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Abstract: The recent health screening for metabolic diseases in Thai workers, Bangkok reported that health behavior of workers aged 25-59 years were at risk overweight. Objectives: (1) To evaluate managing for health behavioral modification program (HBMP) of non-governmental organizations (NGOs), (2) to compare behavior change and biochemical indicators between before and after program, and study factors affecting program success and barrier to the program implementation. Materials and Methods: Totally, there were 8 HBMPs conducted by NGOs between May, 2009-January, 2010. A sample of 3414 participants who were at risk for metabolic diseases. The study instruments were developed based on CIPP Model to collect data during program from 3 groups of respondents, including 8 program leaders, 8 administrators of program leaders, and some participants and health behavior questionnaires for assessing behavior change from the sample. Results: Opinions on the context, input, process, and product (CIPP) were at the good to very good level in total among 3 groups of respondents; including program leaders, administrators of program leaders, and participants. In addition, the factors affecting program success were a budget from the National Health Security Office, high potential staff, awareness and willingness of participants, cooperation of participants, activities relevant to lifestyles of participants, provision of ongoing information, good relationship between program leaders and participants, motivation and rewards for participants. Barriers to the program implementation included participants drop out from the program due to work load, unawareness about their health problem, and insufficiency of budget. After participating in the program, health behaviors of the participants (in self-efficacy, self-regulation, and self-care) were statistically significantly higher than before their participation, with p-value at 0.05 level. The participants had demonstrated an improvement in some health indicators: BMI, systolic blood pressure, and waistline measurement. These indicators were statistically significantly lower in comparison with pre-intervention data, with p-value at 0.05 level. Conclusions: HBMPs conducted by NGOs were successful and effective at improved health behaviors and decreased in biochemical indicators.

Key words: Behavioral modification, metabolic disease, CIPP model, health behavior, program evaluation.

1. Introduction

The recent health screening for metabolic diseases in 273,171 Thai workers in Bangkok reported that 85% of these workers were at risk of cardiovascular disease, showed the highest proportion (40%), and diabetes, with (35%) [1]. According to a data from the Bureau of Policy and Strategy, 2009, heart diseases with hypertension and cardiovascular disease ranked the third and the fourth leading causes of death in 2008 [2]. Obesity and overweight, which are the major risk factors for the metabolic diseases have high and increasing prevalence in Thailand, especially in Central Thailand (37%) and in Bangkok (36%). Healthy diet, regular physical activity and stress relaxation were suggested to prevent obesity and its unwanted consequences [3].

2. Literature Review

2.1 HBMP Based on Promise Model

To effectively prevent and control metabolic diseases in Thailand, especially in Bangkok, the behavioral and managerial model, named PROMISE Model was developed collaboratively between the National Health Security Office (NHSG) and the Behavioral Science Research Institute, Bangkok in
2008: PROMISE Model was the abbreviation for Positive Reinforcement (P), Result-Based Management (R), Optimism (O), Motivation (M), Individual or Client-Centered (I) and Self-Esteems (SE). The major characteristics of the PROMISE Model were as follows: (1) primarily aimed at modifying 3-Self behaviour which included self-efficacy (refers to a participant's belief in their own ability to perform healthy diet, regular physical activity and stress management), self-regulation (refers to the use of planning processes that activate and sustain habits, take note their own behaviors, and affects in order to attain goals of decreasing BMI, systolic blood pressure, and waistline) and self-care (refers to their skills focus health eating behavior, and physical activity and stress management). (2) Be a guidance for health professionals or individuals to develop health behavioral modification program (HBMP) and managing program aimed to enhance 3-Self behavior [4, 5]. In addition, results of this program evaluation based on CIPP Model including context, input, process and product which were collected from participants, program leaders and administrators of program leaders showed that opinions on the context, input, process, and product were at the very good level [6]. The objectives of this research were (1) to evaluate managing for HBMP of non-governmental organizations (NGOs) (2) to compare behavior change and biochemical indicators between before and after program completion, and study factors affecting program success and barrier to the program implementation.

2.2 The HBMP Evaluation Based on the CIPP Model

The evaluation model was composed of context, input, process and product, was applied to evaluate the HBMP. In addition, 360 degree feedback was also used by collecting data from NGOs administrators, program leaders, and participants. Overall conceptual framework of the program evaluation was presented in Fig. 1.

