Effect of Personal Health Record Booklet (PHRB) to Knowledge, Self-Efficacy and Healthy Behaviors among Thai Population at Risk of Cardiovascular Disease (CVD)

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Objective: To investigate an effect of a personal health record booklet (PHRB) to knowledge, self-efficacy and healthy behaviors among Thai population at risk of CVD.

Material and Method: The present study was a quasi-experimental study conducted in a primary care unit during November 2008 and January 2009. A random sample of 204 CVD risk population were recruited as a comparison group (n = 102), who received a regular follow-up and recorded routine blood pressure using booklet and an experimental group (n = 102), who received the regular follow-up and the intervention consisting of health education for CVD information and self-monitoring practice. Data were collected by using self-administered questionnaires at the baseline, the 4th week and the 8th week. These data were analyzed by descriptive statistics, Chi-square test and GLM repeated measures.

Results: Knowledge score was significantly decreased although self-efficacy was increased over a time in the experimental group. However, except the figure of sweet/cookies consumption, the mean score of healthy behaviors were not improved in the experimental group when compared to the comparison group.

Conclusion: CVD information, activity illustrations with caption, health record section and daily self-monitoring tables in desired behaviors should be considered for inclusion in the booklet.

Keywords: Personal health record booklet, Self-efficacy, Thai population, Cardiovascular disease

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Personal health record booklet (PHRB) has been used as a potential cost of effective intervention in promoting healthy behaviors. It had been integrated with clinical management, among ill people and a population at risk for many years[1,2]. Some booklets were used for medical record[3,5] and some booklets provide space to record people’s behaviors[6]. It was recommended that the effective booklet should contain disease information, its prevention, desired behaviors, screening information and self monitoring[7-11]. This was consistent to a number of studies, in which it was reported that people who received booklets with more detailed information, significantly improved their knowledge[1,4,6,7,11] and tended to change their behavior[1,2,4,6,12,13].

In Thailand, the booklets for population at risk of cardiovascular disease (CVD) have usually been used in a form of health record for health professionals to monitor patients’ blood pressure and blood tests. Brief health knowledge and recommended behaviors regarding dietary consumption and physical activities were distributed on separate fliers if it was needed. There was no report of using a personal health record booklet, which included disease information, medical or health record and its effects within Thai population.

Self-efficacy is a potential factor, which related to taking an action. People with a tenacious belief in their capabilities will confide to initiate and persist in their actions despite innumerable difficulties[14]. Several studies on chronic diseases, which promoted people’s efficacy in performing desired behaviors by providing written health educational materials, reported that the individual behavior was changed[15-18]. The impact of a structured booklet on people’s self-efficacy
in performing healthy behaviors among Thai population is still unknown.

The purpose of the present study was to determine the effect of the PHRB to knowledge, self-efficacy and healthy behaviors within Thai population at risk of CVD. The healthy behaviors of the present study included no smoking, no drinking, taking daily vegetable diet and fruit consumption, the consumption sweets or cookie that was less than or equal to three times per day and practicing regular physical activities.

Material and Method

Study design

A quasi-experimental research design was used to investigate the effect of the PHRB conducted between November 2008 and January 2009. The recruitment of subjects was done by health professionals, who worked at a primary care unit in Suphanburi province, the central region of Thailand. Mahidol University’s Ethical Committee approved the present study with the approval number MUPH2008-166. Participants were fully explained before participating in the present study. Participation in the present study was voluntary. The informed consent was obtained and anonymity was guaranteed. The present study was conducted under the concept of Declaration of Helsinki.

Subjects

In the present study, participation was voluntary. The inclusion criteria were people aged 40 years and older and had had at least one risk factor of CVD including (1) a family history of diabetes mellitus, CVD, or hypertension, (2) smoking, (3) drinking, (3) blood sugar ≥ 100 mg/dl, (4) low HDL, (5) BMI > 23 kg/m², (6) waist circumference 90 centimeters in male and 80 centimeters in female and (7) a primary diagnosis of diabetes mellitus, high blood pressure or high cholesterol19-21).

Power analysis was conducted estimating the sample size needed for the present study. To achieve 80% power with a medium effect and an alpha of 0.05, a minimum of 130 participants (65 participants per group accounting for attrition) was projected22. In the present study, however, all CVD risk population in the setting, which was approximately 240 people, was included in the present study. After excluding people with too ill (n = 10), inconvenience to participate in the present study (n = 10), missing age (n = 16) and thus, there were 204 participants (102 participants per group) were invited to participate in the present study.

