the program on men.
5. Since there were few men participated in the study, a recommendation is to develop recruitment strategies to target males like having a male research assistant.
6. Pedometers represent an acceptable and feasible way of objectively and continuously monitoring walking. Older adults were very pleased with using when they walked, and more importantly the pedometers improved older adult adherence to daily walking. Therefore, a recommendation is to incorporate pedometers into the intervention to encourage older adults to engage in walking exercise.
7. Another recommendation is that osteoporosis educational prevention program aimed to encourage older adults to adopt appropriate behavior to

prevent osteoporosis is not only meaningful content, but practical as well. The context, which should be emphasized when setting up the program, are time, settings, and measures. Older adults in this study mentioned that they enjoyed attending class session in the morning when they were fresh. In addition, the health care setting, which they preferred, was one that they could easily access. Also, they were generally pleased with questionnaires limited to no more than three possible choices for each item.

8. Results from post-interview guides suggested that family members were partly involved in health practice of older adults; further study is needed to determine if there will be better changes in osteoporosis preventive behavior when family support is incorporated into the osteoporosis prevention intervention program.
9. Older adults with secondary school and higher education spent less time to complete questionnaires, compared with those with primary school education; a recommendation is that readability should be one issue concerning when conducting a study on older adults.
10. Another recommendation is that more research is conducted that combine HBM and SE as frameworks. It was not new notation, however, since findings from this study suggested that HBM incorporated with SE provided a powerful approach to influencing osteoporosis preventive behavior.

In conclusion, the JHBP program provided older adults with a skill that encouraged them to incorporate health education activity into their daily lives. Changes of risk behavior into preventive behavior may help augment the quality of life in older adults who are particularly at risk for developing osteoporosis.