![Fig. 1 Conceptual framework of the evaluation of HBMP administration.](image-url)
3. Materials and Methods

3.1 Samples

The informants of this research consisted of 3 groups, including 8 HBMP leaders, 8 NGO administrators, and 32 client representatives. The target participants of HBMP were 3,414 people in the participating NGOs in Bangkok. The inclusion criteria for eligible participants were that: (1) they volunteer to participate in the 5-lesson program during period of 4-7 months, and (2) they were at risk of the following metabolic diseases; cardiovascular diseases, hypertension, obesity, stroke, and diabetes based on NHSO health screening questionnaire.

3.2 Settings

8 NGOs in Bangkok were funded by the National Health Security Office (NHSO), Bangkok, to conduct HBMP for changing 3-Self behaviors (self-efficacy, self-regulation and self-care) in the at risk clients. Overall, 8 programs applying PROMISE Model were implemented under the supervision by Srinakharinwirot University.

3.3 Measurement

Instruments for program evaluation were described below:

Questionnaire measuring feasibility and program success based on 4 components of CIPP Model. Responses were made on a 4-point rating scale. Respondents to this questionnaire were program leaders, administrator of program leaders, and clients. This measure was used by supervisory committee during the program supervision.

Semi-structured interviewing form about the effectiveness of HBMP applying the PROMISE Model. Indicators of program success based on CIPP Model.

Measures of 3-Self behavior. Measure of 3-Self behavior consisted of 17 items assessing self-efficacy, self-regulation, and self-care of participants. Reliability with the Cronbach’s alpha coefficients is between 0.73-0.85 and item-total correlation between 0.29-0.76. The participants were tested before and after participation in the program.

3.4 Methods

Ethics approval was obtained from Srinakharinwirot University (SWU), Thailand. The research design was evaluative research and mixed method was used as a technique to collect data. The overall research procedure was sequentially summarized as follows.

Process of evaluation of HBMP in June -November 2009. The criteria for HBMP were developed through concepts derived from a good literature review and submitted by NGOs in Bangkok metropolis for scrutiny by experts using evidence based criteria. Feedbacks were sent to program hosts for revision before a formal contract for HBMP were approved. A manual for implementation of HBMP and a manual for financial management for program leaders and staff were developed to guide implementation and management. A manual for program supervision and evaluation was also made available for use by the supervisory committee. Program leaders and staff were trained to implement the PROMISE Model. Periodic supervisions and monitoring to ensure the quality of implementation of each HBMP were undertaken. An exclusive conference on program success after completion of all programs was carried out. It was participated by the leaders and staff of each programs and also supervisory committee.

4. Results

4.1 Demographic of the Samples

Overall, most clients were female (63.24%), aged between 25-59 years (92.62%), reported high school as the highest level of education (42.53%). Regarding health risk, around half of the participants were at risk of obesity.
Effects of Health Behavioral Modification Program on Metabolic Diseases in Non-Government Organizations

4.2 Supervision and Evaluation of the Program Success Factors (Objective 1)

The results of descriptive statistics from questionnaires collected by the supervisory committee revealed that program leaders, administrators of program leaders, and clients rated good or very good level (mean 3.76, 3.76 and 3.47 respectively) of total opinion scores on the context, input, process, and product.

Factors affecting program success consisted of budget from the National Health Security Office (NHSO), high potential staff, awareness and willingness of participants, cooperation of participants, activities relevant to lifestyles of participants, provision of ongoing information, good relationship between program leaders and participants, motivation and rewards for participants.

Barriers to the program implementation included participants drop out from the program due to work load, unawareness about their health problems and insufficiency of budget.

Suggestions based on the program evaluation were: the program should be continually implemented and follow up the participants, motivate by rewards, the database program should be improved, should support enough budget, and should set change leaders and network of participants.

4.3 3-Self Behavior and Biomedical Indicators Comparison between before and after Participating in the Program (Objective 2)

The results of paired t-test for 3-Self behavior between before and after the program implementation. The paired t-test results demonstrated that after the application of the PROMISE Model: self-efficacy, self-regulation, and self-care significantly increased from the before participating in HBMP (Table 1).

The results of paired t-test for all biomedical indicators between before and after the program implementation. The paired t-test results revealed that after the application of the PROMISE Model: biomedical indicators, except waist, significantly decreased from the baseline (Table 2).