Procedure

When the participants were enrolled, they were simple randomly assigned into the comparison and experimental groups. For the comparison group, participants were usually asked to visit the hospital once a month (Monday and Wednesday) and receive follow-up and the leaflet regularly over the eight-week period of the present study. Information in the booklet was developed by health professionals, who were working at the primary care unit, included only blood pressure record and visiting schedule. For the experimental group, participants were also asked to visit the hospital once a month (Tuesday and Thursday) until the finishing time of the present study. Initially, they received a usual healthcare follow-up, which was supplemented by the PHRB. PHRB was developed by the researcher. Then, health education regarding CVD information and healthy behaviors are as indicated in the booklet and brief explanation of how to use the booklet and how to record such behaviors were also provided to participants directly from health professional, who was trained by the researcher. Participants in the experimental group were encouraged to practice items as indicated in the PHRB and asked to check their activities in the PHRB every day and then submitted the PHRB to the health professional at 4th and the 8th week.

Intervention

Health education

CVD information, a brief explanation of PHRB, and the instruction of how to use PHRB were provided.

Personal health record booklet

The information in the booklet consisted of three sections, namely, the health education section, the health record section and self-monitoring section. The health education section encompassed the health information of CVD, recommended behaviors, food menus and their calories. Illustrations of exercise procedures with captions were also provided. The health record section included the information on participant body weight, height, blood pressure, blood sugar, total cholesterol, LDL, HDL, waist circumference, medication if needed and professional advice. For self-monitoring section, tables were provided for recording self-monitored behaviors such as smoking, drinking, dietary intake and physical activities. The dietary intake record of booklet focused on consumption of red meat, fruits, vegetable and sweets or cookie, which is equal or less than 3 times per day, whereas physical activities
were defined as aerobic exercise or brisk walking(23).

Development of booklet

The PHRB was developed by the researcher in the light of the literature reviews on developing patient booklets(3,6,9,24,25). The size, the amount of included information, the ease of understanding, illustrations and captions were assessed by 3 experts including a physician, a nurse and a nutritionist prior to the beginning of the present study. The feasibility and readability of the present study booklet were tested with five people, who were at risk of CVD. The pilot test showed that the information were clear, although the font size was small. Therefore, the font size was increased for better readability. The booklet came in portrait format and was produced on a half of A4 size white paper. All information in the booklet was written at a grade of 10-12 level.

Questionnaire

Participants were asked to complete questionnaires at the time of enrollment, at the 4th and the 8th week. The questionnaires included the following:

The health knowledge questionnaire consisted of 12 items with assessed knowledge regarding CVD information. It included risk factors, dietary and physical activities. An overall score was calculated by counting the responses taken to get correct, with a total possible score ranging from 0-12. The higher the scores, the greater they have knowledge of CVD information and disease prevention.

Self-efficacy measured the present study population’s belief in their abilities to perform healthy lifestyle behaviors such as physical activities and recommended dietary intake. The 5-point Likert scale consisted of 9 items ranging from “1 = absolutely not confident” to “5 = absolutely confident” and the total possible score ranging from 9 to 45. The higher the scores, the greater confidence of individual performed healthy lifestyle. Reliability, which was measured by Cronbach’s alpha, was 0.7.

Healthy behaviors questionnaire measured six behaviors. It included no smoking, no drinking, number of vegetable serving, number sweets or cookies serving, fruit serving less than or equal to 3 times per day and physical activities more or equal to 30 minutes per day. All items had then provided a total score. All the answers were given on a 5-point Likert scale (everyday, 5-6 days, 3-4 days, 1-2 days and not at all), for which the score ranged from 1-5. The higher the score, the better the healthy behaviors were performed.

Statistical analyses

Data were analyzed by using the computerized statistical analysis software. Intention-to-treat analyses were used. Differences between the experimental and comparison group were examined by using Chi-square test for categorical and independence t-test for continuous variables. GLM repeated measures was performed to compare between groups so as to determine, whether there were significant changes in the health knowledge, self-efficacy and healthy lifestyle behaviors scores across time based on effect of the intervention. A p-value < 0.05 was considered as the criterion of statistical significance.

Results

Socio-demographic characteristics

A baseline comparison of two groups on age, marital status and educational level showed no statistically significant differences (p = 0.26, 0.28 and 0.65 respectively). Most of the participants in both groups were elderly, married women and finished at primary school level. However, participants in the comparison group had higher income and were still working compared to those in the experimental group (p < 0.001). No statistically significant baseline differences in BMI (p = 0.13) and clinical diagnosis including hypertension, diabetes mellitus and hypercholesterolemia was observed (p = 0.13, 0.78 and 0.07 respectively) (Table 1). Mean scores of knowledge, vegetable serving and physical activities in the experimental group were higher than those in the comparison group at the baseline (p = 0.03, 0.02 and < 0.001 respectively) (Table 2).

After adjusting for occupation and family income, the results from GLM showed statistically significant effects of time and the intervention to knowledge (F = 3.19, p = 0.01) and self-efficacy (F = 3.56, p = 0.01), as shown by the within-subjects tests (Table 3). When performing independent t-test analysis to compare the mean differences of knowledge, self-efficacy and healthy behaviors between groups, a significant difference in mean score of health knowledge between baselines to 8th week (p < 0.001) and between 4th week to 8th week of the present study (p < 0.001) and a significant difference in mean score of sweet or cookies consumption between baseline and the 4th week (p = 0.03) were observed. In addition, the mean score of self-efficacy was more likely to increase between baseline to 8th week (p = 0.05), but not significant (Table 4).

On average, the experimental group had greater self-efficacy in performing healthy behaviors,
better sweet/cookies consumption and less knowledge in CVD compared to the comparison group. It was interesting to note that health knowledge was declined over time in both groups.

**Discussion**

The PHRB can improve self-efficacy in CVD at risk people over the time. Possibly, it might be that the booklet consisted of not only disease information, but also brief descriptions of the recommended behaviors and illustrations with captions on performing such behaviors. This might have led participants to feel more confident in steps to perform activities, which is consistent with the findings that sweet or cookies consumption was reduced in the experimental group. According to Bandura\(^{(14)}\), individuals who confide in their capabilities are more likely to initiate and persist in their actions despite innumerable difficulties. Other behaviors-dietary consumption and exercise-could perhaps require more practice before they become new, healthier habits.

Effect of the PHRB was also noted in knowledge, but in the negative response, which is inconsistent with previous studies\(^{(1,2,26)}\). This statistical significant finding, in which occupation and family income were controlled for, may suggest an influence of employment status and household income on the degree of people’s knowledge. In general, poor people

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**Table 1.** Sociodemographic characteristics of participants at the baseline

<table>
<thead>
<tr>
<th></th>
<th>The comparison group (n = 102)</th>
<th>The experimental group (n = 102)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Male</td>
<td>33 (55.0)</td>
<td>27 (45.0)</td>
<td>0.36</td>
</tr>
<tr>
<td>Female</td>
<td>69 (47.9)</td>
<td>75 (52.1)</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>18 (51.4)</td>
<td>17 (48.6)</td>
<td>0.26</td>
</tr>
<tr>
<td>50-59</td>
<td>40 (57.1)</td>
<td>30 (42.9)</td>
<td></td>
</tr>
<tr>
<td>60 years and older</td>
<td>44 (44.4)</td>
<td>55 (55.6)</td>
<td></td>
</tr>
<tr>
<td>Min-Max = 40-94; Mean (SD)</td>
<td>60.1 ± 11.9</td>
<td>62.6 ± 12.3</td>
<td></td>
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<tr>
<td>Marital status</td>
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<tr>
<td>Single</td>
<td>29 (56.9)</td>
<td>22 (43.1)</td>
<td>0.28</td>
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<tr>
<td>Married</td>
<td>73 (43.1)</td>
<td>79 (52.0)</td>
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<tr>
<td>Education</td>
<td></td>
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<tr>
<td>No education</td>
<td>19 (52.8)</td>
<td>17 (47.2)</td>
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<td>Primary school</td>
<td>79 (48.8)</td>
<td>83 (51.2)</td>
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<td>2 (33.3)</td>
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<tr>
<td>Occupation</td>
<td></td>
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<tr>
<td>Employed</td>
<td>72 (55.8)</td>
<td>57 (44.2)</td>
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<tr>
<td>Unemployed</td>
<td>30 (40.0)</td>
<td>45 (60.0)</td>
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<tr>
<td>Family income (Baht)</td>
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</tr>
<tr>
<td>Less than 10,000</td>
<td>34 (44.7)</td>
<td>42 (55.3)</td>
<td>&lt; 0.001**</td>
</tr>
<tr>
<td>10,000-49,999</td>
<td>34 (72.3)</td>
<td>13 (27.7)</td>
<td></td>
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<tr>
<td>50,000 and up</td>
<td>1 (20.0)</td>
<td>4 (80.0)</td>
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<tr>
<td>Min-Max = 1,500-80,000;</td>
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<tr>
<td>Median</td>
<td>10,000</td>
<td>6,000</td>
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<tr>
<td>BMI (kg/m²)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Less than 23</td>
<td>44 (57.9)</td>
<td>32 (42.1)</td>
<td>0.13</td>
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<tr>
<td>23-27.49</td>
<td>33 (41.8)</td>
<td>46 (58.2)</td>
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<tr>
<td>27.5 and up</td>
<td>16 (51.6)</td>
<td>15 (48.4)</td>
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<tr>
<td>Diseases</td>
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<tr>
<td>Hypertension</td>
<td>75 (47.2)</td>
<td>84 (52.8)</td>
<td>0.13</td>
</tr>
<tr>
<td>Diabetes</td>
<td>45 (48.9)</td>
<td>47 (51.1)</td>
<td>0.78</td>
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<tr>
<td>Hypercholesterolemia</td>
<td>25 (40.3)</td>
<td>37 (59.7)</td>
<td>0.07</td>
</tr>
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</table>