<table>
<thead>
<tr>
<th>3-Self behavior (Range 5 – 20)</th>
<th>Before</th>
<th>After</th>
<th>MD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \bar{X} )</td>
<td>S.D.</td>
<td>( \bar{X} )</td>
<td>S.D.</td>
<td></td>
</tr>
<tr>
<td>Self-efficacy (Range 5–20)</td>
<td>14.58</td>
<td>2.63</td>
<td>16.65</td>
<td>2.77</td>
<td>-2.071</td>
</tr>
<tr>
<td>Self-regulation (Range 5–20)</td>
<td>14.14</td>
<td>2.90</td>
<td>16.37</td>
<td>2.69</td>
<td>-2.227</td>
</tr>
<tr>
<td>Self-care (Range 7–28)</td>
<td>18.42</td>
<td>3.83</td>
<td>21.25</td>
<td>4.10</td>
<td>-2.831</td>
</tr>
</tbody>
</table>

* Significant at .05 level

<table>
<thead>
<tr>
<th>Biomedical indicators</th>
<th>N</th>
<th>Before</th>
<th>S.D.</th>
<th>After</th>
<th>S.D.</th>
<th>MD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>3,119</td>
<td>23.36</td>
<td>4.74</td>
<td>22.92</td>
<td>4.26</td>
<td>.440</td>
<td>16.268</td>
<td>0.000*</td>
</tr>
<tr>
<td>Systolic BP</td>
<td>2,125</td>
<td>119.44</td>
<td>17.18</td>
<td>118.99</td>
<td>15.54</td>
<td>.449</td>
<td>2.150</td>
<td>0.032*</td>
</tr>
<tr>
<td>Waist</td>
<td>494</td>
<td>33.24</td>
<td>5.05</td>
<td>32.79</td>
<td>4.746</td>
<td>.456</td>
<td>6.337</td>
<td>0.000*</td>
</tr>
</tbody>
</table>

* Significant at .05 level

5. Discussion

We were able to demonstrate that program leaders, administrator of program leaders, and clients rated good or very good level of opinion scores on the context, input, process, and product as outlined in Objective 1. This result suggested that HBMP based on PROMISE Model in Bangkok metropolis were considered successful. There were several key factors of program success. First, the support of the hospital administrators or administrators of program leaders was essential. Secondly, the enthusiasm of the staff and:
their intention to efficiently manage and deliver activity lessons for clients was considered very important. The third factor was the determination and coordination of clients. Finally, the expertise of instructors as well as the characteristic of activity lessons (e.g., clarity, easy to understand, integrated knowledge, well organized, appropriate for target group, well publicized, continually monitored and innovated) were critical elements. In addition, the activity lessons should include development of networks among clients. Regarding barriers, insufficient time to participate in the program, carelessness in health providers, the lack of powerful leader, and insufficient income of clients were perceived to be barriers for the program success.

Regarding the objective2, our results revealed that after the application of the PROMISE Model, self-efficacy, self-regulation, and self-care significantly increased from the baseline, and biomedical indicators significantly improved. These results were consistent with the results of program evaluation conducted in 2008-2009 [5] and also in line with the results of objective, indicating that HBMP based on PROMISE Model were effective in producing an increase of 3-self behavior and an improvement in biomedical indicators. Some explanations of the findings are put forward here. First, the programs were developed based on some positive psychological and managerial variables; including positive reinforcement, result-based management, optimism, motivation, individual-centered, and self-esteem which were integrated into the PROMISE Model. Second, the success may be due to changes in health behavior, particularly the increases in 3-self behavior. This was supported by previous studies suggesting that when health behavior such as healthy eating and regular exercise increased, risk factors for metabolic diseases decreased [7-10].

6. Recommendation

Health practitioners or professional interventionists, who require increases in 3-self behavior and decreases in risk factors of metabolic diseases, could apply PROMISE Model to develop HBMP. The overall model of this evaluative research and HBMP management could apply CIPP Model. The key factors and barriers for program success previously mentioned should be carefully considered when future programs are contemplated. There may be other factors affecting effectiveness of the programs, for example social support, perceived health information, reward and motivation. Thus, future research should investigate these factors. Since insufficient time to participate in the program was perceived as a main barrier to the program success, there should be studies examining determinants of participating in the HBMP among participants having different demographic data.

7. Conclusion

The HBMP based on PROMISE Model conducted by the participating organizations were considered successful and effective at producing an increase in HBMPs and an improvement in biomedicine indicators.

Acknowledgments

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