* p < 0.05, Chi-square test, ** p < 0.001

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often dropped out from school and worked, resulting a low level of education in this group. This was supported by the studies of Butow et al(7) and DeWalt et al(27), which demonstrated that people with a low literacy level had less health-related knowledge and Lowry et al(28) study that education was associated to people's knowledge of healthy behavioral patterns.

Except the consumption of sweet or cookies, healthy behaviors were not improved by the PHRB. Possibly, it might have an influence of socio-demographic characteristics of the participants. A number of studies reported an influence of sex, income, educational level and occupation on people’s environment and their socialization experience. For example, Adler et al(29) reported that lack of physical activities was found more in women compared to that of men. Lantz et al(30) and Lowry et al studies(28) found that a low income was associated to unhealthy behaviors such as heavy drinking and physical inactivity. In addition to this, Pappas(31) reported that the poor and low educational level can mediate people’s abilities to afford healthy environments and at the knowledge of healthy behavior patterns.

The present study had strengths and limitations. The strength was the large sample size for testing an effectiveness of the booklet. Moreover, the structure of the PHRB was developed according to the recommendation from literature reviews. However, the study findings should be considered in the light of several limitations. Firstly, the majority of participants were elderly, which was less likely to have less health-related knowledge and change behaviors(7,30). Next, participants were recruited from people who were followed-up at one primary care unit that might have some contamination in the present study intervention. Finally, the duration of intervention might be short to investigate the effect of the intervention to see significantly different changes in people’s cognition.
to comprehend health information, self-efficacy and healthy behaviors.

Conclusion

People’s CVD knowledge and healthy behaviors was not improved by the PHRB, whereas their self-efficacy was more likely to increase overtime after receiving the study intervention. There was no significant difference in healthy behaviors, except sweet/cookies consumption, between participants who received the PHRB and those who did not.

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Potential conflicts of interest

None.

References


ผลของสมุดบันทึกสุขภาพส่วนบุคคลต่อความรู้ การรับรู้ความสามารถของตนเองและพฤติกรรมสุขภาพในประชากรไทยกลุ่มเสี่ยงโรคหัวใจและหลอดเลือด

ป้ายณิช ภักดีภู Introduction, วันเพ็ญ แก้วปาน, พิมพ์สุรางค์ เตชะบุญเสริมศักดิ์

วัตถุประสงค์: เพื่อศึกษาประสิทธิผลของสมุดบันทึกสุขภาพส่วนบุคคลในการส่งเสริมความรู้ การรับรู้ความสามารถของตนเองและพฤติกรรมสุขภาพในประชากรไทยกลุ่มเสี่ยงโรคหัวใจและหลอดเลือด

วัสดุและวิธีการ: การศึกษาเป็นการศึกษาเกี่ยวกับผลของการศึกษาการวัดความรู้และการรับรู้ความสามารถของตนเองและการใช้สมุดบันทึกสุขภาพส่วนบุคคลในกลุ่มเสี่ยงโรคหัวใจและหลอดเลือด

ผลการศึกษา: ผลการศึกษาให้เห็นว่ากลุ่มทดลองมีการรับรู้ความสามารถของตนเองเพิ่มขึ้นอย่างมีนัยativity แต่סטרีม์เทียบกลุ่มควบคุมไม่แตกต่างกัน

สรุป: สมุดบันทึกสุขภาพส่วนบุคคลมีการใช้เพื่อเพิ่มความรู้และความรู้และความเข้าใจในพฤติกรรมสุขภาพที่มีความรู้สึกและให้การบันทึกสุขภาพจัดการสุขภาพของตนเองได้